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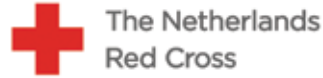
World Disasters Report

Focus on culture and risk

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Cover photo: *Culture affects how people perceive risk and behave in relation to it; it therefore needs to be at the centre of disaster risk reduction and climate change adaptation activities. Culture includes people's beliefs, behaviours, traditions and social structures. Johnson Ugede's medical 'culture' encompasses both 'modern' and 'traditional' healthcare. The 62-year-old Nigerian fights headaches and fevers with local plants, but sleeps under an insecticide-treated bed net to protect himself from mosquitoes and, thus, malaria.*

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World Disasters Report 2014

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Culture and risk

This year, the *World Disasters Report* takes on a challenging theme that looks at different aspects of how culture affects disaster risk reduction (DRR) and how disasters and risk influence culture. The report asks, for example, what should be done when people blame a flood on an angry goddess (River Kosi, India, in 2008) or a volcanic eruption on the mountain god (Mount Merapi). After the tsunami in 2004, many people in Aceh (Indonesia) believed that Allah had punished them for allowing tourism or drilling for oil, and similar beliefs were widespread in the United States regarding Hurricane Katrina, showing God's displeasure with aspects of the behaviour of the people who live in or visit New Orleans.

Most people who live in places that are exposed to serious hazards are aware of the risks they face, including earthquakes, tropical cyclones, tsunami, volcanic eruptions, floods, landslides and droughts. Yet they still live there because, to earn their living, they need to or have no alternative. Coasts and rivers are good for fishing and farming; valley and volcanic soils are very fertile; drought alternates with good farming or herding. Culture and beliefs, for example, in spirits or gods, or simple fatalism, enable people to live with risks and make sense of their lives in dangerous places. Sometimes, though, unequal power relations are also part of culture, and those who have little influence must inevitably cope with threatening environments.

Together with other organizations that engage in DRR, we in the Red Cross Red Crescent know about people's beliefs and cultures and their different interpretations of risk. However, we find it challenging to fit these seamlessly into our organizational framework and funding models. Instead we tend to assume (or hope) that the people we want to support use the same logic and rationality as we do and that they will want to reduce the disaster risk. Sometimes there is also an institutional reluctance to deal with the issues of inequality and power that make people vulnerable in the places where they make a living.

The one thing that is certain is that we will have less sustained impact if we do not adequately take account of people's cultures, beliefs and attitudes in relation to risk. With climate change leading to damaged livelihoods, and therefore more vulnerability, and making hazards more extreme and/or frequent, we have to get this right.

One important goal of this edition of the *World Disasters Report* is to bring these complex issues and clashes of cultures into the open for discussion, so that they can be much better incorporated into DRR work. The first part (Chapter 2) assesses the effects of religion and other beliefs. The next chapters (3 and 4) examine the culture of DRR organizations, showing that we are all subject to beliefs and attitudes that frame our outlooks on risk and what should be done about them. It asks why DRR actors and organizations persist in giving priority to severe hazards when they know

that most people do not mention them when asked what risks they face. It is difficult for most people to be concerned about occasional and unpredictable severe events (or climate change) when many of their problems are 'development' needs that have not been fulfilled. Fortunately, the need for convergence between DRR and development is part of the discussions of the successors to the Hyogo Framework for Action and the Millennium Development Goals. This *World Disasters Report* also explains how DRR must take account of all the causes of vulnerability – including cultural ones – as the starting point for risk reduction.

After this discussion of 'organizational culture' (including a challenge to the widespread faith that many have in doing things that are 'community based' in Chapter 4), the report assesses how to overcome these barriers for more successful disaster preparedness. This is done first in the context of how traditional cultures can help with shelter and housing (Chapter 5) and also in health and medicine (Chapter 6). These are all areas in which the Red Cross Red Crescent has immense experience and has shown leadership in recent decades.

The final chapter asks what needs to happen next, how to take account of culture for DRR and also the need to build awareness of how 'organizational culture' has to change, for example, by not assuming that the people we are supporting are 'irrational' but instead accepting that they have different rationalities. It begins the process in which we all need to develop new ways of thinking and acting for DRR so that our organizations have a much better alignment with the way people think and act.

This publication does not provide all the answers to these complex issues, which vary a great deal around the world. But it shows where the starting points are. It gives some indications of the direction in which we need to go and draws on examples of good integration of traditional and 'modern' ideas for achieving effective vulnerability reduction. Recognizing the significance of the different ways of believing and behaving will increase the effectiveness of DRR and development initiatives generally and pave the way for greater impact in our responses to the challenges stemming from climate change.



Elhadj As Sy
Secretary General



The links between culture and risk

When Hurricane Katrina struck the United States of America in 2005, several politicians (Spencer, 2005, gives an example) and a significant number of those affected believed it was God's punishment for sinful behaviour in New Orleans (Stephens et al., 2013). Some Japanese have blamed gods for the 2011 earthquake and tsunami, and others consider that traditional culture (for example, deference and subordination to authority) was a factor that led to the meltdown of the damaged Fukushima reactors (see Box 2.4). In West Africa, Mount Cameroon is a volcano that erupts every few years. One village chief reflected many people's beliefs in saying: "When the Mountain God gets angry it causes eruptions. We don't prepare for these eruptions because we can calm the God's anger by making a sacrifice... When the lava flows towards the sea, it is the Mountain God communicating with the Sea God" (Brewer, 2013). There are similar stories among indigenous people who live on volcanoes in Latin America (Fainaru, 1997) and in Indonesia (see Box 2.3 on Mount Merapi). In all these cases, disaster prevention activities encountered difficulties, with, for example, people resisting evacuation after warnings.

Around the world, a majority of people are likely to have at least a partial perception and response to risk that is based on their culture. In Miami, three senior politicians refuse to take action to protect the city from storms and sea-level rise because their culture leads them to deny that climate change is happening (McKie, 2014). The British prime minister appointed Owen Paterson, a climate change 'denier', as environment minister from 2012 to 2014 (Carrington, 2014), demonstrating a culture embedded in power that refuses to accept scientific evidence. This mix of cultural perceptions of risk from many different countries shows that there is no simple division between a rational scientific 'western' outlook and 'strange' beliefs in other parts of the world. Examples of alternative types of reasoning about risk that relate to people's culture can be found everywhere. An interesting case is that of the Torres Islands in the South Pacific nation of Vanuatu, where the people are aware of hazards like tsunamis. Before Christian missionaries arrived, they blamed these disasters on 'black magic' (Ballu et al., 2011). To avoid the risks, they built homes inland and 100 metres above sea level. However, with conversion to Christianity, the culture shifted and people no longer blamed black magic for the disasters, and moved their homes into the danger zone on the coast.

Why do people perceive and deal with risk in these ways? And why do the organizations that set out to prepare for and respond to disasters largely ignore what could be called the people's risk culture? This *World Disasters Report 2014*

Teenage boys fishing on a river in south-west Bangladesh, in an area which was hit by two serious cyclones in 2007 and 2009. The people also suffer the effects of water salinization and land poverty.
© Terry Cannon

considers risks related to natural hazards that trigger disasters. As will be seen, even the way that risk is defined is linked to culture, so that people and organizations that are involved in disaster risk reduction (DRR) may disagree how they should act in relation to risk. Those organizations often assume that people want to take action about serious hazards, using the same logic that they use. The organizations consider themselves to be rational and scientific in their outlook and that it is clearly everyone's priority to minimize those risks. But it is much more complex than this and, although most DRR organizations will admit to this complexity, it is not always apparent that they do much about it in practice.

Climate change and its connection with extreme events and rising vulnerability are of increasing significance, and so must also be linked to understanding the significance of culture. Climate change is included because it is now impossible to separate DRR from the efforts that need to be made for adaptation (IPCC, 2012). Global warming is driving increased frequency and/or severity of climate-related hazards. And climate trends (in rainfall, temperature and irregularity) are damaging livelihoods of hundreds of millions of people. This is making more people poor and vulnerable to all hazards (including those not related to climate). The report does not cover climate change in any detail: the point being made is that disasters are related to it and, therefore, it is essential to integrate DRR with adaptation and consider culture in relation to both. The hope is that DRR will be better integrated with adaptation in the follow-up to the Hyogo Framework for Action and the Millennium Development Goals.

Why culture?

This report asks why culture is not considered more central to disaster risk reduction. Looking at different ways that culture matters, it assesses how those who are interested in DRR can incorporate culture and, by doing so, improve its effectiveness. The interaction between culture and risk relates to many aspects of human and institutional behaviour, including religious and related beliefs (Chapter 2), livelihood needs and different perceptions of risk (Chapter 3), connections with others in 'communities' and the significance of power relations in determining risk and defining culture (Chapter 4), where people live and the effects of culture on type of house and construction methods (Chapter 5), and attitude and beliefs of both people and organizations about disease and health (Chapter 6). Culture may be expressed in many ways in relation to risk, ranging from folk songs and dance, prayers and religious practices, to whether or not someone signs up to receive warnings of cyclones on their mobile phone. The focus here is specifically on natural hazards, disease and climate change (where there should be integration with DRR to support vulnerability reduction). Apart from the chapters on shelter, construction and health, the emphasis is on disaster preparedness rather than response and reconstruction, although readers will realize that much of what is discussed is also relevant in the post-disaster context.

sometimes have a different definition of risk from those of the people affected. *The World Disasters Report 2014*, therefore, defines culture specifically in relation to the issues of risk and how risk can be differently perceived:

“Culture consists of beliefs, attitudes, values and their associated behaviours, that are shared by a significant number of people in hazard-affected places. Culture in relation to risk refers to the ways that people interpret and live with risk, and how their perceptions, attitudes and behaviour influence their vulnerability to hazards.”

Beliefs and attitudes lead to particular ways of perceiving risk; values affect how people prioritize risks and how they relate to other people when dealing with risks; behaviours are the outcome of the perception and values that relate to risk. This is all rooted in the ways that people interact with each other and with organizations in the context of power relations. Culture is not a ‘set of things’ that is like a list of rules, nor is it forever fixed and unchanging. But the key issue in relation to risk is that culture operates in particular ways that affect people in their norms and assumptions about daily routines and practices. These are partly learned from parents and elders and the wider circle of peers, through education and the media.

The reason it is important to look at and understand culture is that a lot of it is related to hazards: culture often embodies beliefs about risk, attitudes and values about what priorities should be and what action people should take in relation to risk. Understanding culture is, therefore, highly relevant to how disaster preparedness and climate adaptation is carried out. For example, what should DRR organizations do when people in north Bihar (India) who suffered a devastating flood of the River Kosi in 2008 believe that they were being punished by the goddess Kosi for their bad behaviour? Many of the people think they must pray more and make offerings to the goddess, who was supposedly displeased with them (Crabtree, 2010). This is not to argue for a crude version of culture that assumes that praying is all that people will do: the concern here is that many organizations largely ignore cultural interpretations of risk and disaster. If such beliefs and responses are not taken into account, people’s willingness to support other forms of disaster preparedness is likely to be constrained.

Culture also matters in the context of risk because it can both increase and reduce vulnerability. It also strongly affects the response and recovery process. Different cultural perspectives on hazards and how to respond to them may provide lessons that can be applied in other places. This report presents two dimensions of culture and risk. The main emphasis is on how culture is a (neglected) factor that increases vulnerability to hazards, because it influences people to think and behave in ways that increases their exposure. The second dimension looks at ways that culture can help to reduce vulnerability, for example, through safe construction methods or by influencing responses to disasters, and how it can be possible for outside organizations to work with culture to integrate it into DRR and adaptation to climate change.

The significance of ‘culture’ must be understood and incorporated into any attempt to deal with natural hazards and climate change, rather than being treated as largely irrelevant. No matter how awkward or difficult, culture cannot be wished away and must not be ignored. Culture is part of the basis of how people will respond to any initiative for DRR and adaptation. Beliefs and the related perceptions of risks are likely to be specific to places that experience particular hazards and shared by many of the local people. The attitude to risks is often connected with the livelihood activities people engage in, to help justify why people make their living in dangerous places (Chapter 3). These ‘risk cultures’ enable people to live with danger and can include religious beliefs and related activities (see Bankoff, 2013, for a European example). Often, these attitudes prioritize Nature when people consider themselves to be closely linked with it, and disasters may be explained by seeing god(s) as Nature’s agent.

Ways of dealing with risk may include adherence to group attitudes that people cannot easily avoid without creating significant conflict with others they live among. Culture is about ‘belonging’ and being part of a shared experience of life. For many people, that includes the spiritual forces that are believed to affect it. Breaking with beliefs that form part of the group behaviour can risk being excluded from that group and the ‘social capital’ that goes with it; and that is crucial to all other aspects of life (see What is a livelihood? in Chapter 3). Such peer-affected behaviour can include gendered attitudes to risk, such as that linked to ‘machismo’, where men behave as if taking a risk seriously is a sign of weakness (see Box 1.1 on road safety). Gender differences exist in attitudes to risk by men and women, as for instance in higher male mortality in relation to flooded roads: in Australia and the United States, men appear to be willing to drive into water without knowing how deep it is and die more frequently than women (Ripley, 2008; FitzGerald, 2010). It has also been noted in some DRR initiatives when men from one household are unwilling to take up a disaster risk-avoidance action because they do not want to appear different or ‘weak’ in comparison with the rest of the group.

BOX 1.1 Road safety and seat belts – a personal story

There are many types of risk, and the ways that culture interacts with them are often evident, for example with road safety. This is pertinent, since in many ways death and injury on the world’s roads are far worse than those caused by natural hazards (see Figure 1.2). Globally, more than 1.2 million people die on the roads every year, many of them pedestrians (WHO, 2009). Whenever people travel on the roads, it is evident that culture plays a role in how safe they are. These are some illustrations from my personal experiences of why culture is relevant.

Some years ago while out in the countryside on fieldwork in India, I found myself having to travel back to the city in a Land Rover as night was falling. The bank official who was taking me to his rural branches for my

study of rural credit took over from the driver, saying that he would drive us back to the city. His style of driving made me nervous – he had only one hand gripping just the centre of the steering wheel, with no effective control over the vehicle. There were no seat belts, although these would not help pedestrians or others. We were travelling on narrow country roads, often raised up and with a drop on both sides, and sharing it with people, cows and goats who were wandering all over the place. This worried me – we had at least two hours of travel like this. So after careful thought I mentioned to my host that I would feel a lot safer if he would drive with both hands on the wheel. He said he was happy to do that if it made me feel better, but he asked why. I explained again that it would enable him to have better control of the vehicle and, therefore, reduce the risk of an accident. He said that if we were going to crash it would happen anyway, whatever way he drove. But, I said, you are an engineer and you know that if you want to put up a bridge you use the formulae and if you use the right materials it will stay up. Yes, he said that is true, but if we are going to crash we will anyway, it's our destiny.

New Delhi a few years later, and a law had been introduced for wearing seat belts. I got in a taxi and was absolutely astonished to see the driver put his seat belt on (the one in the back for me did not work). "May I ask why you are doing that?" I said, to which he replied that if the police saw him without it he would have to pay a 'fine' (we both knew what he meant). So a seat belt is not for safety, but to avoid paying money. Soon after I visited a leading DRR organization in Geneva, and got a ride across the city with a senior staff member who does not wear his seat belt, despite being a disaster specialist. I managed to refrain from asking whether he had any problem in issuing advice to people about how to prepare for risk in other countries. On another trip I was in China, where it is estimated that more than 200,000 people die each year on the roads. I shared a car with some government officials, who did not wear their seat belts. I found this interesting and they explained that, as they were senior staff, the law on wearing them did not apply when they were on official business.

Many years ago, laws on seat belts were introduced in high-income countries. In the United Kingdom when they were first fitted into cars there was not yet a law to make people wear them. When travelling in a car with others, I would put on the belt, but some male drivers would demand to know if I thought they were not capable of driving properly. It was just about acceptable to say that I was not worried about them, but all the other drivers on the road. Even today, some of the men from the local taxi company (all from different ethnic minorities) do not wear seat belts when they drive me places. They, too, think I am questioning their manhood if I suggest it is a good idea to use them. The risk they take is significant, as they would probably lose their taxi licence if caught and, therefore, their livelihood. In the UK, men being willing to wear seat belts was reputed to have increased significantly after 1973 – not because of the law, but because Gordon Banks (the English football team's goalkeeper) went through his car's windscreen in a crash and lost an eye. This ended his career as one of the best goalkeepers ever known.

There are a number of reasons people say they do not want to wear seat belts. It has even been argued that it increases risks of accidents, because it may encourage drivers who feel safer wearing the belt to take more risks and drive more dangerously. Others oppose it because they consider it wrong that the state should dictate personal behaviour, and it is up to the car occupants to make their own decision. A few claim they are worried about an accident in which they roll off the road and into water, and cannot escape. The number of accidents in which this happens is tiny compared with other outcomes, and this objection also shows the difficulty many people have to judge relative risk.

So for something as supposedly 'simple' as wearing a seat belt or taking reasonable preventive measures to increase safety (two hands on the wheel), there is a whole range of factors that are cultural, gendered, emotional, psychological, personality and political. Culture here is in the form of religious beliefs concerning human destiny and male attitudes to risk that arise from patriarchy and gender attitudes. Psychology enters the equation when people cannot judge relative risk or have a 'personal' preference linked to their emotive and political response to refuse to be told what to do. It is not really known from the science how much this is socially determined and how much is related to the functioning of the mind in different neurological conditions (evidence shows that some people are much more willing to take risks). What can be derived from this is that if there is this level of complexity around seat belts and risk, how much more do culture, religion, gender attitudes, psychology, emotions, personality and politics need to be taken into account when trying to understand people's attitudes to much bigger risks. ■

Whose culture? People and organizations

The culture involved in risk is not just that of the people who are supposed to benefit from risk reduction and adaptation, but also the culture of the relevant organizations. So the report is assessing the significance of two types of culture: of the people who are vulnerable to disasters ('people's culture') and of the organizations themselves ('organizational culture'). The report also examines how these two cultures clash, reducing the effectiveness of risk reduction and adaptation to climate change. It does not assume that disaster preparedness and adaptation are carried out only by organizations that arrive 'from outside': people also engage in their own risk reduction and ('autonomous') adaptation activities. But the focus here is on the interaction of people at the grass roots with the organizations that aim to support them and the significance of the different beliefs and behaviours.

When organizations are engaged in disaster preparedness, they need to ensure that their own definition of problems and solutions will fit with the cultures, lives and risk behaviours of the people they intend to help. Culture is inherent in how everybody thinks and acts and is therefore integral to all aspects of human existence. It is especially relevant to the ways that most people perceive and live with risks, because most cultures have something to say about them. Where culture is recognized by DRR and adaptation organizations, the tendency is to focus on that of the people they are working with – the 'people's culture'. It is vitally important to understand how people put values on different aspects of their lives, assign priorities and find ways of living that enable them to live with hazards. The report proposes that it is also essential to understand the cultures of the organizations themselves; this is explored in greater detail in the following chapters.

No one is 'immune' from culture, including the organizations that do disaster risk reduction and climate change adaptation and provide emergency aid. The organizations need to recognize that they have a culture of working and hold a view about disasters and risk that may not be the same as those of the people they intend to

help. For example, dozens of projects on climate change around the Pacific have failed simply because the communicators did not attempt to take the local culture into account. Key concepts were used in a language that was unfamiliar to the people. Even something as apparently simple as the fact that the outsiders spoke while standing up when everyone else was sitting had a negative effect (Nunn, 2009). Understanding people's culture is clearly crucial even to get the message across.

Culture as a dynamic system

The report does not assume that culture is a 'thing' that is fixed and constant – cultures are changing all the time (more or less rapidly) depending on the types of influences that affect them. Culture is not a set 'menu' of what people have to do or believe in, although there is often peer pressure to follow some norms of behaviour. But even these expectations can be altered by influences from outside a particular locality (e.g., fashion, new technology, changing economic incentives, resistance or acceptance of external interference). Culture is more of a system that interacts with its social and natural environment. A culture interacts with other cultures, and this can weaken or reinforce either or both. Interaction can also happen between generations, sometimes involving younger people (who may adopt outside ideas more readily) resisting their elders or choosing to revere other icons than those of their cultural origins (ranging from pop stars to extremist groups). Any culture is part of a perpetual series of negotiations between the different social groups. This includes:

- Tensions between age groups and generations: for instance what is acceptable to elders and younger people can diverge
- Formal education, especially when it includes science and the explanations of risk
- Interactions between different ethnic or religious groups that share the same locations: this can produce 'hybrid' cultures
- Conflict between groups (including religious or ethnic) that reinforces in-group behaviour to be a more rigid, intolerant and 'extreme' form of that culture. This may increase the level of violence, such as in Myanmar, Northern Ireland and Sri Lanka
- Interaction and conflict between insider (the reference group for the culture being considered) and outsider groups
- Imposed or power-related practices or cultures, including those that affect people through colonization or globalization and mass media; for example, all over the world people have adopted new religions or integrated them with their own (syncretism)
- People's cultural practices (e.g., dances and costumes) can end up being performed only for tourists and their internal value to the people largely eroded.

There are examples of most of these types of interaction in the following chapters. Box 1.2 on Sri Lanka illustrates a number of these dynamic and conflicting aspects,

showing also the difficulties of rival cultures (and livelihood perspectives) in disaster relief and recovery.

For culture in relation to risk, the key issue is when culture becomes ‘activated’ as a significant factor in people’s behaviour and in the interaction that goes on between insider and outsider. Culture can be the way that ‘inside’ people express opposition to what they consider is an external imposition. For instance, cultural practices that prevent risk reduction may become reinforced and exaggerated when people feel threatened by different ways of doing things that arrive from outside. This can have a negative effect on behaviour in relation to health campaigns, when people oppose treatments or preventive measures, as discussed below. This is especially relevant where the outside organization has different values and beliefs from those of the ‘insider’ people. The fact that culture evolves gives some hope to finding ways to reduce the ways that people’s beliefs and behaviour can make it difficult to achieve DRR and adaptation. Chapter 7 provides some guidance on how to manage this interaction as effectively as possible and draws on examples where good practice has emerged.

Even when it is acknowledged that culture must be taken more seriously, this is not easy. Culture is complex and difficult to understand. This is often precisely because those who are trying to understand it are from outside and, therefore, unable to comprehend it as a lived experience. But there are also inherent challenges in trying to analyse or be objective about organizational DRR culture. It is difficult for people in those organizations to have self-awareness of their beliefs and assumptions, the framings and logics. Understanding that culture forms an important part of any context where DRR and adaptation activities may be applied is relevant for both the organization and the people they are trying to help.

Much anthropology research exists on the role of culture in relation to disasters, but it has had little impact on mainstream organizations. Although they have mainly focused on high-income countries, psychology and risk perception and behavioural economics have also largely been ignored, despite their relevance and relationship to culture. These have demonstrated very significant false assumptions about ‘rationality’ in people’s everyday economic and risk-related behaviour. The theme of the World Bank’s *World Development Report* this year is ‘Mind and mindset’ (World Bank, 2014). It draws heavily on behavioural economics and psychology to show how many of the traditional assumptions made in mainstream economics are wrong or misleading. There is a growing knowledge of how people are in denial of climate change in relation to risk perception, psychology and culture (Hulme, 2009; Norgaard, 2011). Some of this shows the paradox that more scientific information is unlikely to change people’s minds and that it can actually reinforce their denial because their viewpoint is related to culture and an emotional attachment to a peer group that for them is more important than scientific knowledge.

BOX 1.2 Sri Lanka's ethnic groups and the tsunami aid disaster:
a lesson for maintaining the peace?

With a long-standing conflict in the past, Sri Lanka has entered a phase of rapid economic growth. In spite of its new-found peace, there are still serious issues of governance and ethnic-based rivalries within Sri Lankan communities. These limit the opportunities for inclusive development, including for reducing disaster risk, adapting to climate change and preventing crisis. Ten years after the 2004 Indian Ocean tsunami, lessons are still to be learned. Although the immediate response brought temporary peace, new conflicts arose that both harmed recovery and worsened divisions between ethnicities and the governing forces of the island. International media hailed the tsunami as a possible trigger for reconciliation, but the result was almost the opposite. The parties involved failed to understand influences on relations between localities and governing forces, and ethnic divisions within communities themselves.

The tsunami happened during a ceasefire in Sri Lanka's decades-long civil war, and led to a shift in the conflict that directly affected the peace process. The massive number of tsunami casualties across the island caused the forces of both the Liberation Tigers of Tamil Eelam (known as the LTTE, an armed group fighting for a separate Tamil territory within Sri Lanka) and the formal government of Sri Lanka to pause in fighting and turn their manpower to response and recovery. The impact of the tsunami was worst on eastern shores, which at the time were hosting many war-affected people displaced from their homes.

Within days of the tsunami, the government declared Sri Lanka to be in a 'state of emergency', noting that tsunami responses would be extended to all of Sri Lanka and aid agencies would have access through checkpoints to areas previously inaccessible due to the conflict. This access was short lived, as accusations from both the government and the LTTE emerged over aid obstruction and corruption. National-level discord was mirrored at the local level, as communities felt that aid was not being dispersed fairly between different ethnic groups. These fears were reinforced by land seizures based on national-level decisions. The president set new 'boundary zone' regulations with the aim of reducing risk of future coastal hazards. But exceptions were made to allow for the construction of hotels in buffer-zone areas, while people who had to live by the sea for their livelihoods were moved inland. Accusations were made that the policy was another form of resource grabbing by the government. The regulations displaced some of the most vulnerable members of different communities already affected by the conflict. Any hopes that disaster response could bring some cooperation between ethnicities were quickly dashed as tsunami relief unravelled over entrenched issues of trust.

Going outside formal channels, the LTTE presented themselves directly to donors as viable authorities for distributing assistance to people within the territory under their control. The government reacted by restricting the aid going to conflict regions and this damaged their relations with both the LTTE and international organizations. People in LTTE-controlled areas or on the borders of conflict areas thus received the least external assistance. They were already the most vulnerable due to a lack of resources and included many who were also the most affected by the tsunami. The LTTE capitalized on this by blaming the lack of assistance on the government. As a result, there was an increase in violent conflict, an erosion of the rights of conflict-affected people and, just three years after the tsunami, the already-fragile ceasefire was formally declared over.

By May 2009 when government forces occupied the remaining areas controlled by the LTTE, most of the southern and western areas of the country affected by the tsunami had already moved on financially and physically. By contrast, post-conflict people also hit by the tsunami were left weak and fragmented with a lack of access to resources to rebuild sustainable livelihoods and infrastructure. Still today, many former LTTE areas continue to be militarized, chronically poor and highly vulnerable to climate change and disaster risks. They are left without the assets necessary to recover from hazards, let alone to plan for the future. To these communities, Sri Lanka's conflict remains a major factor in the area's political, social and economic fabric, just as it has been for decades.

Aid in these regions often fails to recognize or use informal influences and information channels that are people's normal practices or relationships. In spite of strong institutional foundations for risk reduction, there is little knowledge of how people's vulnerability is connected to their ethnicity, economic standing and local influence. There is potential for risk reduction to be integrated into development in communities in the north as it has been done in central areas of Sri Lanka, but this needs to be coordinated with the building of cultural resources. These need to include accessible social networks to be harnessed by local-level governance strategies. As more permanent settlements are established, knowledge of local influence and trust needs to be spread. Crucially, in some post-conflict areas, the development of community identity beyond ethnicity has meant that some families feel ready to invest again in their surroundings, including in building homes and participating in local risk reduction activities.

Such social resources should be included in assessments of vulnerability and capacity in order to understand potential challenges and opportunities for the effectiveness of DRR efforts, so that a prevention culture can be supported that is sensitive to local contexts and does not increase marginalization. Sri Lanka's people may use risk reduction not only as an objective in itself, but also as a means to a sustainable and equitable peace. This could demonstrate how local-level actions potentially have significant national impacts. People affected by the tsunami who were also affected by the conflict have an interest in finding ways to use DRR to support peace. After the tsunami, government actors were often mistrusted. But local risk reduction efforts are now being seen as real ways that the government is investing in communities. This could lead to more trust in leadership and, after a generation, perhaps a lasting peace. ■

Culture and links to power systems

Culture can be a significant factor in creating the higher levels of vulnerability of some groups of people, especially where beliefs and behaviours are embedded in power systems that allocate risk unequally between different groups of people (see Chapter 4). Culture itself can enable some people and groups to have more power: it 'normalizes' and legitimizes particular attitudes and behaviours that lead to vulnerability. This is very evident in relation to gender. In almost all cultures, women and girls are relatively less powerful and often materially deprived, and this is a significant factor in making females more vulnerable to some types of hazards.

In some cultures, the people who are disadvantaged by such 'cultures of power' (e.g., landless people, minorities, low class and low-caste groups as well as females) may 'accept' their position and perceive it as being legitimate because

it is regarded as cultural rather than exploitative. For example, a flood project in Cambodia run by an international non-governmental organization (NGO) had considerable difficulties in dealing with the tensions between groups in a village. The villagers believed in reincarnation. Some refused to accept the need to help those who had been badly affected: they were being punished for what they had done in a previous existence and so it would be wrong to help (Williams, 2003). On a much larger scale, the significance of caste was clearly evident as a factor in the vulnerability-discriminatory aid and recovery after the Bhuj earthquake in India in 2001 (DEC, 2001). Similar problems were manifest for the Buraku, an 'outcaste' group, in Japan after the 1995 Kobe earthquake (for both their initial vulnerability and the discriminatory response) (Wisner et al., 2004; McGill, 2011).

In some situations the oppressed may rebel or resist. Many outcaste people (the 'untouchables') in India converted to Islam or Christianity to 'escape' the cultural assumption that they deserve to suffer. In recent decades, many have supported the Dalit political movement against the caste system, which is largely an integral part of Hinduism. Culture, in the form of caste status, gender and other beliefs that affect access to resources, remains a significant determinant of both vulnerability to risk and access to aid and resources for reconstruction after a disaster. In many countries, youth cultures and 'counter-culture' groups (the clue is in the name) are seen as forms of resistance against power systems that embody oppressive cultures, as have struggles against racism and for rights for women, the disabled and people with different sexual orientations.

Information as a false hope for behaviour change: lessons from public health

Another significant area of work that has had very little impact on DRR thinking is that on public health. Culture is highly relevant in relation to risk perception for disease and other public health issues (see Chapter 6). Problems where culture is very significant include nutrition, child vaccination and the continued widespread denial of a 'germ theory of disease' (where instead people invoke bad spirits or curses as the cause of illness). In Ghana, the Red Cross has had some success in a campaign to promote hand-washing, especially at events like funerals where the risk of disease transmission is increased among the many people who attend (IFRC, 2012). Interestingly, it might be expected that western doctors would fully accept the 'germ theory', and yet a report into unnecessary deaths in United States hospitals (estimated to number between 44,000 and 98,000 every year) suggests that many medical staff do not. Cross-infections between patients account for a significant share of those deaths, which could be prevented by more frequent hand washing (Levitt and Dubner, 2009).

Some disease eradication programmes are affected by ‘cultures of resistance’ against supposed western interference. This has been very relevant for explanations of AIDS in South Africa (see the review by Mackintosh, 2009) and is currently blocking polio vaccination campaigns in Nigeria and Pakistan, where powerful local leaders and terrorist groups are killing vaccinators and saying the campaign is a western population-control plot. In north Nigeria some local people are concerned about the vaccination programme because of local ‘non-germ’ explanations for the disease and suspicion of government (IRIN, 2013). Suspicion of the role of government in health matters led to massive opposition to ‘Obamacare’ (the Affordable Care Act, 2010) in the United States, even among many people who would benefit from it. Some research suggested that race played a part and even that some opponents feared that “American culture and way of life” was being threatened by foreign influences (meaning state-run health systems) (see a survey of research by Waldman, 2014).

The spread of Ebola disease from February 2014 in West Africa is partly a result of a culture clash in how to deal with the dead and of some local people’s suspicion of outsiders’ theories about the illness. Local traditions in Guinea and Sierra Leone involve washing the dead, whereas the medical practices aimed at stopping the spread of Ebola require quarantine of those infected, both when they are alive and, if they die, because they remain infectious (Global Ministries, 2014). In Sierra Leone, the Red Cross has formed a specialist burial team that helps bridge the cultural gap by respecting local beliefs while providing quarantine safety (IFRC, 2014).

Knowledge without an understanding of culture is not enough

DRR organizations have not taken up one of the clear lessons from many public health and preventive medicine initiatives. This is that people do not necessarily change their behaviour simply because they receive information. There have been some significant advances in some health campaigns that do relate to campaigns and information being made available, as for example with smoking and in mass childhood vaccinations across many different cultures. But it is not always effective, and people always interpret information through their own cultural lens, especially when local culture becomes a form of resistance against what is perceived as outside interference.

There are serious doubts about the validity of the idea that providing information changes people’s behaviour in the direction of risk reduction, as for example in the standard ‘knowledge, attitudes, behaviour’ (KAB) model and ‘information deficit model’ (see Chapter 3). This has significance for DRR and adaptation

The Leyte chapter of the Philippine Red Cross was affected by Typhoon Haiyan in November 2013. All over the world, some people, of diverse beliefs and religions, believe that disasters are a punishment from their gods or spirits.
© Jarkko Mikkonen/
Finnish Red Cross



programmes. Although people who experience a disaster are more likely to take action in relation to a repeat of the relevant hazard, providing information about known hazards that may strike people is often not a basis for mobilizing people to take part in preparedness.

Even experiencing a disaster often does not always promote sufficient action. The famous 'window of opportunity' for change after a disaster is rarely open for long and lessons are not learned with any consistency. Many people continue to be adversely affected by natural hazards on a recurring basis and, to outsiders, do not appear to 'learn'. So if people have often dealt with risk, but do not appear to 'learn', perhaps much more significance needs to be given to factors that are not knowledge-related. Culture shapes how knowledge and understanding of risk is (or is not) applied and interpreted. The report finds that culture can be a significant factor that can increase people's vulnerability to natural hazards, including when people view risk through their culture and not on the basis of information.

The ways that people's culture contrasts with DRR rationalities is most evident when people give lower priority to risks that outsiders regard as serious. This may be partly because people consider that they have minimal ability to do much about those risks. And in any case other important factors override conventional notions of risk. DRR and adaptation organizations acknowledge that people knowingly live in areas that will experience serious hazards and, although many are forced to live in danger

by poverty, many others exercise substantial choice in doing so. The significance of place and emotional attachments to it are well understood in the anthropology and geography literature (see Chapter 3). People enable themselves to live with risk through the evolution of cultures that either make them feel safe or remove the causes of disasters to a different realm (often religious) that is acceptable because it requires no other explanation.

After some disasters, many people may want to move back to the same location even when many have died, homes have been destroyed and the hazard may happen again (Oliver-Smith, 1979; 1986). This poses a number of problems for DRR and adaptation. Most seriously, it calls into question the underlying logic of interventions that assume that, when given sufficient knowledge and awareness, people would not live in 'risky' areas. It also ignores the fact that most people prefer known to unknown risks. They would rather face natural hazards in one location than the possibility of loss of reciprocity from neighbours and community, lack of employment or livelihood options, physical violence or crime in a new 'safe' place. People who want to return feel that they can be more in control, that the variables they have to deal with are known to them and that they can make responses within an existing framework of experiences. This makes it very difficult for DRR organizations, as it would mean that improving people's security requires persuading them to act against what they think are their own interests, or denying their culture or psychological preferences.

It is in the study of anthropology and sociology of risk that the emergence of the relevance of culture can be seen. Surprisingly this knowledge has had little impact on organizations that deal with disaster and adaptation. Much of this research has focused on high-income 'western' countries (e.g., Beck, 1992; 1999; Giddens, 1991; Douglas and Wildavsky, 1982; Lupton, 1999; 2013 provide good summaries). Many of their ideas relate to the changing character of risks that result from modernity and the shift away from Nature as the primary 'threat' towards risks such as technology failures, pollution and terrorism that arise from industry, conflict and globalization. Caplan (2000) suggests that this involves people dealing with increasing uncertainty, because faith in science is undermined and risks are 'global' with the possibility of remote events having an impact over very great distances. Global warming would now be recognized as the primary example of this, although it was a less prominent topic when these authors were writing.

But there are also significant anthropological approaches to risk and culture on 'traditional' societies and low- and middle-income countries (Caplan, 2000) that have also had little impact on DRR and adaptation. A key issue for much of this is analysis of the ways that people in different societies choose to define what is considered to be a risk and how these choices are shaped. Culture affects this social construction of risk, but culture itself is also shaped by how people believe

they can (and cannot) deal with different types of threat. Some of Douglas and Wildavsky's views are summarized usefully by Caplan (2000) in a way that is highly relevant for this *World Disasters Report*:

“People see the weight of risks differently, and have to prioritise between them, since plainly no one can worry about all potential risks all the time. But in order to rank dangers there must be some agreement on criteria, which is why acceptability of risk is always a political issue. Since there are no value-free processes for choosing between risky alternatives, the search for an ‘objective method’ is doomed to failure and may blind researchers, including scientists, to the value-laden assumptions they are making.”

She goes on to show how Douglas and Wildavsky argue that “... people who adhere to similar forms of social organization take or avoid similar kinds of risks, and that for this reason, it is only by changing the social organisation that risk selection and perception can be altered” (Caplan, 2000). It would be difficult to put the case for the significance of culture and its interaction with risk more clearly.

Is behaviour only cultural or also ‘personal’?

Culture is a neglected but practical entry point for understanding much behaviour by institutions and people. By definition it affects many people together, and so lends itself to possible group-based or policy-led initiatives. But one of the criticisms made of Douglas and Wildavsky is that they overemphasize the social construction of risk. For the critics, this makes it difficult to allow for a person to ‘make up their own mind’ rather than be constrained by culture. Can people perceive and respond to risks on grounds that are not entirely determined by culture? The possible significance of an individual’s personality and of psychology and genetic make-up is also largely ignored by DRR and adaptation organizations. This is in spite of widespread awareness of the significance of these factors for understanding risk in (mainly) western societies.

There is little space here to elaborate on this, but it must be acknowledged that ‘culture’ is not the complete story and that other factors, which are currently missing from disaster preparedness and adaptation, must be considered. Not all people’s behaviour, attitudes and perception of risk are related to culture alone. In a people-centred approach, it would involve several other layers of complexity. Beliefs, attitudes, values and the behaviour that goes with them are also connected to individual traits including what is normally called personality. This involves a complex interaction of psychology, genetic make-up and neurochemical responses to the environment (including other people). Culture does overlap with the personal, and so there is a need to understand not only the ‘social construction’ of risk and responses to risk, but also the interaction of the social (culture) with the individual,

with personality and factors that relate to behaviours which may not always be a product solely of society.

Clearly ‘personality’ is to some extent outside of culture, because it is largely derived from individual genetic make-up. But it is also known that genetically-directed behaviour is influenced by society more generally. For example, sexism (negative male attitudes towards females) and gendered behaviours (differences in how males and females behave) change in different cultural and historical contexts. The tendency of many people to be drawn to religion is considered by some neuroscientists to be embedded (‘hard wired’) in human behaviour. This is expressed in terms of a willingness to believe in the ‘supernatural’ as a way of explaining the unknown, but also of relating to oneself and others through emotions rather than ‘facts’ (Ariely, 2009). Accepting new ‘external’ knowledge can mean people having to reduce their sense of identity because by doing so they have to deny or alter an existing attitude or value that they cherish.

Understanding the links between culture and disaster risk reduction

This *World Disasters Report* is intended to at least open the door to culture for organizations that work in DRR and climate change adaptation. It is partly ‘awareness raising’ and aims to make it legitimate for professionals and organizations to realize that cultural issues are significant. The aim is to show how culture is important – both in the ‘people’s culture’ of those who face risk and for the ‘organizational culture’ of those who are trying to help. Most readers will recognize much of what is discussed, and that it is of such great significance that more must be understood about how it affects their work. Culture is not about ‘residuals’ that can be ignored as strange and illogical: it is absolutely crucial to the way that DRR and adaptation succeeds or fails. In the context of climate change – with more vulnerable people and more frequent and/or more intensive extreme events – it is foolish to ignore one of the most significant factors affecting success.

For DRR and adaptation, as in most situations when an outside organization engages with people at the local level, two cultures or ‘belief and knowledge systems’ interact. The local (‘indigenous’) and the external (‘expert’) systems each appears to be coherent and logical in themselves: their outlook, resources and cosmologies make perfect sense to the people involved, and the people’s and organization’s behaviour is embedded in and justified by the culture. This dualistic idea of the differences is, of course, simplified, since they interact and have an effect on each other. But the key point is that they are initially different and contradictions can emerge between them.

The idea for this topic of culture and risk arose in a group of academics and NGO staff from around the world who have been concerned for some years that DRR has excluded culture and ignored lessons from other disciplines that are highly relevant. The editors of this World Disasters Report have also organized two conferences on the topic, both in Germany (in 2011 and 2013), from which a more academic volume will be published (Krüger et al., 2014). The editors of the report do not see it as providing all of the answers. Their suggestion is that once the organizations involved acknowledge the culture clash and start being aware of the different ideas that people have about risk, then much better progress can be made in DRR and for adaptation.

Understanding the fact that people have different priorities even when living in 'at-risk' areas requires broadening the frame of reference. It is no longer sufficient to focus narrowly on trying to understand how to improve DRR programmes when these are largely defined by 'outsiders'. Instead, it becomes necessary to invest in understanding the rationalities for a wide variety of behaviours, some of which appear to outsiders to be 'irrational'. This means moving beyond conventional frames of reference of the disaster 'sector' and exploring other disciplines such as psychology, public health, anthropology, sociology and behavioural economics. Moreover, it requires confronting the (often) difficult questions that different rationalities pose for DRR programming, namely that the priorities and worldviews of the relevant organizations are not the same as those of the people they aim to help.

People live within (and for) their culture while they live with risk. Culture is partly a long-term evolved 'strategy' for survival in the face of risk, where people can engage in behaviour that is sometimes calculated and sometimes spontaneous. In one example of volcanic risk in a Spanish island territory, conflicting risk perspectives between the local people (anxious to protect their livelihoods) and the authorities are clear, with the people making a calculated 'performance' of a partially invented culture in order to support their interests (see Box 1.3). When people consider that they cannot do much about risk (and they have to take risks in order to survive), then their interpretations of danger are influenced by culture, can modify culture and are deeply inscribed in their day-to-day dealings with risk and livelihoods.

Without understanding people's different rationalities, any outsider's expectations of attitudes to risk will be misplaced. Most DRR interventions expect people to behave in ways that minimize the same risks as those identified by the outsider. These interventions fail to take adequate account of the cultural behaviours that often lead to people having different rationalities. The supposed 'irrational' risk perceptions are linked with cultural interpretations of disasters and have evolved in order that people can co-exist with hazards, enabling them to 'discount' the effects of a disaster. Other beliefs justify why some people deserve to suffer more than others and, in many cases, culture can increase people's vulnerability by supporting values that put people at risk.

Many DRR organizations are divorced from the realities of the life and the expectations of those who are at risk, in either their thinking or their doing, or both. People do not behave in the way that disaster managers and institutions want – or expect – them to behave. There is a strong parallel with the way that conventional economics interprets human behaviour in very rigid ways, usually based on the narrow ‘rationality’ of profit maximization and the aggregated behaviour of *homo economicus*. DRR staff and institutions are often aware of the gaps between their own goals and those of the people they are claiming to help, although they may not understand why this is the case. Organizations are also likely to be dependent on funding from donors who are willing to support DRR for specific hazards and who cannot or do not want to work on the causes of poverty and vulnerability. There needs to be greater willingness to accept that this is a problem. It is very difficult for organizations that are charged with DRR to change their focus and carry out work that supports people in their needs for everyday life, even when the people do not show much interest in dealing with the severe hazards. Yet, clearly, for there to be increased success, people’s culture and risk priorities must be taken into account, with the hope that the outcome is much greater integration of DRR with adaptation and development.

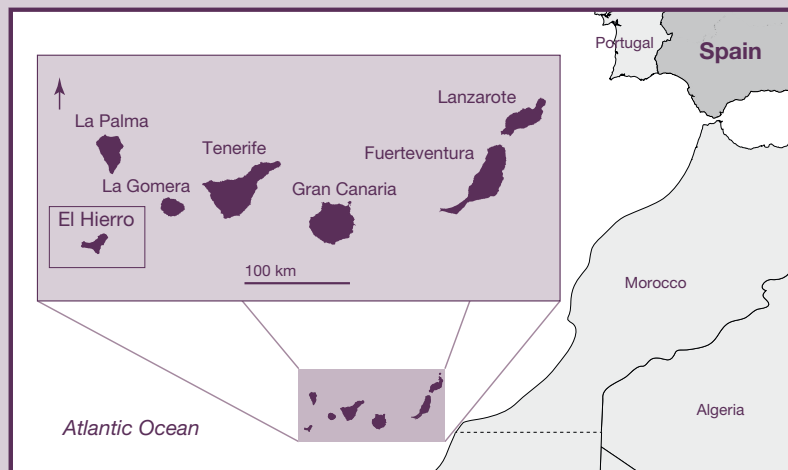
This need is also shown by the information in Figure 1.2, an ‘infographic’ that shows the number of deaths worldwide during the 20th century that can be attributed to different categories of identifiable causes. It is worth noting the very small share of deaths that can be attributed to natural hazards: the data ‘bubbles’ can barely be seen – at the bottom right of the graphic. The vast majority of deaths are understandably a result of disease. However, many of these illnesses are preventable, and are related to problems of development – poverty, inadequate health services, poor water and sanitation. One of the largest bubbles is for smallpox, which has now been eradicated globally. But many of the other big killers of the 20th century remain potent or are increasing – including many that are related to poverty and likely to increase with climate change. Others can be attributed to ‘overdevelopment’ or increasing wealth, for instance diseases of diet and ‘lifestyle’ (obesity, diabetes, smoking, drinking alcohol).

What is interesting is that for many of these there is a connection with culture. If culture is significant in relation to risk and natural hazards, it is also clearly to be found in human behaviour for many other types of risk: diet, dangerous substances that bring pleasure or addiction, willingness to engage in conflict, attitudes to other people who can be defined as ‘outsiders’ and potential enemies, traffic ‘accidents’ and cultures of driving dangerously. In short, it becomes abundantly clear that whether organizations are interested in preventing disasters linked to natural hazards, or many other types of risk, it is impossible to do a good job unless they recognize, understand and begin to deal with the effects of culture.

BOX 1.3 Staging a disaster and restaging a ‘community’ – the seismic crisis of El Hierro

Small islands and their communities appear to be a perfect laboratory for disaster risk studies: clear-cut, isolated, manageable and consistent. But what if a disaster reveals that the idea of an island ‘community’ is a metaphor rather than a coherent entity and, in addition, a ‘disaster’ is staged rather than real?

In October 2011, El Hierro, the westernmost island of the volcanic archipelago of Spain’s Canary Islands and home to around 11,000 people, experienced a volcanic crisis, its first documented seismic activity in the last two centuries. A submarine eruption, preceded by an increasing series of low-magnitude earthquakes, caused colouring of the sea, the emission of gas and floating volcanic bombs. Located two kilometres offshore, south of the fishing village and diving site La Restinga, the eruption continued for five months (Carracedo et al., 2012).

FIGURE 1 Location of the Canary Islands

For scientists, this was a rare chance to observe an ongoing eruption on the Canary Islands. Different hypotheses arose about the dangers posed by the situation and, in reaction to a potentially serious event, a special plan for civil protection came into effect that delegated responsibilities to various regional and national institutions. The decree called for wide-

spread participation but some of the regional experts were excluded, which would foster a lasting dispute about the ‘mismanagement’ of the crisis (Perez-Torrado et al., 2012). Emergency forces from the army were sent to the island and in the course of the eruption, La Restinga was evacuated twice. Such measures, which also included a fishing ban that affected fishers and diving tourism, were viewed critically by some of the island’s population. El Hierro’s politicians were overwhelmed by the situation and worked hard to relay information, even though it was sometimes contradictory.

While the population faced a very unsettling, if fascinating, natural event (which thankfully caused no casualties), the situation triggered an intense and partly dramatized media coverage. Imagery of disembarking military forces and pictures of the ‘boiling’ sea were combined with alarming reports of ‘poison gas alert’ or ‘explosive gas bubbles’. To this day, a number of web-blogs contain reports about the island’s continuing ‘earthquakes’. Maps depicting seismic events contribute to these disaster narratives, although most of the seismic activity they chart is below the threshold of perception.

A viewpoint shared by most locals is that alarmist news coverage and actions taken by authorities had a needlessly deterrent effect on tourism, which declined by around 60 per cent in two years.

A 'hazardous place' developing concurrently with the economic crisis in Spain, where unemployment was more than 30 per cent, created a double crisis that affected many of the islanders' livelihoods. Official statistics (ISTAC, 2014) do not reflect a heavy drop in the island's population, but many inhabitants assume a wave of emigration.

A closer look at the range of experiences of El Hierro's inhabitants reveals that the crisis people lived through was actually the interaction and circulation of rivalling 'framings' of the natural event. These fluid sets of interpretations and ascriptions often served certain objectives; ascriptions supplied by the media are different from those of scientists, politicians, people involved in the tourism industry and others.

As framing El Hierro as a hazardous place has damaged the islanders' well-being, many coping strategies have aimed at altering how the seismic event has been represented. Local media, aware of the potential negative impact of 'disaster vocabulary', are now trying to manage their imagery and reporting carefully. Authorities now tend to refer to positive examples of volcanic activity (as Hawaii does) and omit statements about possible risks. The local tourism industry has started web-blogs attempting to reassure clients that the island is safe and campaigns now spotlight the island's volcanic origin.

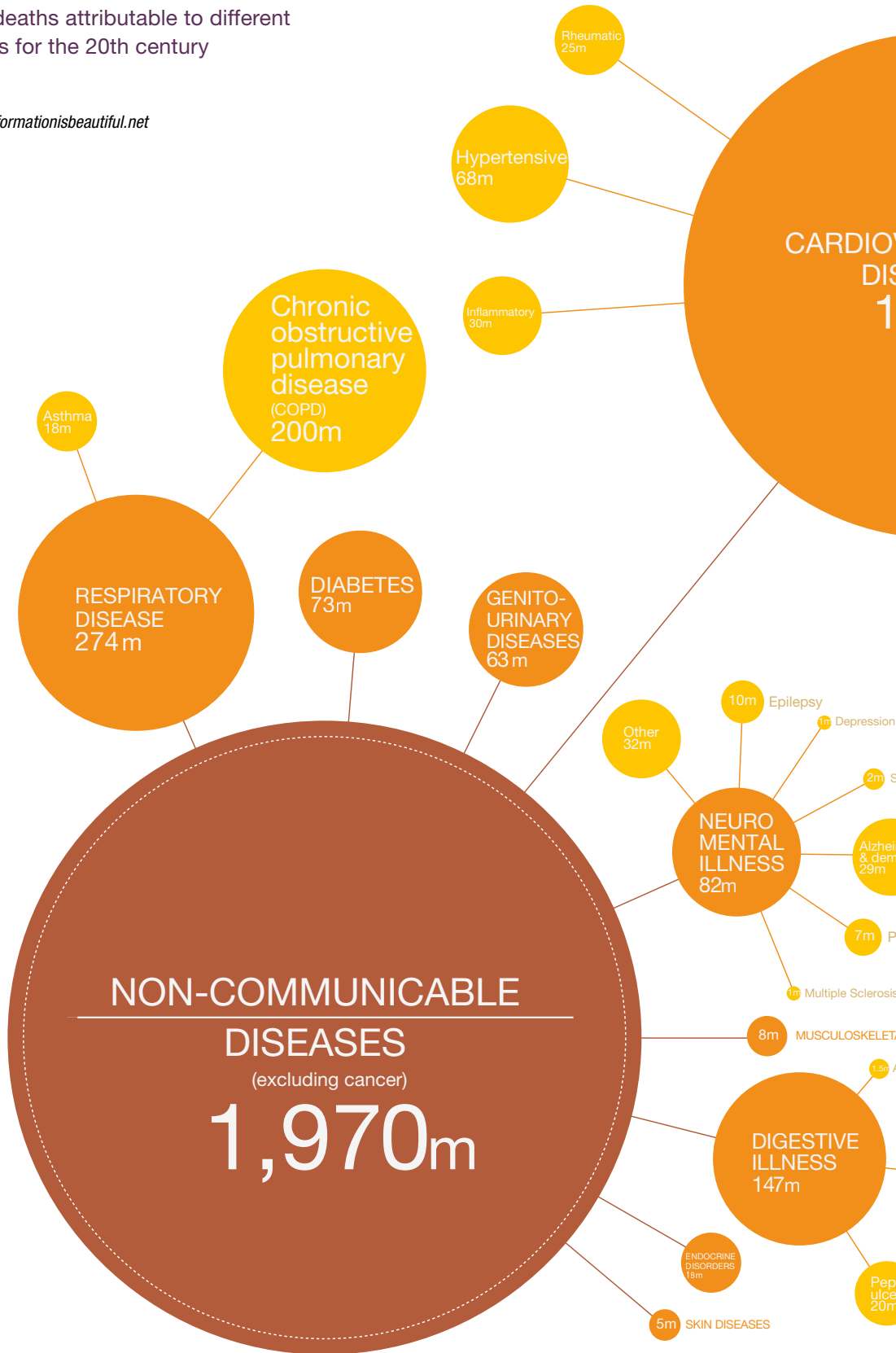
This 'restaging' also has an effect on islanders' risk perceptions, as it differs from their own interpretation of events. As a consequence, different ascriptions have been merged into a meta-framing that somewhat reconciles varied perspectives. In this sense, El Hierro's 'identity' has gained new importance.

El Hierro is often described as the 'most remote' or 'forgotten' of the Canary Islands due to its isolation and historical role as a political underdog in relation to its neighbouring islands. Socio-economic disadvantages and hardship caused by water scarcity and periodic drought have always fostered waves of emigration and remigration. Many cultural symbols of the island incorporate social unity, modest living, a connectedness with the soil and the 'wild' nature of its volcanic origin. Being *Herreño* means being connected to nature, neglected by those in power and, consequently, a member of a resilient and strong community. This notion of a community is constantly reproduced in local folklore, art, literature, advertising and political discourses.

As this community-defining framework is very compatible with current circumstances, where potential threats and the fight against adversity are highlighted, statements from individuals in regard to volcanic risk or the crisis in general often return to it. In short, to counter the crisis, long-established framings are mobilized and, thus, the significance of the community is increased. This has important implications. The image of a resilient and unified community entices certain actors to de-emphasize differing perceptions of risk and verbally downplay social differences. Accepting volcanic risk as being part of the island's nature establishes a certain self-assurance and is an effective 'counter-framing' to avoid further deterrence of tourists. But taking individual precautions or showing fear have now become a taboo in some cases and visible actions of disaster preparedness, such as public emergency drills, are frowned upon by some. Local emergency services are well equipped and constantly improving, but face resentment which can become an obstacle. This situation may increase the island's vulnerability to both volcanic hazards and the effects of further disaster narratives. A moderate earthquake (magnitude 5.1) in December 2013 and ongoing tectonic deformation of the island indicate that there is still a real need to improve preparedness. ■

FIGURE 1.2 Total deaths attributable to different causes for the 20th century

Source: David McCandless/informationisbeautiful.net



VASCULAR
DISEASES
,246m

Ischemic
heart disease
540m

Stroke
410m

Other
cardio-
vascular
178m

HUMANITY
980m

Civil wars 20m
1st Chinese (1928-37) 5m
2nd Chinese (1945-49) 2.5m
Ethiopia (1974-92) 2m
Nigeria (1966-70) 1m
WWII 66m
Soviet - Afghanistan (1979-89) 1m
WAR 131m
Korea (1950-3) 1m
Vietnam War (1965-73) 2m
WWI 37m
Mexican Revolution (1910-1920) 1m
Iran-Iraq (1980-88) 1m

IDEOLOGY
142m

Ba'athism (Saddam Hussein) 2m
Catholicism (condom edicts) 3m

Communism 94m
Afghanistan (1979-86) 5m
Eastern Europe (post WW2) 1m
Soviet Union 20m
China 65m

Fascism 28m
Japan 6m
Nazi Germany (1933-45) 21m

MURDER
177m
Suicide 89m

Homicide 58m

genocide 30m
East Pakistan / Bangladesh (1971) 1.5m
Mengistu, Ethiopia (1975-76) 1.5m
Brazil - Indian (1900) 1m
Yakubu Gowon (1967-1970) 1m
Nazi 16m
Khmer Rouge - Cambodia (1975-1978) 2m
Rwanda (April-July 1994) 1m
Armenian genocide (1900-1923) 4m

AIR POLLU
116m

Schizophrenia

Alzheimer's dementia

Parkinson's

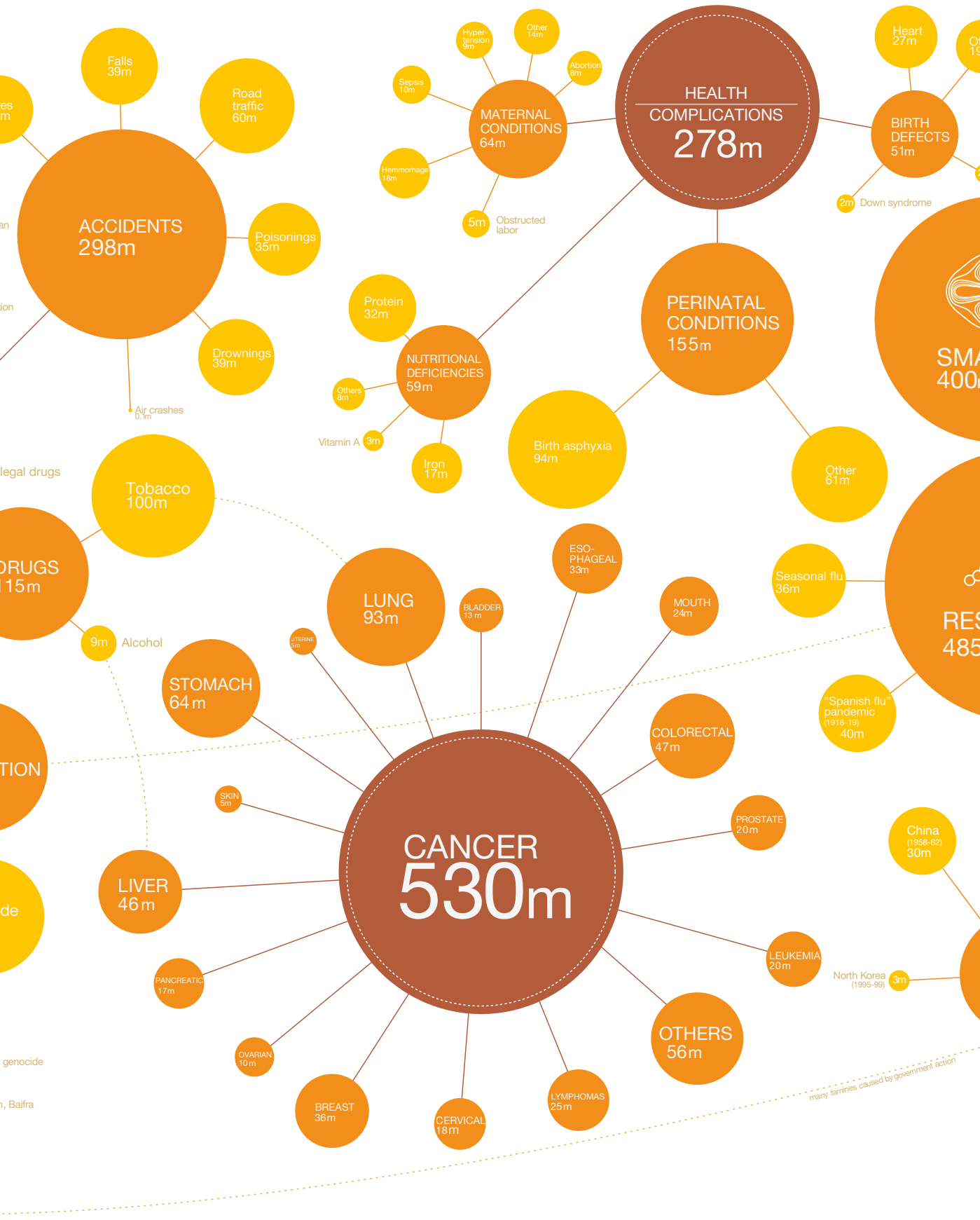
AL

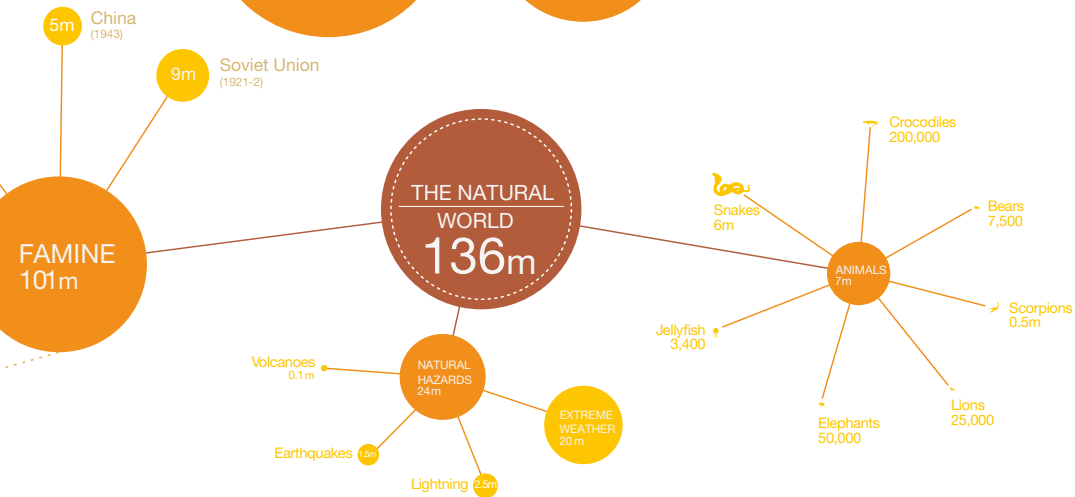
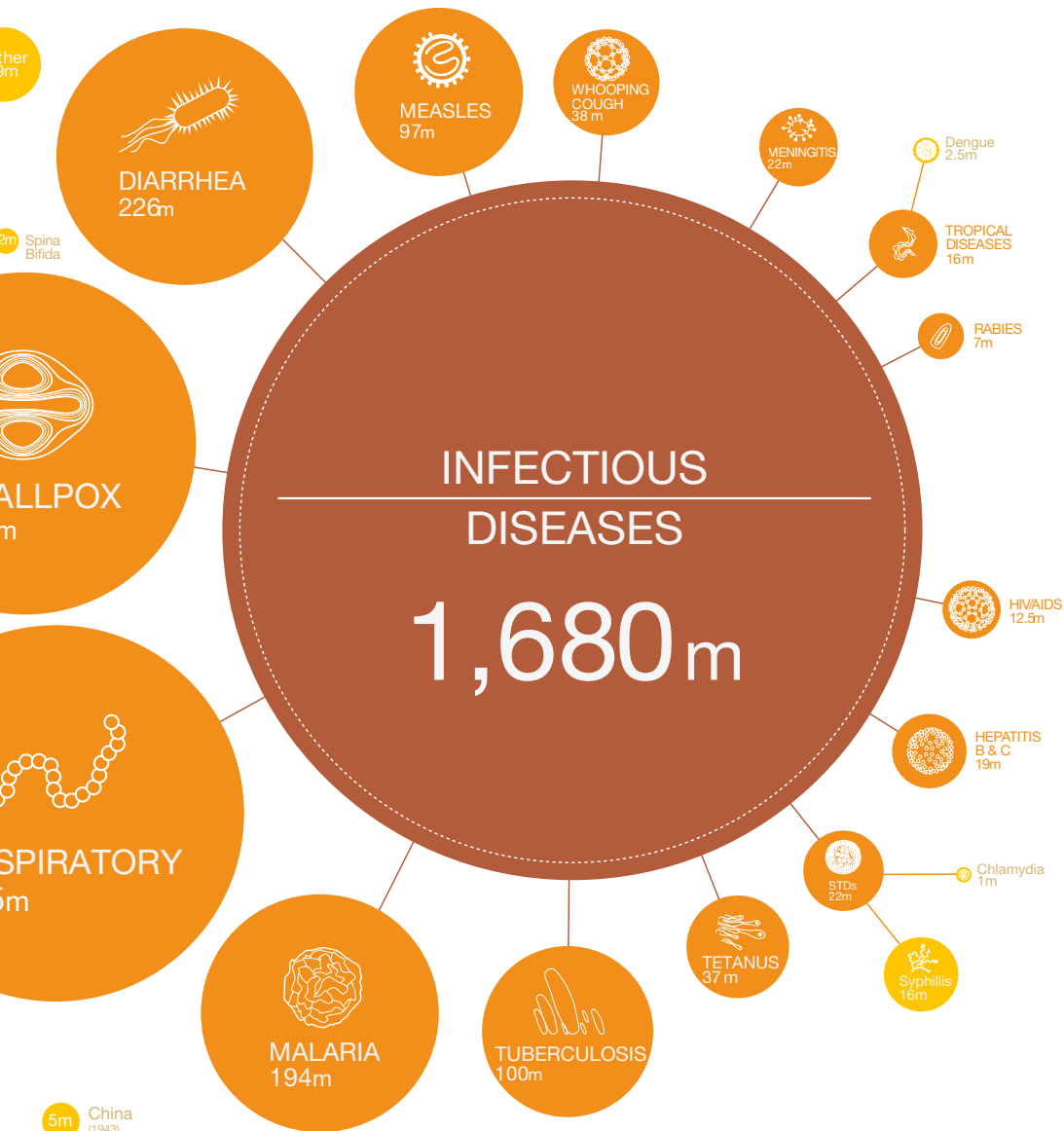
Appendicitis

Cirrhosis
of liver
59m

tic
r

double count





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How religion and beliefs influence perceptions of and attitudes towards risk

Why is it that, even when they have information about an imminent hazard, not everyone acts to minimize the impact that a hazard may have on them? Instead, people may ignore the risks or consider that their ability to influence them is so small that they do not believe that risk reduction is worthwhile. People may also actually expose themselves to greater risk simply because of the way their perceptions of reality make them think or behave. This may seem counter-intuitive to those who work on disaster risk reduction (DRR), because it is difficult for them to imagine such a perspective. The lens through which people see the world is formed by norms and understandings that come from a wide range of factors that are unique to each individual. Different worldviews are shaped by things like religion, traditions, politics and social structures. These are significant aspects of culture because they influence individual and communal attitudes, perceptions and behaviour. Worldviews affect the way people think about and react to risk from natural hazards. Consequently, people's beliefs may lead them to deny the existence of a threat, impede them from taking the appropriate action or encourage them to behave in a way that increases their vulnerability to hazards. What is often not considered by those who promote DRR is that natural hazards are not always perceived as dangerous events – to some they are simply the way in which gods, spirits or other important beings manifest their power. From this perspective, the question is: why consider avoiding the impacts?

This chapter describes how people's perceptions and attitudes towards risk are shaped by religion, customs, social norms and other dimensions that influence the way they think and behave. Religion is a particularly important driver of perceptions and behaviour, in both constructive and harmful ways. In this chapter, religion is discussed along with non-religious beliefs (such as faith in technology, see Box 2.3) that shape worldviews and influence perceptions and behaviour. The two dimensions of beliefs that emerge most prominently in the context of DRR are the way that beliefs form an obstacle to reducing risk (something that makes people think or do things that are counter to risk reduction or that increase their vulnerability) and the way in which beliefs influence people's understandings of risks. Since relevant terminology around this topic is debated, key terms are explained in Box 2.1.

The island of Nias in Indonesia was hit by the 2004 tsunami and, three months later, by a strong earthquake. Towns along the coast were destroyed, including many places of worship such as this church in Sirumbu.
© Olav Saltbones/IFRC

BOX 2.1 Key terms

Whose truth counts? This crucial question hints at the challenge of discussing different worldviews. Owing to the many different opinions about the most appropriate terminology, ‘spirituality’ and ‘beliefs’ are used in this chapter to describe the cultural dimensions that are relevant to the discussion on disaster risk reduction. A number of other terms could be used, some more academic than others. This box includes some of these terms to help the reader wanting to explore this topic further. Interestingly, terminology can also be a reflection of worldviews. Golden, Audet and Smith (forthcoming, 2015) found that the term ‘continuity’ was preferable to ‘adaptation’ in the context of climate change among the First Nations people in Canada, because the former better matched their perspectives on how they relate to their land.

Belief – the philosophy by which someone is guided and which influences their worldview. It may be a formal doctrine or a set of personal ideas, sometimes not fully articulated. To some, this term is derogatory, meaning that beliefs are not valid truths, but simply people’s irrational views. This chapter uses beliefs to reflect anything that people believe without judging the validity of those beliefs.

Belief system – used to describe a specific type of faith, commonly subscribed to by a group of people, in the divine, as well as in other doctrines.

Cosmology – the ordering or arrangement of the universe, including the physical world and, therefore, also the human world.

Doctrine – a set of ideas or beliefs. Doctrines can be religious, political, etc., and can be shared and formally recognized.

Faith – belief and trust in a doctrine, often used implicitly to denote a lack of faith in scientific deductions.

Religion – all forms of belief systems based on spirituality, mysticism and faith in divinity, enshrined in formal institutions in organized religions and also expressed in devolved form through superstitions, mythology and folk tales.

Theodicy – the problematization of and the attempt to resolve the contradiction between, on the one hand, the existence of evil and unjust suffering, and on the other hand gods’ major attributes, namely “universal benevolence, omniscience, and omnipotence” (Merli, 2010).

Worldview – perception of the world. Each person has a unique worldview, but some align closely with others, typically if any particular shared doctrine or belief dominates the worldview.

Relevant risk terms

Risk – the potential for consequences where something of human value (including humans themselves) is at stake and where the outcome is uncertain (IPCC, 2014a).

Exposure – the presence of people, livelihoods, species or ecosystems, environmental services and resources, infrastructure or economic, social or cultural assets in places that could be adversely affected (IPCC, 2014a).

Vulnerability – the propensity or predisposition to be adversely affected (IPCC, 2014a). The characteristics of a person or household (that result from their economic, political, social and cultural circumstances) which make them more or less likely to be hurt by a hazard. ■

Research and understanding of people's beliefs in relation to risks seem to be almost completely ignored in the practice of DRR. Religion and other belief systems have been studied extensively in the sociology of religion, cultural anthropology, ethnology and the psychology of risk, yet this knowledge is rarely consulted for disaster risk management activities. If there is awareness of these issues, it is often excluded from DRR because dealing with it is difficult and potentially biased. The challenge lies in exploring and working with people's risk perceptions and practices without suggesting that one version of reality is superior to another, even when some beliefs are potentially or actually a barrier to DRR. This chapter offers insight into how religious and other beliefs matter and how awareness of both their advantages and disadvantages must be integrated into disaster prevention, preparedness and response.

TABLE 2.1 Different religious approaches to perceptions/attitudes and behaviour/responses

Linkages	Possible approaches			
Beliefs and perceptions/attitudes	Religious beliefs determine attitudes about hazards: cause, reason, magnitude, location, adverse consequences	Religious beliefs determine attitudes about risk: cause, degree of danger, people at risk	Religious beliefs determine attitudes about disaster: cause, magnitude, impact, location, people affected	Religious beliefs determine attitudes about responding to risk: spiritual consequences, effectiveness of responding
Beliefs and behaviour/response	Religious beliefs require behaviour that increases vulnerability to hazards: e.g., requiring certain attire that restricts swimming during floods, requiring prayer during dry periods that takes time away from finding alternative income	Religious beliefs include activities that directly address environmental degradation and factors that increase risk	Religious beliefs implicitly or explicitly discourage/encourage anticipatory behaviour to reduce vulnerability to hazards	Religious beliefs implicitly or explicitly discourage/encourage reactive behaviour to respond to impacts

Source: Schipper, 2010.

For those working in DRR, it is difficult to look past religious and other beliefs because they are sometimes the main cause of people exposing themselves or others to greater risk of natural hazards. At the same time, outsiders' responses to religious interpretations of risk can be dismissive and negative. Recognizing and respecting that people see the world in different ways is a crucial first step towards being able to address the problems that are generated by the diversity in interpretations. An example from the Swiss Alps illustrates this. For 350 years, local villagers prayed (with the Pope's support) for the Aletsch glacier in the Swiss Alps to retreat because it caused repeated avalanches and floods. But now climate change is causing the glacier to retreat rapidly, threatening the availability of drinking water, animal feed and energy. Locals are concerned that their prayers have worked too well. In 2009, they petitioned the Vatican to change the 350-year-old prayer to request that the glacier does not retreat (Spinney, 2012). The international press picked up on the story about the prayers and the glaciers. 'Another fascinating example of people behaving oddly in the face of disaster'

was the tone of most of the articles. Yet religious belief is strong enough among the villagers for them to turn to it also to find a solution to climate change. Who is to say that such a response does not provide a valuable social network and necessary psychological help, regardless of beliefs or outcomes? Even if others may regard it as irrational and a barrier to effective risk reduction, DRR practitioners cannot simply wish people's beliefs would go away: they must work with them.

Why beliefs matter

Spirituality and beliefs are powerful forces for influencing individual and group decisions, livelihoods, lifestyles and attitudes, as shown in the remaining chapters. They influence perceptions of nature, including how natural hazards and associated risks are interpreted. For example, religious faith provides social networks and a vital source of hope for people coping with the consequences of disasters (Basit, 2007; Chhean, 2007; Pollock, 2007). The associated customs, rituals and traditions provide structure and a sense of identity for many individuals and groups. They have cultural significance and often play a role in defining social and cultural heritage, for instance by appearing in folklore stories or songs. Yet, people's risk perceptions can lead them to behave in ways that expose them to greater risk, such as living near a frequently flooding river in El Salvador in the belief that God will protect them from the associated risks that they understand well (Schipper, 2010). Even when people do not have particular views about hazards, their beliefs may encourage them to do things that increase their risk. For example, the Orthodox Christian faith in Ethiopia requires people to spend time away from their fields in prayer, leaving crops untended and at risk of failing (Schipper, 2008).

TABLE 2.2 Entry points for examining religion in the context of disaster risk reduction and adaptation to climate change

Focus on capacity	Focus on reducing risk	Focus on responding to disasters
A-1. Role of religion in supporting development	B-1. Role of religion in influencing policy on environment and climate change (positively)	C-1. Role of religion in helping people to emotionally overcome disaster (mental health)
A-2. Role of religion in encouraging social capital (organization) for coping during difficult times	B-2. Role of religion in raising vulnerability to hazards	C-2. Role of religious institutions in supporting disaster relief and recovery processes
A-3. Role of religion in influencing preventive and reactive responses to disaster risk and climate change	B-3. Role of religion in reducing vulnerability to hazards	C-3. Role of religion in influencing relief and recovery processes (rebuilding, planning)

Source: Schipper, 2010.

Cultural definitions of catastrophic natural events and people's responses to them are inseparable aspects of the same process (Turton, 1979). Part of the response can be found in how affected people place these events in a broader cosmological order, calling into question notions of human and supernatural agencies and

finding explanations for their occurrence. An example is the 1692 earthquake that flattened Port Royal, Jamaica. At the time the town was considered lewd and unpleasant, with many brothels and other 'bad' behaviour. Its destruction was seen by some as a punishment, with one eye-witness saying "... by this terrible Judgment, God will make them reform their lives, for there was not a more ungodly People on the Face of the Earth" (quoted in Gragg, 2000). Yet culture should not be singled out or blamed uncritically for people's behaviour in response to a disaster and its aftermath.

People do not like uncertainty and unknowns. Religion and other beliefs play an important role because they help explain and sometimes justify why disasters occur. This can help people deal with questions about why something devastating happened to them: they can turn to their beliefs for comfort after an event occurs. For those living in dangerous places, a belief that a high-impact hazard will happen because of a divine intervention offers some rationality: at least they have a reason why it happens.

Non-religious beliefs also matter

People are consciously or unconsciously drawn to religions and beliefs that align with their worldviews, which have developed through their experiences and reflect their culture. People choose to follow certain doctrines because these match their cultural heritage, priorities, values and economic interests. There are similarities with people's response to the idea of climate change, which may provoke tremendous emotional reactions and denial that it exists. Deniers typically claim they do not believe the science but their basis for denial lies primarily with their discomfort about what accepting the science may mean for them personally. They characterize climate change as something you believe in or not on the basis of faith rather than evidence. It is also possible to construct a belief system that is not religious in order to remain emotionally stable when threatened by hazards. An example of this is how faith in technology becomes a doctrine of its own, enabling people to live with the threat of floods and avoid having to make decisions based on realities (see Box 2.2).

BOX 2.2 Ecomyopia and flood adaptation on the Mississippi River

Why don't people who know they are at risk of a disaster move from harm's way? Disasters are complex and our understanding of their causes is fragmented. Logical contradictions often occur within cultural explanations of disasters and people try to avoid thinking about these contradictions. They sometimes start to believe what other people believe, without question. The result can be 'ecomyopia' – believing what individuals want to be true rather than recognizing the ecological limitations of their actions. In the

United States, *ecomyopia* can manifest as blind faith in the power of technology to reduce the risk of disaster. It is more common to use political power and financial capital for technological solutions than make difficult decisions that might threaten the status quo.

Since 2008, anthropologists have been studying human response to repeated flooding in the upper Mississippi River valley in the United States. The Mississippi River has a large drainage area of about 3 million square kilometres. Spring snowmelts in the upper watershed or heavy rainfalls in one or more tributaries frequently cause flooding of homes, businesses and farms. Most of the flood plain is used for commodity-based agriculture. Flood-plain farms are typically 500 to 800 hectares and are organized into drainage districts that maintain levees and pump water out of farmland back into the river. These are among the most productive and profitable farms in the world. Nearly all middle Mississippi flood-plain wetlands are drained and have levees, and the river is mostly restricted to a navigable channel. Other flood-control efforts include spillways, dams and storage lakes operated by the US Army Corps of Engineers.

Large losses from successive flooding show that the battle to 'tame the Mississippi' has not succeeded. Elevated water levels and water pressure that result from restricting the river to a channel often cause levees to fail, inundating flood-plain communities. The levee system is also ageing, creating a policy debate on whether to invest in levee construction or wetland restoration. Despite the profitability of local farms, drainage districts lack sufficient capital to rebuild levees. Funding at the national level would require the US Congress to pass specific legislation adding the cost of levee reconstruction to the federal budget. Meanwhile, the hydrology of the river is changing. Annual flows are becoming less predictable while high-volume discharges from the upper watershed are becoming more common. Flood-protection and navigation infrastructure also alter hydrology. Levees and dams themselves contribute to the flooding by restricting flow. Climate and hydrological models of future conditions seriously challenge the rationale of building larger levees.

As part of a comprehensive policy analysis, researchers have conducted 121 interviews and focus groups with farmers, homeowners, business-owners, elected officials and government personnel. Three major observations emerge from the analysis. Nearly every stakeholder understands that the hydrology of the Mississippi River is changing and that flooding is occurring more frequently. Most individuals are averse to relocating homes and businesses, with the exception of some people who have experienced severe repeated flooding. Many stakeholders believe in technological solutions like dredging the river channel or building better levees. But there is also a vocal contingent who believes that agricultural levees should be removed or modified to allow more storage of water on agricultural land during flood events. In areas where businesses and homes are not protected by levees, many people believe they are being flooded more frequently because of agricultural levees elsewhere. The agricultural community overwhelmingly rejects any option that would take land out of production, either intermittently or permanently.

Agriculture dominates the economy and politics in the Midwest of the United States. *Ecomyopia* results within powerful interest groups when members recognize that their political and financial capital can be used to invest in maintaining the status quo from which they receive benefits. In such cases of 'groupthink', members embrace information that legitimizes the existence of the group and

excludes information that threatens existing power structures. Those with political power attempt to use this to define problems in a way that also prescribes solutions. In the case of the Mississippi River, the agricultural lobby has successfully framed the policy debate around what kind of technology should be used for flood control and how it should be financed. This success is possible only because of a broader faith in capitalism and technology in the United States.

The industrial revolution and post-Second World War economic growth in the middle class led many Americans to believe that technological innovation and free market capitalism would create affluence around the world. Medical advances, large infrastructure projects like dams and highways, and the green revolution in agriculture rapidly increased affluence during an era in which many people believed they were becoming exempt from ecological constraints. In some cases, the need to control nature in order to produce wealth has become a mission of moral rectitude. One farmer who was asked why he would not relocate out of a flood plain answered, “You have to understand, we feed the world.”

Moral rectitude is the rationale being used to argue for increased infrastructure, such as levees, and technologies, such as better flood-prediction systems, that allow for continued occupation of the flood plain. In general, people choose to accept risk rather than uncertainty. A farmer whose house and farm had been flooded three times has dedicated considerable time and effort to lobbying for bigger levees and dredging the river channel to minimize risk rather than relocating into an uncertain future.

Some scholars have argued that the marriage of capitalism and technology is the new religion in American culture. Whether supernatural or techno-capitalist, the power of any belief system lies not in how well it conforms to ecological realities, empirical evidence or logical coherence, but in the fact that individuals believe other people hold similar beliefs and will behave in predictable ways. But when political or economic power obfuscates ecological limits and policy options, ecomyopia can lead to disastrous results. ■

Values and attitudes are also shaped by political factors, including wars. In the midst of a conflict, people rarely have the ability to make decisions independently of their affiliations. For example, in Sri Lanka the cultures of both the government and the Liberation Tamil Tigers of Eelam (LTTE) and their respective supporters fuelled decades of civil war, which deepened social and economic divides along geographical and ethnic lines. The LTTE rebellion was driven largely by the lack of equality and opportunity for Tamils, but the conflict stifled economic growth and development in the areas where most of them lived. People in the north were cut off from essential government services and had to rely on the LTTE for infrastructure, education, healthcare and livelihoods. A ceasefire was being observed when the 2004 Indian Ocean tsunami struck more than two-thirds of the coast. The disaster demonstrated how the territory was divided according to the two sides involved in the conflict. Northern and eastern conflict-affected zones that were hit by the tsunami were desperate for outside assistance. However, they were prevented from getting international aid by both the government of Sri Lanka and

later the LTTE, in case the aid was used for conflict-related purposes. The prospect of a neutral organization to administer aid and help to diffuse the conflict through cooperative humanitarian efforts for civilians on both sides was lost because of the long-standing beliefs and mistrust.

Interpreting what is happening

In many parts of the world, particularly those where local cultural practices and worldviews are deeply embedded in everyday life, beliefs often exert considerable influence on the ways that people perceive risks and respond to them. To the disaster management professional, employed to reduce the human toll of disasters, traditional beliefs can seem unhelpful even to the point of unnecessarily increasing people's exposure to risk. Yet DRR activities invariably sideline religions and beliefs and ignore the benefits that such communities derive from them.

Beliefs about hazards are grounded in people's understanding of the cause of a particular risk. Today there are scientific explanations for earthquakes that relate to abrupt movements of the lithospheric plates that comprise the surface of the solid Earth. But one need go back only 100 years to see that there was a diversity of beliefs, usually grounded in religion or culture of different people, sometimes as a result of repeated observations of earthquakes and their effects (Vitaliano, 1973). Natural hazards (volcanic eruptions and earthquakes in particular) were once widely interpreted as a result of actions by a divine being within the Earth – an example of the anthropomorphization of nature (Schlehe, 2010).

Ritual noise-making was employed in many cultures with the intention of trying to avert disaster (Grandjean et al., 2008). In Tonga, in the south-west Pacific, for example, when an earthquake occurred it was believed that the god Maui, who held the islands upright from below, was nodding off to sleep, so the people made as much noise as they could to wake him lest he allow their island to slip beneath the sea (Nunn, 2014). By making a connection between affected peoples and the responsible deity, the purpose was to stop the ground shaking. Such responses were invariably within the context of a belief system that attributed motive to gods of earthquakes, something that often involved relationships between gods who controlled other aspects of the natural world, such as food-producing systems, weather and climate, and oversaw the dynamic relationships between different human groups.

Such belief systems were important not only to understand why particular natural phenomena occurred but also to enable the affected people to influence their occurrence. All over the world, there are examples of beliefs through which people seek to influence natural phenomena by attempting to communicate their wishes to the gods. These methods can generally be classified as rituals, involving offerings, sacrifices and sometimes monument construction. For example, as early as AD 680,

there is evidence of a ritual attempt to prevent an eruption of Mount Kaimondake in Japan (Shimoyama, 2002) and long traditions of similar attempts elsewhere. Adherents of the Pele cult in the Hawaii Islands in the United States followed rituals intended to calm the spirit of the active volcanoes on the island of Hawai'i and divert lava flows away from inhabited areas (Nimmo, 1986).

The world's more predominant religions have provided modifications of such traditional beliefs. Thus Islam is now blended with pre-Islamic beliefs on Indonesia's Mount Merapi volcano where the people of Yogyakarta annually renew a pact with the gods that no lava will be directed southwards to the heart of the sultanate (Schlehe, 2008). Christian belief systems provide a context for local entreaties to halt lava flows and eruptive activity more generally among communities threatened by the Italian volcanoes Etna and Vesuvius (Chester, Duncan and Dibben, 2008). On occasions, the impact of a disaster that the people had ardently sought to avert has led to a loss of faith in a particular deity. An example from northern Peru around AD 1100 concerns the Sicán Deity, believed to control nature, who was discarded following a series of extreme (flood and drought) events (Jennings, 2008). The earthquake and tsunami that destroyed Lisbon in 1755 had a major effect on Christian belief in Europe (Dynes, 2000).

Culturally grounded knowledge about environmental risks (commonly earthquakes, volcanic eruptions and floods) was nurtured by most people exposed to them because it rationalized their continued danger. Communities thus felt themselves more in control, commonly seeking fault within themselves or evil intent from outside when disaster struck. People are drawn to spiritual explanations for disasters when confronted by events that for them have no identifiable cause (Gunn, 2007). Examples from Mount Merapi have been well documented (Donovan, 2010); for example, in villages on the volcano's southern flanks, there is a belief in spiritual creatures which control eruptions but also inform the living when they are imminent (see Box 2.3). Annual ceremonies to acknowledge these creatures have led to a situation where local residents have faith in their protective influence even at times when the volcano is active. When an eruption does affect part of the area or particular people, it may be explained as a consequence of residents' inappropriate behaviour. Where an eruption fails to happen (despite government warnings) or the people escape the lava flows, it confirms for them the power of their prayer or cultural activities. In 1994, an eruption of Popocatepetl (Mexico) was not as powerful as expected and many local residents, who believed in making offerings to the god of the volcano, refused to evacuate and felt they were proved correct in their belief (Tobin et al., 2007).

BOX 2.3 The cultural landscape of Mount Merapi volcano, Indonesia

The way people interpret and react to disasters is partly driven by their experience of past hazards and shaped by local beliefs. It is a 'cultural landscape' that can amplify either resilience or vulnerability. Deaths from eruptions of Mount Merapi (central Java) relate to the cultural influences that can lead to people deciding not to evacuate. During an eruption in 2006 many people stayed home because they were reluctant to abandon property and livestock. But most also believed that they were protected by *makhluk halus*, supernatural unseen creatures that supposedly have the power to control eruptions (Donovan, 2010; Donovan, Suryanto and Utami, 2012). This traditional animist belief system is shaped by the people's experiences and the ways that eruptions have affected different parts of the volcano in the past. As well as lava flows, eruptions are most dangerous when they involve pyroclastic flows (avalanches of hot gas, ash and rock that can travel at 150 kilometres per hour) that are often channelled by the terrain of the mountain. Since the volcanic soils are fertile and provide for people's livelihoods, people's beliefs and socio-economic needs are interdependent, and their decisions about risks they face are a complex interaction in this cultural landscape.

Merapi is visible from Yogyakarta city and in 2010 it was estimated that approximately 1 million people lived on the volcano. During the 20th century, eruptions produced localized hazards that affected the immediate vicinity of the volcano (up to 15 km from the summit). But much larger eruptions could potentially affect Yogyakarta and beyond. The eruption in 2006 made global headlines because Mbah Maridjan, an elderly man living high on the southern flank, refused to evacuate and, according to media reports, inspired others to do the same. Why did he hold so much influence over communities on the volcano? The answer lies in Javanese myth and legend – the cultural landscape of the risk and opportunities of the volcano.

Mbah Maridjan was appointed by the previous Sultan of Yogyakarta as *juru kunci*, the gatekeeper or guardian of the volcano (Schlehe, 1996). Sworn never to leave the volcano, his job was to appease the *makhluk halus* who supposedly protect and can destroy the settlements that cover the volcano's slopes. The role of *juru kunci* is part of a wider belief system underpinned by Javanese legend and reinforced by the benefits of living in an active volcanic region (Dove, 2008). At the time of the 2006 eruption, more than 80 per cent of Merapi residents interviewed either refused to evacuate or did so on a part-time basis, leaving their livestock and homes only in the evenings. There appeared to be two main reasons for not evacuating. First, they did not want to abandon their livestock and risk losing their livelihoods and, second, they believed they were safe from volcanic hazards because they had not seen the traditional warning signs on which they relied (Donovan, 2010). The most significant of these is instructions from the *makhluk halus* through *wisik* (dreams or premonitions). It was also believed that, if insulted, these creatures could destroy a settlement, so one form of protection was to carry out ceremonies to appease them. These coping strategies are communicated throughout the region using morality tales or taboos.

Of crucial importance for disaster management, the cultural landscape involves different beliefs and degrees of 'cultural intensity' in different locations around the volcano. In some areas residents are primarily influenced by Islam, rather than the traditional animist beliefs. Occupants of other places

north and east of Merapi have a strong spiritual relationship with the volcano and would, therefore, refuse to leave under any circumstances. Yet they have a different attitude to the spirit guardian and tend not to believe in him but rely on their own customs and experience. Although they are at risk of explosive eruptions, these areas have not been affected for 100 years and their residents are confident that the volcano will not affect them in the future. In the east, people believe that a rocky ridge will act as a barrier to lava flows, while people in the north believe they are living on the volcano's back. As with a person, they think Merapi will only 'vomit', or erupt, from its mouth and they are protected by living where they do. Consequently these residents have low hazard awareness and a reluctance to evacuate (Donovan, Suryanto and Utami, 2012).

Traditional beliefs form only a part of people's attitudes to the danger, with a complex combination of folk beliefs, trust in the volcano guardian, assessments based on past hazard frequency and location, concern for loss of property, all combined with attitudes of mistrust towards the government. For example, those living in isolated locations west of Merapi distrust the authorities, fuelled by stories of land being sold while residents are kept in evacuation centres, which influences responses to official warnings and enforced evacuations. The people are afraid to leave their belongings, and fear the government will move them permanently and will even make money by evacuating them. In any case, in these isolated regions, the roads are poor and cross large rivers flowing down the volcano. If there was a large eruption these people would have little chance of evacuating quickly or at all.

The dangers of Merapi's eruptions were again demonstrated in 2010, when more than 300 people were killed, including Mbah Maridjan. Again he refused to evacuate despite official warnings from the government.

Merapi is not unique among volcanoes in having strong folk knowledge and religious attitudes to risk. At Mount Etna in south Italy, people lay down offerings in an attempt to halt lava flows, while in Seattle in the north-western United States, Native Americans identified and marked earthquake fault lines and incorporated them in their myths long before scientists surveyed the region. In 1963 at Mount Agung in Bali, Indonesia, more than 1,000 people were killed in a procession heading towards lava flows, believing the flows were their gods descending to greet them. Clearly for DRR to succeed, the relevant organizations must take account of people's own beliefs and attitudes to the volcano hazards that are embedded in their lives. Perhaps there can also be compromises between volcanic science and warnings, and the local beliefs. After his father was killed in 2010, Asih Lurah Surakso Sihono was appointed as the new spirit guardian of Merapi. When interviewed in 2012, he indicated that he would be willing to liaise with the local volcano office to avert future disaster (Hodal, 2012). ■

Defining what is meant by an environmental risk and agreeing how to reduce exposure to it are not easy tasks. Several examples show how people have incorporated the effects of 'disasters' into their worldview and do not aim to avoid them. This may seem incomprehensible to others, particularly those with formal training in disaster management, but it is clearly important as a resilience strategy among such groups (Cashman and Cronin, 2008). Examples are found throughout the islands of Vanuatu in the south-west Pacific, where volcanic eruptions,

earthquakes and tsunami are comparatively common, yet such “disasters are perceived as social rather than natural events ... not feared but respected” (Galipaud, 2002). And there was ambivalence towards earthquakes in medieval Japan. They were sometimes represented as desirable for their role in redistributing wealth. Richer people lost materially, poorer people gained by being employed in recovery activities. The event provided “an impetus for society to regain its social and financial health ... earthquakes were like medicine for an ailing society” (Ludwin and Smits, 2007).

Belief systems also influence the responses of people threatened by recent manifestations of climate change. For instance, the lives and livelihoods of many residents of low-lying islands in the Pacific have been affected by rising sea levels, during both normal and extreme conditions (Nunn, 2013). While most Pacific island governments have embraced the rhetoric of global change, little of this has filtered down to the people in any meaningful way. So their attitude towards these changes is usually culturally grounded and contextualized in religious (mainly Christian) belief systems (Kempf, 2012). As on other islands that live with continual threats of disaster, most Pacific island people consider that their devotion to God is sufficient to protect them from harm. So their response to the signs of climate change is generally to regard these as manifestations of short-term climate variability (rather than long-term change) that will eventually be reversed. Examples of this are seen in Fiji and Tuvalu (Lata and Nunn, 2011; Mortreux and Barnett, 2009).

A more subtle approach was found in a study of attitudes towards environmental change in the Peruvian Andes (Paerregaard, 2013). Traditionally the Tapeños people made regular offerings to the rain-fed water sources on which their agriculture depended, believing that the controlling gods would then ensure sufficient rain. In recent years, global ideas about climate change have affected the Tapeños and their belief that rainfall is controlled by the gods has been eroded. Yet many groups continue to make offerings, fearful that the gods will otherwise be angered and punish the people in other ways.

Climate change poses a different series of environmental risks that are longer-term and unprecedented for most of the world. It will, therefore, test the effectiveness of many traditional beliefs. This situation will be made worse by increasing population densities in many of the most vulnerable areas as well as human-accelerated degradation of many food-producing systems, particularly subsistence systems on which people in low- and middle-income countries routinely depend. In many parts of the world, religious organizations are among the most active institutions seeking effective adaptation. In the United States several faiths find explicit support for this in their holy books and are working together to both influence government and engage their co-religionists (Schaefer, 2014). A similar situation applies in Ghana where all major faiths agree that environmental stewardship is the only way to sustain livelihoods (Golo and Yaro, 2013).

Coping with the impacts

People turn to their beliefs when they see no hope or to find comfort (Gunn, 2007). Many also seek out religious groups for help and buildings, such as churches, mosques and synagogues, for shelter (Koenig, 2007). Immediately after the 2011 Tohoku earthquake and devastating tsunami that triggered the Fukushima nuclear crisis, a group of Japanese religious scholars created social media, such as the Religious Network for Earthquake Relief in Japan, a web site entitled the Map of Religious Institutions for Earthquake Relief and a coordination centre called the Japan Religion Coordinating Center for Disaster Relief (Fujiwara, 2013). At the same time, reflections on the nuclear crisis led to the identification of links between technological approaches and religion, as in the connection made by controversial intellectual Shinichi Nakazawa between nuclear power and monotheism, and his request to turn towards eco-friendly technologies more apt to polytheistic, animistic and Buddhist traditions (Fujiwara, 2013). A Japanese anthropologist coined the term *saiinron*, cause of disasters, to refer to “a socio-cultural system of idea and practice that offers people explanations of misfortunes and disasters afflicting them as well as directs them as to how to cope” (Nagashima, 1987). Box 2.4 shows some of the complexities of understanding the different layers of culture relating to, and blamed for, the Fukushima disaster, and how it has been contentious in Japanese society.

BOX 2.4 Reacting to the Japan earthquake and tsunami in 2011: only in Japan?

On 11 March 2011, a magnitude 9.0 earthquake struck Japan, causing a massive tsunami and a melt-down of the Fukushima Daiichi nuclear power plant. During this compound disaster, international media questioned why the Japanese people, under such difficult circumstances, managed to maintain their calm and orderly attitude despite such massive losses of human life and infrastructure.

Jean-François Sabouret, emeritus fellow at the Centre national de la recherche scientifique in Paris, claims that Japanese people are supported by their strong Shinto faith even during the worst of disasters. They believe in human obedience to nature and resign themselves to fate (France Télévision, 2011). For Sabouret, the concept of ‘enduring the unendurable’ lies at the heart of Japanese values. Gregory Pflugfelder, associate professor of Japanese history at Columbia University, New York, told CNN in an interview why Japanese society shuns looting: “Social order and discipline are so enforced in ordinary times that I think it’s very easy for Japanese to kind of continue in the manner that they’re accustomed to, even under an emergency” (Hunter, 2011). Despite some clear cases of looting and violence in the wake of the disaster, Pflugfelder’s view remains popular among many Japan experts.

It is noteworthy that this ‘only in Japan’ argument is also found in the Japanese Parliament’s report which concluded that the Fukushima nuclear accident was “the result of collusion between the government, the regulators of Tepco [the power plant operator], and the lack of governance by said parties” (McCurry, 2012). Kiyoshi Kurokawa, the commission’s chairman and a professor emeritus at Tokyo University, stated in the report’s introduction, “What must be admitted – very painfully – is that this was a disaster ‘Made in

Japan.’ Its fundamental causes are to be found in the ingrained conventions of Japanese culture: our reflexive obedience; our reluctance to question authority; our devotion to ‘sticking with the programme’; our groupism; and our insularity.” He further argued, “Had other Japanese been in the shoes of those who bear responsibility for this accident, the result may well have been the same” (McCurry, 2012). Yet critics such as Naoko Shimazu, professor of history at Birkbeck University, London, make the point: “[O]bedience, reluctance to question authority, sticking with the programme and insularity, are not at all unique to Japan” (Shimazu, 2012).

How can the suggested connection between disaster preparedness, response and culture be interpreted? Is Japan so unique that the population can always endure the unendurable or is it merely a ‘cultural gloss’ touted by politicians and the media?

Japan straddles at least three tectonic plates that have rattled the nation throughout its long history. Home to a large number of the Earth’s earthquakes of magnitude 6 or greater (Government of Japan, 2011) and various types of other natural hazards including typhoons, landslides, floods and volcanic eruptions, the nation has experienced countless disasters. Historical documentation has recorded not only the type of disasters to strike the country, but how people have perceived them throughout the ages. One early example is depicted in the Hōjōki essay (方丈記) from the Kamakura period (1185–1333) which makes a reference to the earthquake on 9 July 1185. Drawing on the concept of ‘impermanence’, one of the main doctrines in Buddhism, the text describes humanity’s powerlessness against nature. It adds that disasters are warnings from the deities to remember people’s state of impermanence.

Historical documentation may imply an interconnection between religion and people’s attitudes to disaster in Japan, but it is incorrect to suggest that this is a general characteristic of the country. As in any other country, despite surface appearances, Japan has no single identity or culture. There is, in fact, a wide variety of cultures at different levels with roots in different religious beliefs and cultural values. The perplexing interlink between Buddhism and Shintoism, a native and unique animist tradition characterized by individual rituals instead of fixed prayers or dogma, further complicates the interpretation of the role of culture and religions in forming people’s attitudes towards disasters. In a recent public survey by NHK, Japan’s public broadcaster, 26 per cent of respondents said they had no association to religion or faith (NHK, 2012). It seems the nation’s disaster management mechanisms have little direct association to cultural and religious aspects.

Yet on another level studies imply that traditions and religious customs play a significant role in building disaster-resilient communities through rituals and festivities. In Tohoku, the most disaster-affected region, there is evidence of Shinto shrines having played a significant role in keeping communities together. Having miniature shrines carried throughout the disaster-affected areas contributed to revitalizing the local towns and communities, as seen in the district of Shishiori in the Miyagi prefecture. According to Katsuhiko Takizawa, associate professor at Nagasaki University, it is possible to find historical and cultural roots in a number of events and activities carried out by local communities. For instance, ‘Fujin-Boka Club’, a women-led community post-disaster support group in the city of Iwanuma is well connected to the concept of *kou* (講) which has its roots in Buddhist and Shintoist culture, from the Edo period (1603–1868). By looking at individual local communities, Takizawa concluded that religions, culture and customs play a significant role in disaster preparedness and recovery.

While it is impossible to prove a direct link between religion, culture and people's attitudes to disaster at national level, the Japanese are certainly more prepared for disasters owing to the large volume and various types of natural hazards they experience in their lives. While the nation's view is probably divided between the views of Kurokawa and Shimazu, when it comes to their attitudes towards disasters, people in Japan seem to show more readiness because of their experiences with different types of natural hazards. As Lesley Downer, a journalist and expert on Japan, states, "Living with the constant threat of earthquake, the Japanese have created an orderly society, which perhaps makes it easier to cope with the violence and unpredictability of nature" (Downer, 2011). This may be the best expression of the 'unique' culture of Japan. ■

Disasters have such a profound effect on societies that religious differences that can be a source of tension may be overlooked in the immediate relief efforts, when people get involved to help with rescue, basic healthcare and burials across ethno-religious distinctions (Klein, 2007). Ethnic and religious identities and boundaries may not actually 'collapse' as distinctions, but they may be temporarily set aside in order to aid others (Merli, 2005, 2010, 2012). Keeping these identity boundaries fluid may represent a specific social and physical post-disaster survival strategy. For instance, in Honduras after Hurricane Mitch in 1998, there was mobility across religious institutional divides between Catholic and Evangelical Protestants (Ensor, 2003). This was also briefly the case immediately after the Indian Ocean tsunami of 2004, when Sri Lankans on both sides of the decades-old conflict joined forces to rescue people in the north-eastern part of the country. This area was one of the hardest hit but also one of the rebel-occupied zones. Yet as soon as aid began flowing into the country, the ceasefire agreement broke down and the war flared up again until 2010.

But religiousness and spirituality are not immune from being affected. Disasters make some question their faith and ask why they were affected, to the point where they abandon one doctrine for another (Wilson and Moran, 1998; Ensor, 2003). This could be seen in El Salvador, where Evangelical Protestantism was introduced by missionaries seeking to undermine the strength of the Catholic Church in the rebel communities during the civil war of the 1980s. The crucial ingredients of the Evangelical faith that were attractive were fatalism and individualism, both of which discourage taking action to change one's social conditions (Ensor, 2003; Schipper, 2010). Ironically, the introduced religion, which attracted many who felt helpless anyway in the midst of such bloody crisis, also continues to attract those who feel helpless in the face of devastating disasters such as Hurricane Mitch.

Other studies after Hurricane Katrina (2005) in the United States and the Chilean earthquake of 2010 suggest that people who experience the greatest hardship are more likely to explain their experience as an act of God (Stephens et al., 2013). This relationship is partly because poor people tend to be both more vulnerable to natural hazards and more religious.

How do different disaster actors think about beliefs and risk?

The first step to changing the way that DRR institutions deal with religion and beliefs is to understand how they consider them at the moment. This section looks at helpful, less helpful and even damaging ways in which beliefs are considered, and reflects on what happens when beliefs are ignored or left out entirely.

Policy-makers and decision-makers

Belief systems generally play no part in national-level policy relating to environmental risk or longer-term environmental threats (as from climate change). At sub-national levels, local belief systems are sometimes more prominent and may result in refocusing national priorities, particularly those relating to risk management. Examples come from federal nations like Australia and the United States where states may implement policies for environmental risk that are at odds with national ones (Fisher, 2013) and may be affected by religious belief. Other examples include sub-national strategies for risk aversion, ranging from downgrading (reordering) of particular risks (Petheram et al., 2010) to the explicit acknowledgement of local belief systems in dealing with threats associated with active volcanoes (Bankoff, 2003).

One major issue that is likely to arise in the next decade or so in many countries is whether coastal settlements vulnerable to rising sea levels should relocate. This is an issue in which religious beliefs can play a role. In some Pacific islands, many Christians believe that God will ensure their homes are not submerged and their ancestral lands remain habitable (see Box 7.1). The belief is strong enough for island leaders to refuse to contemplate relocation (Haluza-DeLay, 2014). The ecumenical Pacific Conference of Churches has a different view, now shared by some governments, that relocation of coastal settlements throughout this island region is unavoidable (Kempf, 2012). Where resettlement happens there will be a need to consider the cultural dimension and to deal with the lack of any shared history for the new residential places (see Simpson, 2012). Giving people a new identity without considering their existing cultural identity will create problems in these new mixed settlements.

Pointing to a divine cause of a disaster allows politicians and leaders to avoid taking the blame. This is useful when poor city planning, bad road construction or corruption are the real causes that translate a hazard into a disaster. Some politicians may use the disaster experience as a kind of moral awakening in terms of political and policy plans. In this way religious (or cultural) terminology can be used to disguise a political agenda. Sri Lanka's President Chandrika Kumaratunga claimed the 2004 Indian Ocean tsunami had been a religious awakening for her, changing her position from a previous anti-privatization platform into starting an eager programme

of privatization of public utility services, interpreted as “the tsunami as divine punishment for failing to sell off Sri Lanka’s beaches and forests” (Klein, 2007).

Others take advantage of the opportunity to chastise people’s behaviour, sometimes with directly contradictory goals. Shintarō Ishihara, the conservative governor of Tokyo, defines the 2011 tsunami as *tenbatsu* – Heaven’s punishment. Meanwhile religious movements such as Happy Science (*Kōfuku no kagaku*) suggested that it was caused by the ruling Democratic Party. Similar discourses were circulated in the media, often by politicians with liberal beliefs (Fujiwara, 2013). These do not identify the cause as a divine being. Instead it is Nature in its supernatural form, taking revenge for human exploitation of natural resources or for the condition of society (whether it be moral corruption, economic greed or conflict). Fumihiko Sueki, a Japanese religious scholar, stated that “great disasters happen when a nation goes down the wrong path and are left by gods and buddhas” (Fujiwara, 2013). Other leaders may avoid blaming the disaster on the supernatural so that the gods are available to guide recovery and give people hope (Lindberg-Falk, 2010).



Humanitarian agencies

Both religious and non-religious humanitarian and aid agencies rush to the rescue when a disaster occurs. The task of delivering aid is accompanied by the phenomenon of ‘convergence’, in which the local scene becomes congested by many outside professionals often employed in reconstructive efforts and relief operations (Hoffman, 2010). Anthropologists have noted that local knowledge and participation tend to be ignored or consciously dismissed, as decisions are made by external actors (Barrios, 2010). When the outside agencies access a territory devastated by disaster, pre-existing social or ethnic divisiveness can affect the allocation and distribution of funding, as in the discriminatory treatment of Muslim fisherfolk in Sri Lanka following the 2004 tsunami (de Silva, 2009). In Sri Lanka, buffer zones were created to keep people from resettling near the coast, but significantly in the areas with a majority Muslim population the buffer zone stretched further inland than in the areas that were predominantly Sinhalese (Gaasbeck, 2010). This meant that Muslim fishers were less able to access the coast than their Sinhalese counterparts, damaging their livelihoods.

Religious and cultural conservatism is strong in Pakistan’s Khyber Pakhtunkhwa and the Pakistan Red Crescent and the IFRC are utilizing clerics as entry points to communities. Here Pakistan Red Crescent volunteer Qasim Shah chats to senior cleric Abdul Waseer Shah during a first-aid training session in Banna, Allai Valley.
© John Tulloch/IFRC

Religious organizations have tended to focus on aiding their own members because of easier access. This has lessened recently with acceptance of the ‘non-discrimination norm’. Certain religious organizations have an explicit missionary intent, whereas others limit their interventions to a particular religious community (Barnett and Stein, 2012a; Benthall, 2012). Religious preaching after a catastrophe can be seen as exploiting the affected people (Simpson, 2012). How local people relate to aid can be very functional, as in the notion of ‘rice-bowl Christians’ (used to identify the converts following Evangelical activity in Cambodia, China and Viet Nam) and ‘disaster Evangelism’ (Ensor, 2003). Faith-based organizations may respond to specific concerns of the local government and people about their religiousness. The organizations modify their branding to reduce the faith aspect and increase the visibility of their humanitarianism so as not to fuel local people’s fears (Hopgood and Vinjamuri, 2012).

But there is a contradiction between reducing the visibility of a religious approach and the need for ‘cultural solidarity’ that acknowledges the crucial role that faith plays in boosting people’s ability to cope. Places of worship also serve as important gathering points, even safe zones. They provide sanctuaries for people to pray and grieve (Benthall, 2012). After the Indian Ocean tsunami, images of survivors crowding mosques prompted great generosity (see Klein, 2007), as did the horrific films of bodies piled up in Thai temples awaiting identification (Merli, 2005).

Researchers

Research on beliefs and risk has begun to creep slowly into the mainstream. The most recent *Fifth Assessment Report* of the Intergovernmental Panel on Climate Change illustrates how the scholarly study of culture and climate change has grown (IPCC, 2014b). It has especially affected the discussion on the limits to climate change adaptation, suggesting that cultural dimensions need to be considered to help reduce vulnerability to climate change. Yet one of the challenges remains how to study beliefs. From a practical point of view, the biggest research gap is the need for better understanding of how to intervene when beliefs are responsible for raising vulnerability to natural hazards (Schipper, 2010). Studies that aim to investigate religiousness and map this against various indicators exist (e.g., Stratta et al., 2012) yet there is no consensus on the appropriate methodology and it is questionable whether a quantitative approach can really capture the intricacies of belief systems and how they play out in times of disaster.

International organizations and donor partners

Most international organizations and high-income country participants (donor partners) in initiatives to reduce environmental risk (including climate change)

are intentionally agnostic in their approach. They would argue that to be otherwise would be to introduce a degree of subjectivity into analyses that should be informed solely by science. This is not to say that there is no sensitivity to religious beliefs, particularly when single-faith communities in low- and middle-income countries are assisted by high-income countries in which that faith dominates.

The agnostic approach by these organizations towards environmental risk rests on the assumption that people in the target countries (for assistance) will be, irrespective of their own belief systems, receptive to such global messages that these will therefore strengthen community resilience. This ignores the way in which people's worldviews influence their interpretation of the messages. Particularly in the last ten years, this assumption has been shown in numerous instances to be naïve and, rather than achieving intended outcomes, actually encouraging maladaptation (O'Brien and Wolf, 2010).

Key aspects to integrate into disaster risk reduction

There are at least six reasons why beliefs are relevant to disaster risk reduction.

The positive ones are that beliefs:

- help people cope with the immediate impacts and longer-term consequences of a disaster and are an important psychological and social element in recovery
- can provide a reserve of social capital that can be tapped to facilitate recovery, including support, information and resource sharing such as donations
- can provide a platform, framework and social grouping that can be useful for educating about risk reduction.

Those that are invariably less helpful involve beliefs that:

- can be an obstacle for building back differently, relocating people or making other changes to livelihoods to help reduce exposure or sensitivity to future hazards
- contribute to creating the vulnerability that can convert hazards into disasters
- can create an alternative reality that makes it difficult to educate about risk reduction.

People are uncomfortable with uncertainty and the unknown, and use belief systems to help explain or understand what is happening to them and around them. Culturally significant explanations develop because they rationalize people's continued exposure to hazards. While these can certainly be frustrating for disaster reduction professionals who may understand little or nothing of the beliefs and

have little or no sympathy for those who do not share their own beliefs, religion and spirituality should be recognized as a form of social capital and prioritized as such for recovery (Rahill et al., 2014). But as with all social capital, for some to have it may mean that others are deprived or discriminated against, for example where there are conflicts about beliefs or alternative explanations of risks.

People of different religious beliefs also perceive disasters differently (Fernando, 2005). Their ways of thinking about themselves relative to their social network, village or country matter for how they act. This difference is noted between Evangelical Protestants and liberation theology Catholics in El Salvador and Honduras (Schipper, 2010; Ensor, 2003). But other beliefs also influence people to think in different ways. In religions that emphasize rebirth or a better life after death, for example, there may be less concern about events such as disasters, which are mere small blips in the larger universe of existence.

The issue of beliefs and disasters is clearly complex and provokes strong emotions in many people. It is difficult to speak about the topic without immediately disclosing one's own worldview, which cannot be exactly the same as anyone else's and, therefore, may lead to mistrust or judgement. At the same time, problems are likely to arise if disaster managers fail to take this crucial aspect of culture into account when assessing vulnerability, examining hazard impacts and helping to reconstruct homes and lives.

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Taking livelihoods seriously

The last chapter examined how culture and perceptions of risk often make people reluctant to support risk reduction. This chapter looks at another factor and focuses on the great importance of taking people's livelihoods seriously. This is essential because, in much of the world, dangerous places are also livelihood places. Why do people live in dangerous places when they are aware of the risks? It is also the case that after a disaster, many people carry on living in the same place. Sometimes this is because they are poor and have little choice, or because their livelihood is bound up with that specific location and they are not certain what they could do instead in a different place. Whatever the reason, it is a significant challenge for disaster risk reduction (DRR) and adaptation to climate change (CCA) that people live in dangerous locations. And one of the most significant reasons that people live in dangerous places – whether out of choice or because of poverty – is because that is where they can make a living and get their livelihood (see Figure 3.2).

Livelihoods are therefore a key to understanding people and their risk-taking behaviour. The problem is that, while the institutions that want to help with DRR and CCA are focused on the severe risks, the people usually have very different concerns. In this clash of priorities, the significance of livelihoods and the culture and perception of risk that go with them is extremely important and needs to be taken much more seriously.

Livelihoods are often better in danger zones: flood-plain and volcanic soils are very fertile; coasts are good for fishing and farming; and fault zones in arid areas often have associated water supplies. All over the world, there are towns and cities that provide livelihoods but are located on coasts, rivers and fault lines. People exchange the benefits of the livelihoods with the danger of the hazards that can affect those locations. In effect, they 'discount' the future risk of the big event in order to get the day-to-day benefits of the livelihood. For them, the value of current benefits outweighs the costs of future risks. Even if they might lose their home in a disaster, living in that place provides the everyday benefits for subsistence, jobs and economic opportunities that they would not get if they moved to a safer place.

As Chapter 2 shows, people adjust to risk through cultural and religious interpretations and create their traditions and beliefs in order to deal with uncertainty. This increases their sense of control in relation to risk, or allows for external causes of disasters that they cannot control and must therefore just live with. By doing this, people exchange the risks of the occasional disaster with the daily benefits they get from the fertile soils, the water supply and the companionship

People may accept to live in dangerous places or they may be forced by poverty to do so. One of the most significant reasons for this is because they live where they can make a living and get a livelihood, like Dang who grows and sells rice in a flood-prone region of Viet Nam.
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of others who share their location. Culture is the way people enable themselves to live with risk: given that they cannot (or prefer not) to move out of the way of danger, then their traditions, customs and practices allow people to live with risk without emotional collapse.

Making a living involves using the assets available and combining these (usually within households) to find the best way of surviving and (where possible) improving well-being (see What is a livelihood? below). People's income, nutrition, health, education and general well-being all derive mainly from being able to carry out livelihood activities. In high-income countries the term 'livelihood' is not used so often. People think more of economic opportunities and earning a living, but this is similar to the idea of livelihoods. It is about using different types of assets (in high-income countries, this is more likely to be education and skills than land and farm tools) to earn a living. The concept of livelihoods has been widely used in low- and middle-income countries, especially through frameworks like the Sustainable Livelihoods Approach (SLA) (Carney, undated; Scoones, 1998), the Access model for disaster analysis (see chapter 3 in Wisner et al., 2004) and in many methods for assessing livelihoods, such as CRiSTAL, Save the Children's HEA (Household Economy Approach) and CARE's Household Livelihood Security Approach.

What is a livelihood?

When people are making a living, they engage in livelihood activities that enable them to subsist, survive and perhaps accumulate resources and wealth (as savings). A livelihood can include hunting and gathering, farming a small plot of land for subsistence or working on other people's land for a wage, fishing, herding livestock as a pastoralist, being employed in a factory, begging, selling goods on the street corner or at traffic lights, teaching, driving a bus, working in a factory making clothes or processing fruit, and so on. Where people have no way of earning a living, they may be able to rely on a pension or welfare support as their livelihood.

Each livelihood requires certain 'assets' or 'capitals' that are required for a particular way of making a living. Farmers must have access to land and water, and if they don't own their land they must rent it from others or work as sharecroppers (see Box 4.5). Or they can earn money as a labourer, using the 'asset' of their muscle power. A teacher must have a qualification and a bus driver, a driving licence. Farming people who live in unequal land tenure systems often have few assets and therefore few opportunities in earning their living (see Chapter 4 on land tenure, for example). The Sustainable Livelihoods Approach divided assets into five categories in order to better analyse livelihood systems and reasons for poverty and vulnerability (Carney, undated; Scoones, 1998). The five SLA categories are:

Financial: including income, savings, ability to access credit, welfare receipts and (on the negative side) debts

Human: education, health (to enable people to work), muscle power, training, experience

Physical: buildings needed for livelihood, transport access (e.g., for marketing), electricity access, water supply

Natural: farm land, water access, forests, fisheries, pasture land

Social: networks that can support livelihoods or access to other assets; extended family, clan connections, political connections, gang membership, patron–client relations, age groups, caste membership.

In many VCA-type activities, evaluating these assets is part of the assessment process. It should be noted that having high levels of some assets (e.g., land) can be at the expense of other people who, therefore, have less of that asset. Social capital is also not always ‘good’, because when some people have one type of connection it can be harmful to others (e.g., gangs, caste group).

In many situations in much of the world, assets that enable livelihoods are combined within households and used to work out the best strategy for using those assets. The household then acts as a basic economic unit in which earning and livelihood strategies can be decided (usually by men). The household assets are operated in various ways to provide subsistence and earn money, with each active member of the household (which, in low-income countries, includes many children) playing a part in the process. Some members may not actively earn money (often this includes women and children), but their work – which, in many countries, often exceeds that of men – is essential to the success of the wider livelihood activities: collecting water and fuel, cooking, caring for children, nursing elderly or sick family members. An individual or a household may also decide that one person should migrate to a town, a city or even a foreign country as part of their livelihood strategy.

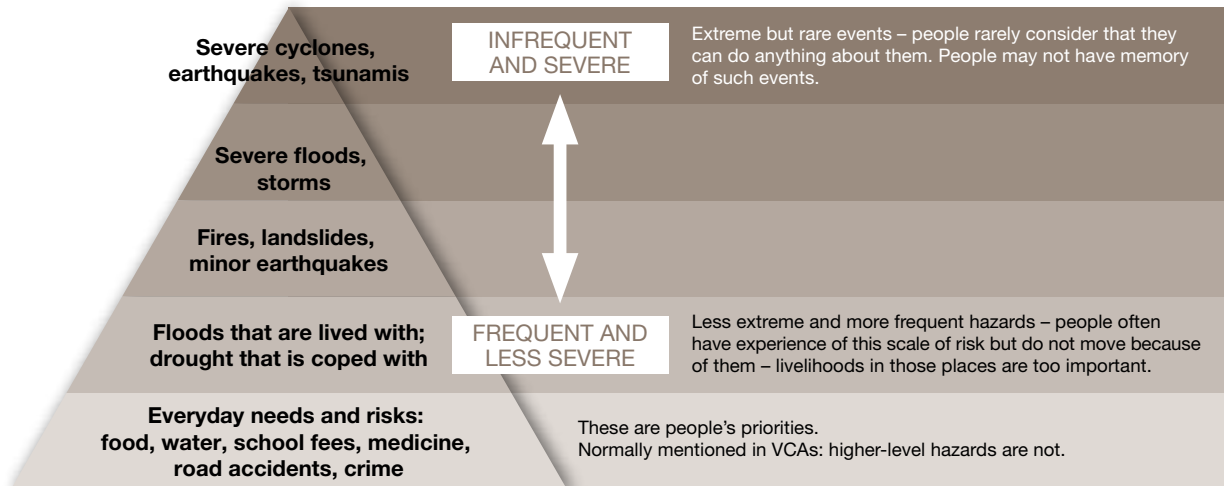
Livelihoods are made up not only of employment opportunities, but a complex interaction of culture and wider factors such as schools, shops, transport access, hospitals and public services. People may be reluctant to move out of dangerous places because of a combination of all these factors. When people are offered alternative livelihood opportunities, this may mean just a new job in a safer place but their livelihood is about much more than just the job. Social capital in particular is a sort of ‘glue’ that may tie people to place, and people’s behaviour is often more related to emotion and psychology (see Box 3.1). DRR organizations need to recognize that they cannot usually offer people the whole livelihood package they require. ■

Culture, livelihoods and risk priorities

Two aspects to living in hazardous locations have many links with ideas of culture and risk perception from the previous chapter. The first aspect relates to different risk priorities: people generally give a very low priority to the serious hazards that DRR agencies try to deal with. They apply much higher significance to problems of everyday life and issues that they have to confront for normal survival, most of which are linked to their livelihoods (see Figure 3.1). Secondly, most people live with risk. They are willing (or forced by poverty) to live in dangerous locations affected by hazards, in order, mainly, to follow their livelihood and earn their living. While DRR and CCA institutions have a culture that is focused on extreme and less frequent events, people give highest priority mostly to everyday needs (see Figure 3.2). The problems of implementing DRR are therefore partly a

‘culture clash’ between two different interpretations of risk. DRR institutions have evolved their own culture that enables them to deal with risks in their own way. The next chapter suggests that this is based on a self-defined institutional rationality that involves these institutions having a faith in interventions that involve ritualized participatory methodologies in which ‘communities’ supposedly accept the priorities of the outside agencies.

Figure 3.1 Risk hierarchy



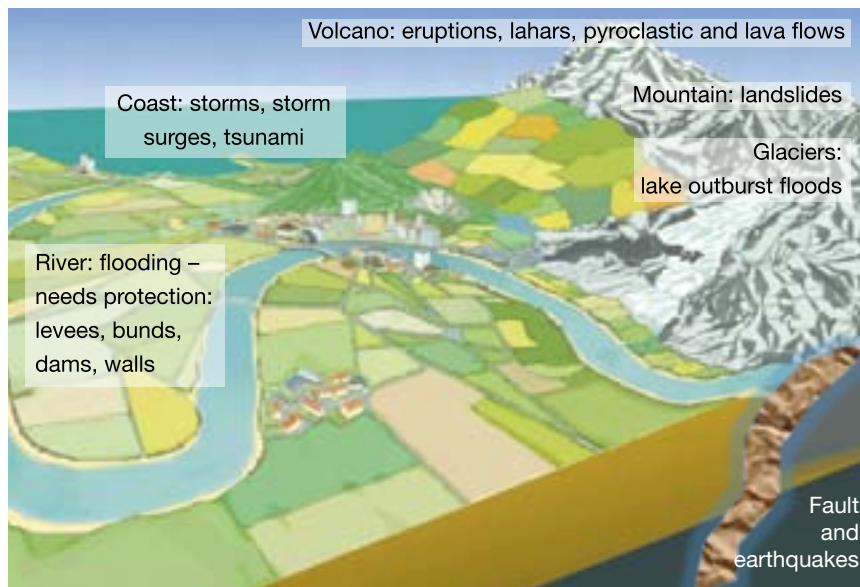
Source: Terry Cannon.

The clash of cultures is shown on one side by DRR institutions that are concerned with high-level, potentially extreme but less frequent hazards that can lead to disasters. This institutional culture considers that people should be focused on preparation for these risks – even when people themselves have other immediate and everyday problems: “You are scratching where we don’t have an itch!” On the other side, most people’s own risk culture gives priority to immediate survival, improved living conditions and dealing with issues that confront them every day: those concerned with livelihoods and immediate needs. One non-governmental organization (NGO) programme that highlighted the link between DRR and livelihoods was Practical Action; its ‘Mainstreaming livelihood-centred approaches to disaster management’ programme operated in five countries from 2006 to 2010.

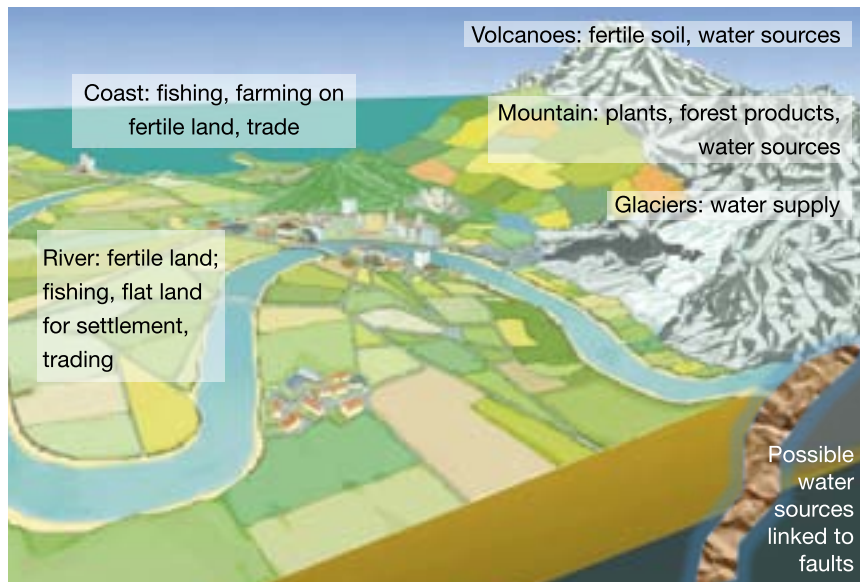
DRR and CCA organizations may think the people who face significant hazards are being irrational when they do not take the risk of disaster seriously. And yet most of the people facing the hazards believe they are being perfectly rational in deciding to be in locations where they can farm, fish, labour, work in a factory and otherwise earn a living. In many cases they even consider it perfectly rational to use precious resources on activities like prayer and offerings or on cultural activities that reinforce social capital and confirm their place-based identity (see Box 3.1). If people

believe that god(s) or spirits can intervene to reduce the risk of a flood or volcanic eruption, it would be irrational not to make offerings and pray. And having such beliefs is also not always related to education or knowledge: people with very high levels of education can share such beliefs and knowledge does not always change people's risk priorities.

Figure 3.2 Two ways to see the landscape: risk or opportunity



The viewpoint of the DRR organization: hazards are obviously the main problem to be dealt with

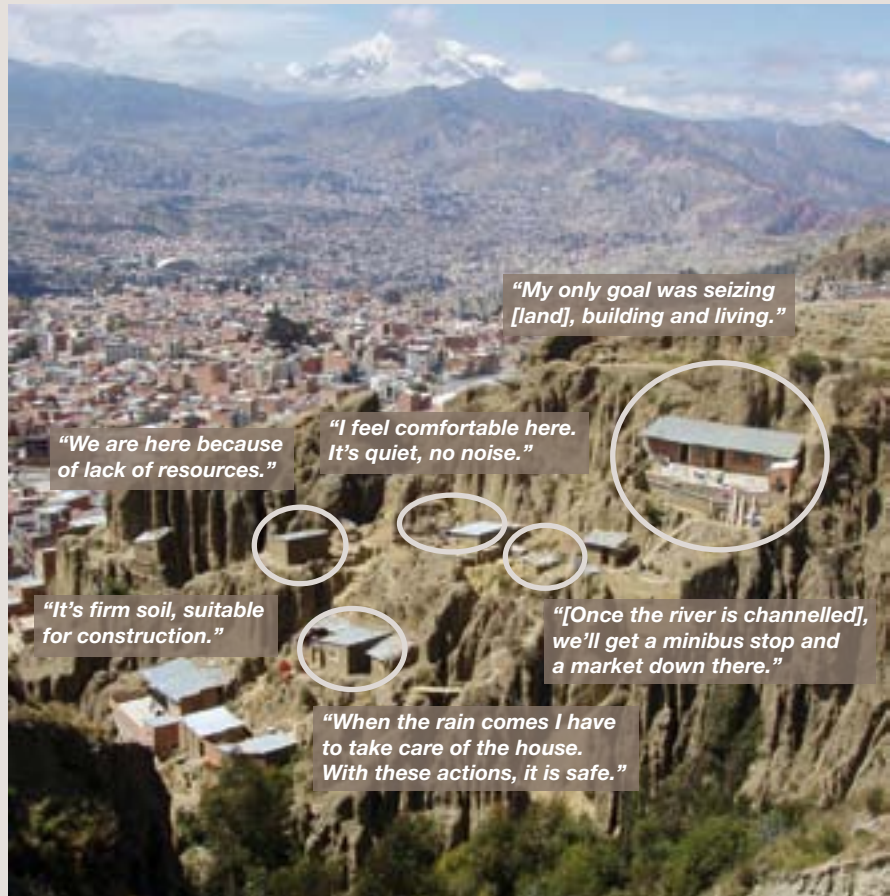


The viewpoint of most people: the landscape is a source of livelihood resources

Source: Terry Cannon; artwork: Matt Bradley.

BOX 3.1 La Paz – how to cope with the slope

At first sight, the people who live in the hills surrounding the city of La Paz in Bolivia seem irrational (see photo below). The men, women, children and even elderly people need to climb along a ravine and river to access their homes every day (at around 3,900 metres above sea level). When it rains, the river is subject to flash floods, which sometimes means that the path home is blocked until the rain ceases. People bought these lands informally and built their homes on top of or between natural ‘chimneys’, as the rock formations are called.



They were initially reluctant to move to these hills, which many thought were unsuitable for construction, and had to overcome their own fears about living in such an apparently dangerous and hostile location. To surmount these uncertainties, they had to reconfigure their feelings by a ‘social taming of their fears’: if one family built a house, then others would follow, thinking it must be safe. Through imitation and collective reassurance, people could justify to themselves that they could occupy these unsafe spaces and make them safe. Indeed, the ravine was settled from the bottom-up. Existing constructions downhill encouraged new buildings higher up and acted as a ‘tranquillizer’ for people’s

fears. Moreover, the new neighbours faced these harsh conditions collectively by deciding that the land could be made suitable for construction by hard group work, which is part of Bolivian popular culture. They motivated each other to find the courage necessary to terrace and level the land. Once settled, some basic self-protection measures (such as building containment walls and stairs, and levelling) and daily risk management during heavy rain allowed them to face risks when they became more manifest. People became gradually 'accustomed' to living there, transforming what was at first exceptional and frightening into a routine and habitual situation. Retrospectively, some declared themselves surprised by their own rashness.

They also appropriated geology, distinguishing between soil types (building on 'firm soil' away from more hazard-prone soils), developing their own expertise with their own methods and criteria. Most dwellers tend to minimize how they perceive the risks and instead focus on positive issues. They consider that the neighbourhood is "a good place to live" because it is quiet and close to downtown La Paz (which reduces transport costs) and has a nice climate and possibilities of neighbourhood improvements.

In fact, the inhabitants have done a lot of work in order to render the place habitable, actively transforming space. However, their changes actually contribute to hazards (through additional weight and waste waters). They adopted a risk perception strategy that involves adjusting their perceptions of the place and its hazards to what they expect from it: hosting their new houses and being gradually urbanized. The ways that the people can remodel their perceptions act as a self-fulfilling prophecy: a reality is created within which they can live. By claiming that "the land is suitable for construction", they actually say that it is possible and legitimate to build on it, which justifies their settlement and enables it to exist.

Indeed, like many others, these inhabitants have struggled for years, hoping to get official status that allows for services from the local authorities such as river channelling, lighting, roads, transportation and even a sports facility. Their goal is to own a house in the city and find a way to earn a living, but their perception of risk is moulded by this goal to enable them to adapt to the risks and ignore the danger. The question is not whether they are conscious or not of the risks; their risk discourse – the stories they are able to construct for themselves to create a strategy to live with the risks – enables them to live in these places and then seek to influence outside actors for practical purposes like services. Their logic is quite rational: it is about their own social progress, life strategy, livelihoods and priorities.

In La Paz, hundreds of thousands people live in similar places on the suburban hill slopes (*laderas*), a substantial proportion of which are at risk of landslides, mudslides, rockfalls and/or flooding. The *laderas* are situated at between 3,700 and 4,000 metres above sea level, and their hazardous topography and geology (erosion and subterranean rivers) make them unsuitable for settlement. However, they are densely populated and nearly every space is occupied, the result of both migrations from rural areas from the 1960s to 1990s and urban growth.

With the expansion of the city, suitable places to live are in very short supply. There is little regulation of the market, and the remaining land is the object of intense speculation, chaotic sales and development. Although selling the land is technically illegal, people are willing to pay a small price to find a place to build in these informal settlements with few public services. It is the housing solution for poor people. These settlements have overwhelmed urban planning, especially in a context of socio-spatial segregation and lack of stability, transparency or long-term management over the last 50 years. As a consequence, disasters have dramatically increased, with losses of life, houses and livelihoods, especially for the poor and lower-middle-class people living in hazardous places.

In the La Paz *ladera*, the people who have settled in hazardous places generally do not show great interest in mitigation activities, but instead give priority to investment in social venues, stairways, sports facilities and better access. There is little interest in geotechnical studies to identify the quality of soils and improve the stability of their homes. Socio-economic hazards are more important to them: lack of savings, unemployment or irregular work, health and water quality, education, satisfaction of basic needs, interpersonal security, family problems and the like. Overall, there is a general precariousness, insecurity and uncertainty which complicates social progress for many people. Even folkloric traditions attract much more attention and investment from households and communities than disaster reduction. People spend a lot of money on these types of events, which have the important function of reinforcing community and citizenship, and contribute to social protection.



People from Tacagua in La Paz's western *ladera*, celebrating the neighbourhood's foundation day. Folkloric traditions are more important for them than reducing the risk of landslides. © Fabien Nathan

A number of people living in hazardous sites in La Paz base their resilience strategy around the acquisition of a house and inclusion in a neighbourhood, "even on top of the mountain", as they say. It provides stability and status and a number of other advantages, compared to the difficulties faced by those who rent. Their resilience strategy is much broader than dealing only with disaster risks. It concerns a range of socio-economic risks that are considered far more significant and urgent. That is why risk perceptions often become embedded in and adapted to strategies for social progress, instead of the obvious (to outsiders) priority of the dangers of the hill slopes. ■

A warning from a DRR organization that people are in a dangerous place is not going to make them move away to 'safety', because they believe that moving is less beneficial than the loss of their livelihoods over the longer term. The idea that information and knowledge will make people behave differently ('rationally') in relation to serious hazards (the 'information deficit model') is discredited. In public health policy, it has long been known that people do not change their behaviour (e.g., in eating habits or for safe sex) simply because they get information (Marteau et al., 2002). The information deficit model is similar to the 'knowledge, attitude, behaviour' model that many NGOs believe is effective in their work. This has also been shown to be inadequate in most aspects of human behaviour, especially in regard to environmental problems and most notably in relation to climate change (van der Linden, 2014; Kolmuss and Agyeman, 2002).

It cannot be assumed that information or even education guarantees that people will face up to the risks that confront them. 'Filling the gap' in knowledge is not the same as understanding (see 'cognitive dissonance' in Glossary below). Culture, psychology and emotion intervene as 'filters' that alter the way information is used to

change attitudes and behaviour. Any new knowledge inevitably has to interact with already-significant attitudes and emotions, rather than providing the means to change attitudes. This means that it does not always produce the intended behavioural outcome (see Know4DRR, 2013, for an interesting discussion of this problem).

To change such beliefs would in many cases mean that individuals have to alter their relationship with neighbours, friends and their 'community' completely. Giving up a belief on the basis of new knowledge affects not only the individuals' own life, but the way that they relate to family and everyone around them. The emotional attachment to perceptions of risk is so strong that it is also difficult to give up because it helps define who someone is and how they live with others. As with other shared cultural practices (for example, polygamy, dowry and female genital mutilation), it is extremely difficult for one person or household to change unless everybody else does so. Wanting to do things differently from your peer group may lead to being disowned and even having problems in pursuing livelihoods.

In some cases governments suggest (or even enforce) evacuation from hazardous places, therefore depriving people of their livelihoods. This is more likely to happen after a serious disaster, when governments believe that they need to take action to protect people from a recurrence of the disaster. This has happened after a number of recent disasters, including the 2004 Indian Ocean tsunami (see Box 1.1), where coastal exclusion zones were established in Sri Lanka (Gamburd, 2011), and after floods in Mozambique. Box 3.2 provides an assessment of the tensions arising because of different goals for flood protection versus livelihoods in Mozambique. An exclusion zone in Aceh, Indonesia, which the government had originally proposed, was abandoned by March 2005 after opposition from the people, partly because of the difficulties of keeping their livelihoods (Kennedy et al., 2007).

BOX 3.2 What are flood plains for? The case of the Lower Zambezi River valley, Mozambique

Flood plains are central to the livelihoods of hundreds of millions of people around the world, but they can also cause loss of life and property: unsurprisingly, they flood. Governments looking to help people live with these risks are faced with two options. First, they can assist people to remain living in flood plains, for example by establishing early warning systems and temporary evacuation procedures. Or, second, and more controversially, they can attempt to move them out of flood-plain areas permanently.

Relocating people as a response to climate shocks and change – particularly flooding – is an approach that has gained considerable interest in recent years (de Sherbinin et al., 2012). The main advantage of relocation is the near-complete removal of people from the flooding threat. Relocation can also provide opportunities for people to have improved housing and state services. However, there are also potentially significant disadvantages for relocated populations. First, there is much evidence to show that resettlement normally impoverishes people who are moved rather than improves their situations (McDowell, 1996).

Second, there is the risk that powerful people might use the threat of climate shocks and change to move people for personal economic and political gain (Barnett and Webber, 2009).

In Mozambique, the history of relocation stretches back to the Portuguese colonial era, as well as the socialist period following independence in 1975. In the past 15 years, a series of major flooding disasters in the south and central regions of the country has resulted in the re-emergence of resettlement policy. One example involves the Lower Zambezi River, which extends over 700 kilometres from the Cahora Bassa dam in central Mozambique to the Indian Ocean. About 3 million people are dependent on this part of the river to sustain their livelihoods. However, in 2007, major flooding displaced 56,000 households out of the valley and into surrounding higher lands. In response, the Mozambican government decided to relocate the displaced people permanently. This allows newly resettled people to live in the 'high area' (*zona alta*), out of the reach of flood waters, and 'commute' to the 'low area' (*zona baixa*) to continue farming. Although the exact number of households moved by government is not known, it runs into the tens of thousands. Some western donors and NGOs have been involved in the resettlement process, either as a DRR, CCA or livelihoods-support response.

The results of Mozambique's resettlement programme are not well understood and a mixed picture emerges for relocated people. The risk of flooding for relocated households is reduced and many people now live in 'improved' concrete houses close to major roads. But new risks have arisen, such as an increase in crime in resettlement areas and a range of cultural problems, including toilet-sharing in close confines. Some relocated communities appear to be better off overall, whereas others have done quite badly, particularly those whose inhabitants have to travel long distances to reach their farms. And within communities, the outcomes of relocation appear to be dependent on social status, with relatively better-off households more capable of benefiting from their new surroundings in the high area than poorer ones (Artur and Hillhorst, 2014). The disadvantages that poorer households face can lead to their abandoning resettlement areas after they have been relocated (Arnall et al., 2013).

Beyond the immediate livelihoods impacts of the resettlement programme, there is controversy about the reasons why the Zambezi River is increasingly erratic and the best way to respond to the resulting large-scale displacements of people. Some Mozambican NGOs argue that worsening floods in recent years are mostly the result of dam construction up-river, and not natural or climate change-related fluctuations (Justiça Ambiental, 2011). Other commentators point out that the present-day resettlement programme, in addition to being viewed as a DRR strategy, should be recognized as the result of a Mozambican legacy to control and 'regulate' dispersed rural populations dating from the country's colonial and socialist eras (Arnall, 2013). These alternative perspectives raise important questions about the equity of economic development in the Lower Zambezi River valley, and who wins and who loses as a result of DRR policies.

This example from Mozambique raises a number of important lessons for governments and development agencies looking to help poor and vulnerable people cope with flooding. First, it should be recognized that flood plains are inherently risky and, for many people, the benefits that rivers provide outweigh the risks of inundation. Second, resettlement of people out of flood plains is a precarious strategy at best and should generally be viewed as a measure of last resort. Third, organizations need to remain alert to the political dimensions of DRR and ensure that interventions carried out in its name are not unduly appropriated by wider interests. ■

In an article in the Humanitarian Practice Network newsletter on post-tsunami construction in Aceh and Sri Lanka, Kennedy et al. (2007) reported that:

“To avoid recreating tsunami vulnerability, exclusion zones for coastal redevelopment were mandated in Sri Lanka and, to a lesser extent, in Aceh... Moreover, while exclusion zones generally reduce the risks from future tsunamis and other coastal floods, failing to conduct proper assessments in new sites could increase exposure to other hazards. This approach also damages livelihoods that depend on living by the sea. In some cases, there were accusations that exclusion zones were imposed so that the coastal land could be used for other purposes, such as building hotels.”

This again is a clash of cultures: between the disaster agencies who can only see the significance of the hazards and the people whose priority is livelihoods. Given that many people are willing or compelled by poverty to live in dangerous places to gain their livelihoods, the implications of livelihoods for DRR and CCA policies must clearly be taken very seriously. Another illustration of this is the reluctance of many people to evacuate from danger when they receive a hazard warning. They fear theft of their property or loss of their assets which cannot be easily replaced if the hazard strikes. The damage to their livelihood from a false alarm may be as bad as if the hazard had actually struck. This problem is especially difficult when people have experienced early warnings that were inaccurate.

People's livelihoods are their first 'line of defence' against disasters: it is the basis for their nutrition, their baseline status and their general health and welfare (Cannon, 2008; Feinstein International Center, 2013). Livelihoods determine the educational level they are able to secure for their children. A successful livelihood is also the basis for people's capacity to protect themselves from hazards – to construct the right type of home in a safe location. Even when they have the income many people will not necessarily protect themselves. Their interpretation of risk is such that livelihood takes priority, and spending of income is not related to risk reduction (see Box 3.1). The quality of a house and its location (especially in the countryside where they are normally self-built) are determined by the cultural attitudes to risk (see Chapter 5). Why incorporate safety features if a disaster is an act of god(s) or regarded as unlikely, or where the cost of the improvements are not considered worthwhile compared with the other things that money can be spent on?

A further set of problems can arise when different groups of people occupy the same territory, but with very different ideas of how to use the resources for their livelihoods. Culturally, different groups (especially from different ethnicities and histories) may perceive environmental resources in different ways. One group may destroy some resources (e.g., forest) to carry out one type of activity when

that resource is essential to another group. Moreover, the way that resources are used can lead to increased hazards, perhaps where deforestation leads to downstream flooding. This type of culture clash is explained in Box 3.3 on biodiversity and ethnicity for a region of Ecuador.

BOX 3.3 Loss of rainforests and biodiversity: a disaster for 'indigenous communities'?

Many so-called 'environmental problems' are generated by the culture-specific relationship between people and their natural environments in regard to their livelihoods. Sometimes the problems arise because of very different ideas about what the environment can be used for and one group's attitude may conflict with the needs of another. This case study from Ecuador shows how indigenous peoples perceive a drastic change in their natural environment, their lifeworld and livelihoods. Perceived changes, however, are not uniform among and within the groups or communities studied.

The tropical mountain rainforests of the eastern Andean slopes in southern Ecuador have been identified as one of the 'mega-hotspots' of biodiversity worldwide. But in recent decades, these sensitive ecosystems have come under enormous pressure due to agricultural land expansion (especially for grazing pasture), timber extraction, mining activities, water extraction, road construction and other forms of human interference. Indigenous Shuar and Saraguros as well as mestizos (a term generally used to indicate people of mixed Spanish and indigenous descent) are settling in the research area, the Nangaritza valley, in the Amazon foothills of the Andes. The Shuar belong to the Amazonian indigenous groups and are the native people of the valley. They are traditionally forest dwellers settling in the lower parts of the tropical mountain forests at 900 to 1,400 metres. They practise shifting cultivation in a subsistence economy and also fish, hunt and gather forest products. The Saraguros are Quechua-speaking highland people who live as agro-pastoralists for the most part in the temperate mid-altitudes of the Andes (1,700 to 2,800 metres). The Saraguros and the mestizos came to the Nangaritza valley as smallholder colonists to log timber and practise cattle ranching and agriculture. Since their arrival in the last two decades they have converted large areas of rainforest into almost treeless pastures.

As recent studies in southern Ecuador show, ethnic-cultural identity is one driving factor in the relationship between humans and their environment (Gerique, 2011; Pohle et al., 2010). There are fundamental differences between the indigenous Shuar and Saraguros in their attitude towards the tropical rainforest and what it means to them. These differences affect the management of forest resources and the perceptions of environmental risks. But these conflicting attitudes are also apparent in wider economic and social activities including all strategies for maintaining livelihoods. In 2011, a livelihood and perception survey of environmental, economic and social stresses was conducted in 73 households in six settlements in the Nangaritza valley. The communities were either homogeneous Shuar *centros* or mixed communities of Shuar, Saraguro and mestizo. The survey clearly revealed that the colonization and deforestation process is an enormous threat to the Shuar's traditional livelihoods and resource-use systems. The *colonos*, or colonists', conversion of forests into pasture reduces available land for slash-and-burn agriculture, the basis of the Shuar's subsistence production. Selective timber logging mainly practised by *colonos* reduces tree species

which are used for house construction and fruit gathering. There is a reported increase in irregular high river levels causing catastrophic flooding and claiming lives, which cannot yet be traced to deforestation and still needs further investigation.

Aerial photo and satellite image interpretation in the Nangaritza valley shows that, compared with 2000, the tropical forests in 2010 were reduced in area by almost half. The pasture area increased by 15 per cent and the cultivated area increased by almost 13 per cent (Pohle et al., 2012). Among the groups studied, this loss of forests was, however, not seen equally as a negative factor, a risk or even a disaster. For the Shuar, as forest-dependent people, colonization and deforestation clearly mean loss of land (territory), loss of animal and plant species for housing, hunting and gathering and, as such, loss of their traditional way of life which is still based on a sense of being closely bound to the forest culturally, spiritually and economically. For the Shuar, deforestation means a loss of cultural identity. But for the Saraguros, it is a gain in opportunity, a strategy to secure livelihoods as pastoralists and farmers.

Some Shuar households are also changing: they have adopted the pastoralist activities of their colonist neighbours and are becoming integrated into the market economy. Although monetary income mainly stems from selling agricultural products, several Shuar households reported cattle ranching as the main income source, while others named timber logging and small-scale mining. As the price for gold rose dramatically after the global financial crisis, controversial attitudes towards small-scale gold mining in their territories even caused a division of Shuar communities into conservationists and mining protagonists.

The study shows that indigenous ethnic-cultural groups living in the same locality can have very different ideas about how to deal with forests and resources. Community-based approaches to nature conservation, sustainable development or risk reduction have to be aware of ethnic-cultural, social and economic differences both among and within the groups or communities studied. While the loss of forests and biodiversity involves the loss of identity for some, it means opportunities to sustain livelihoods for others.

It is also evident that the notion of indigenous peoples living in harmony with nature is as much a romantic idea as the idealized concept of community as an entity of people who share the same culture, values and livelihood strategies. The example of the Shuar shows that there is a tendency to break into other groupings when it comes to economic adaptation and coping. The Shuar's identity-forming function of the forest seems to be decreasing steadily with the loss of their ancestral forest resources. This also means that the idea of culture is not fixed but changes constantly in relation to opportunities, resources, competition and changing boundaries. According to Radcliffe (2006), "Culture and development refers to the fact that culture is not primordial but is reworked and reproduced around and through development..."

As indicated in Chapter 1, there are many kinds of events that different people consider to be disasters. Sometimes it is not the effects of natural hazards that are most relevant to damaging people's lives and livelihoods: when competing groups perceive a natural resource in different ways it can be a disaster for those who lose. And sometimes the damage done to the natural environment in order to pursue livelihoods may be responsible for making some hazards (e.g., floods) worse or more frequent. The last connection cannot yet be proved in the study area, but is apparent in other parts of the world where similar competition over resources is taking place. ■

Culture and livelihoods: different risk priorities

When people are asked, for instance through participatory community risk assessments, what their problems are, very few respond with the risks that outsiders are concerned about and which can, of course, lead to serious disasters. Most people have a completely different set of risk priorities. The evidence for this comes from the many local risk assessments carried out around the world by the Red Cross Red Crescent and other NGOs (see Figure 3.1 above).

These assessments are done normally using participatory methods that are very similar in most NGOs, such as the IFRC's Vulnerability and Capacity Assessments (VCAs). In hardly any of these assessments do people include serious hazards in their list of risks. While men, women and children (when asked separately) often have different lists and priorities, it is very rare for any of them to include earthquakes, floods, hurricanes or other sudden-onset hazards. Although no combined reviews of the results of VCA-type assessments have been published, evidence for this comes from IFRC reviews of the VCA system in 2006 and 2012, and from discussions with Red Cross Red Crescent and NGO staff from many countries, who have confirmed that people's risk hierarchy hardly ever includes the severe hazards that DRR agencies focus on.

For example, in 2004, the Yemen Red Crescent Society carried out some VCAs with the IFRC in two areas that had recently suffered flash floods (IFRC, 2006). The intention was to promote participatory activities for flood preparedness. After some months working with the people, they created a road safety programme! People identified the day-to-day, small-scale disasters of death and injury on the roads as much more significant than floods, which might not recur for a very long time.

In another extreme example, postgraduates studying DRR at Copenhagen University went on a field visit to Bangladesh in 2010, just six months after Cyclone Aila had devastated much of the coast in the south of the country (and neighbouring India). They visited a coastal village in the Sundarban mangrove forest, home to the Bengal tiger. The area was hit not only by Aila in 2009 but also Cyclone Sidr in 2007. When asked what risks they faced, it was the daily risks that outweighed those of the cyclones. Top of their list was drinking water (too salty), next was attacks by pirates, and third was the risk of being eaten by tigers (unpublished field reports, 2010). In many parts of the world, recurrent hazards are incorporated into normal life (through 'coping' strategies), such as the many people who 'live with floods'. In parts of Viet Nam, certain vegetables can only be grown in flood waters, and people look forward to eating and selling them. In both Bangladesh and Viet Nam, over hundreds of years farmers developed varieties of 'floating rice' that actually grow with the slow-onset floods and are harvested from boats. Unfortunately, these are disappearing with the dominance of high-yield varieties, and it is essential that the traditional crop varieties are rediscovered to help with climate change.

Many DRR institutions do not change their projects to fit local people's own priorities, and in many cases the external priority given to the severe hazard can be imposed on the local people. Risk assessments like VCA are often carried out with a predetermined hazard in the minds of the DRR organization or their donor. So even if local people prefer to fix their water supply or reduce malaria, they get incorporated into the disaster risk project anyway. A significant part of this mismatch is that DRR organizations approach local people based on funding they have obtained for dealing with certain hazards and not for other types of problems that the people themselves might prioritize.

It is, of course, true that the people do face the severe hazards that the DRR organization is hoping to deal with. When VCA investigations are carried out, it is possible that people restrict their responses about the risks they face to exclude serious hazards. For example, people may fail to mention extreme events because they don't think it is possible to do very much about them, or they have made 'cultural' adjustments to them and are fatalistic or accept them as god's will. They may, therefore, focus on problems that they think the outsiders can help with, and assume that little can be done about the big disasters. And, even if this is true, it just leads back to the significance of culture. If people are not interested in disaster preparedness because they make 'cultural' adjustments to live with the risks, it makes the role of DRR institutions quite difficult.

Instead of being interested in floods, hurricanes, tsunamis and earthquakes, people typically mention immediate and everyday problems like food on their plate, paying school fees, getting water, crime, road 'accidents' and so on. Some analysis of disaster preparedness suggests that there is little point in trying to engage people in DRR activities until these other difficulties have been resolved. DRR must be linked to broader development priorities if it is to succeed (Wisner et al., 2004; Blaikie et al., 1996; Shepherd et al., 2013; DFID, 2005; UNDP, 2004). It is difficult for DRR (and CCA) interventions to respond to this clash of priorities: by definition the organizations concerned are boxed into dealing with severe risks, not the problems of everyday survival, livelihoods and development. They have normally applied for funding that has restricted uses, and disasters get divorced from development partly because of the funding mechanisms.

The need to make better connections between disasters and development was partly acknowledged in the Hyogo Framework for Action and more so in the Intergovernmental Panel on Climate Change's special report on extreme events (IPCC, 2012). Better integration is being proposed for the post-Hyogo framework and the successors to the Millennium Development Goals (UNISDR, 2014; Mitchell, 2012; Mitchell et al., 2013). The goal for DRR and CCA institutions must be to find ways that work at the local level so that people can both deal with their everyday needs and have better livelihoods, while also enabling them to take extreme

hazards into account. This means that people have to be confident that extreme events can be dealt with, which in turn requires DRR institutions to demonstrate cultural sensitivity so that they do not appear to be treating local people as irrational and superstitious. Where culture is a possible barrier to people thinking they can (or should) be able to reduce the effects of serious hazards, then it needs to be fully taken into account.

Cultural adjustments to living with risk

The frequency and severity of hazards – and the number of vulnerable people who will be exposed to them – is expected to rise with climate change. It will also bring an increase in other hazards, including heatwaves and wildfires, and possibly cold waves, as well as new and spreading diseases and pests. Climate change is also damaging the rural livelihoods of billions of people through the effects of changes in temperature, rainfall and seasonality. This is making more people vulnerable to all types of hazards, not only those linked to climate.

Hundreds of millions of people are, therefore, 'condemned' to live with risk, to be made vulnerable to the hazards by social processes and to suffer the effects of human-made climate change in both daily climate trends and extreme events. So whatever is done to reduce disaster risks, it must take place in this context where people are living with risk. And the first point of contact is their livelihoods, and how these can be made stronger, safer and where necessary replaced (for instance, in places where there is uncertainty for the future and where villages, towns or even cities will become uninhabitable) (Cannon, 2014; FAO, 2013).

People live with risk even when they know about previous disasters, and may even want to return to their homes after a disaster to the same place that they are aware is still dangerous. The UK newspaper *The Guardian* reported that six months after Typhoon Haiyan struck the Philippines, the authorities in the badly-hit city of Tacloban are imposing a no-build zone in dangerous areas and fund-raising for new housing in safe areas. Not everybody is happy, since it will remove people from their livelihoods. Jaime Boctot, who lost 14 of his family, rebuilt his home in the same place right by the sea. He is quoted saying, "My life has been spent near the sea. I have worked as a diver all my life. I don't know what to do if that is taken away from me." He is one of thousands of people living in areas designated as no-build zones. *The Guardian* reports that city officials estimate that under the new no-build rules 200,000 people may need to be resettled (Lowe, 2014). The power of attachment to a place is of immense significance for many people and could be considered one of the major cultural challenges for DRR. At the moment, this is not taken into account enough in DRR and CCA, and knowledge from other disciplines is not being used to inform what is done.

Bocot's story is a good example of 'territorial functioning', a concept used in sociology in relation to people's behaviour where they show the importance they attach to (and their ability to function in) particular places (Taylor, 1988; see Glossary below). It is primarily a defensive mechanism that enables people to maintain emotional stability in the face of change. It has links with the idea of 'ontological security', which refers to the way that a stable mental state can be maintained by having connections with place (see Glossary). Through a sense of identification with a particular location, people can maintain emotional continuity in their lives. A classic example of this in relation to disasters relates to the town of Yungay in Peru, studied by Oliver-Smith (1979; 1986). Despite being destroyed by a landslide triggered by an earthquake in 1970, many of the citizens campaigned to rebuild the town in exactly the same location, even though there was still a danger of more landslides.

Another relevant concept is 'cognitive dissonance' (see Glossary), which is a term used to describe the emotional stress that people suffer when they are forced to live with two contradictory ideas. Instead of being in emotional harmony (as they would be if there was no clash between what they want and the barriers to that), people experience a 'dissonance' in their mind – a clash that upsets them – because they cannot control all their circumstances. This is what can happen when people live with risk, for example to gain their livelihoods and make their living. Because the hazard can actually happen, and they are aware of this possibility, they have to cope mentally with the fact that they live with the possibility of disaster. This can also mean that information (for instance, about the hazard) is ignored because it will increase the stress of the dissonance: "When dissonance is present, in addition to trying to reduce it, the person will actively avoid situations and information which would likely increase the dissonance" (Festinger, 1957). This also shows why providing information about risks (or climate change) can have the opposite effect from that intended, because it simply reinforces the emotional resistance to the idea that someone is in danger.

An ancient version of cognitive dissonance is Aesop's fable of the fox who wanted some delicious-looking grapes he could see but not reach (see Glossary). The fox coped with this clash by denying that they were any good, declaring that they must be sour grapes. In the same way, people deal with the upset of knowing they live with danger by constructing cultural (and therefore shared) ideas about what causes the hazard, and the possibility of religious interventions that can inform them of what to do (see Box 2.3), faith in technologies that can protect them (see Box 2.2) or acceptance of god's will or being fatalistic. For a DRR organization to intervene and inform people that they are going to do something about the hazard for disaster preparedness requires the people to abandon 'irrational' ideas they share and have held in good faith for a very long time. It is those who attempt to impose

their own rationality in such circumstances that are in danger of being irrational. As Dr Rance, a character in Joe Orton's play, *What the butler saw*, says: "You can't be a rationalist in an irrational world. It's irrational."

Culture and beliefs can function like this in religious interpretations of the hazard. People accommodate to the danger of the risk by believing something that makes it easier to bear the disturbing dissonance. Beliefs are therefore part of the process by which people are able to reduce the distress, the cognitive dissonance that goes with living at risk. The culture that is used to do this accepts that it is outside of people's own control, but has other sources of control (god, spirits, technology) that can be a support. Briones (2012) suggests that there are even parallels in this process between what happens in 'traditional' and 'modern' societies, with shaman and meteorologists performing a similar function of reducing uncertainty and providing an explanation:

"If 'traditional' societies do it through magical-religious practices, 'modern' societies do it through forecasts. Even with these different epistemological approaches, shamans and meteorologists fulfil the function of interpreters to reduce climatic uncertainty." (Briones, 2012; unofficial translation.)

What is interesting is how little DRR or CCA institutions have learned from other disciplines (such as psychology, sociology and anthropology) where the concepts outlined here are well known and have been used to help explain people's behaviour for many years. Related attempts to bridge the divide and combine the different belief systems arise from recent projects that seek to bring together traditional weather forecasters and 'rainmakers' in Africa with the meteorological services (see Box 3.4).

BOX 3.4 Fitting it together: tradition, modernity and predicting the weather

For many people in the semi-arid and arid lands of Kenya, livelihoods are primarily agro-pastoralist- and pastoralist-based. A typical agro-pastoralist family, for example, combines smallholdings of semi-subsistence and rain-fed crops with keeping livestock. People are aware that the timing of the seasons is variable and appears to have become more so. To ensure food security for the season, the families require information and advice upon which to base a number of key decisions. For pastoralists, these include what types of animals and livestock to keep and sell for the season, when to migrate for grazing pastures and which routes to take, how to select alternative livelihood options, when and how to manage pests and diseases, how to evade livestock losses, when to restock and when to return animals to kin. Smallholders need to decide which crops and seed varieties to plant, when to plant, when to apply fertilizer and/or pesticides, when to weed, when to harvest, when to dry and winnow, how and when to store and which market has the best prices.

Decisions on these activities are typically based on culture, the behaviour of others and discussion about what the coming season may be like. Information for this comes from a variety of local,

traditional and scientific sources. The degree of confidence in weather forecasts comes from the reliability of their past performance, understanding of the probabilistic nature of the forecasts and the credibility of the institution providing the forecast. Confidence in scientifically-derived forecasts is low in many parts of Kenya. Furthermore, the use of forecasting at daily, weekly and seasonal timescales is not integrated with understanding about longer-term trends in climate variability and change.

In response to these barriers, the Adaptation (Ada) Consortium, funded by the United Kingdom's Department for International Development, has been tasked with introducing a 'combined approach' to adaptation in northern Kenya, in particular in the arid and semi-arid lands of Isiolo, Wajir, Garissa, Kitui and Makeuni counties. This combined approach consists of establishing county-level adaptation funds to support:

- community-prioritized adaptations to climate variability and change
- development of user-relevant climate information services
- integration of weather and climate information and resilience assessment tools into county and community planning
- establishment of county and ward adaptation planning committees
- development of a robust monitoring, evaluation and learning framework.

Discussion with a range of users, such as different livelihood groups and decision-makers from across line ministries, shows there is reluctance to use current climate information. This derives from concerns about the sparse observational network, with users aware that the nearest weather station is often far from their area and unable to provide locally reliable forecasts. Other issues concern the lack of awareness of the probabilistic nature of the information provided by forecasts, supplied through channels and in formats that are not helpful for local decisions and timeframes. While most authorities and community leaders strongly endorse efforts to develop more user-relevant climate information services, a small minority do not welcome scientific forecasts. They see it as attempting to supplant powers reserved to god. The systematic integration of relevant scientific understandings of risk within decision-making across scale and sectors requires a significant cultural change, coupled with the development of more reliable, relevant and usable information.

Bringing together local and scientific information can support different levels and types of integration, from increasing respect for each other's knowledge sources, developing more relevant formats and channels for provision of information, to strengthening the reliability and relevance of the climate information provided. A number of approaches to support co-production of climate information have been tried in the project. For example, work is under way to assess how local knowledge can support the development and downscaling, communication and uptake of county forecasts through the collection of oral histories of local observations and traditional forecasts, and time series of local meteorological observations and scientific forecasts.

There have been attempts to compare scientific and indigenous knowledge before, but they can be problematic as they often refer to different things. For example, "Indigenous observers [can] base their conclusions on multiple environmental and social factors that they consider in an integrated manner (e.g. wind speed, direction and variability, combined with temperature and precipitation, as well as the need for shelter and safety when travelling with or without family). In contrast, scientists may isolate a single environmental variable (e.g. temperature or wind speed) and reach broader conclusions based upon an extrapolation from this narrow data set" (Weatherhead, Gearheard and Barry, 2010). The outcome

of a comparison of these different sources of knowledge can be that there appears to be more disagreement than actually exists. The work of the Ada Consortium is seeking to provide a two-way comparison between local observations and indigenous indicators, and scientific observations and forecasts. This involves linking local observations from a selection of years with similar scientific observations to derive ways of translating time series of observations and forecasts from one knowledge source to another and including the uncertainty in doing so. This process of comparison aims to develop dialogue and trust between different sources of climate knowledge and knowledge providers. It also seeks to provide some form of validation of different forecasting products in terms of local and scientific climate conceptualizations. Integrating traditional and local knowledge on climate with scientific forecasts will result in usable climate information that is locally relevant and culturally valid. This, in turn, will support decisions aimed at improving adaptation to climate variability and change to be more appropriately informed by science. ■

Conclusion

These very significant aspects of people's behaviour – risk priorities and livelihood focus – are often not incorporated in the design of DRR programmes and projects. Unless much more attention and respect is given to people's own priorities, behaviours and belief systems, it is highly unlikely that DRR and CCA can make enough impact. A much closer match is needed between the two 'rationalities' so that it becomes possible to support people-based projects for reducing risks, especially as risks increase with climate change. Along with that, the significance of culture must be understood and incorporated into any attempt to deal with natural hazards, rather than being treated as an inconvenient and illogical 'extra'. The importance of this for disaster preparedness and post-disaster recovery is shown in Box 3.5 from the Red Cross Red Crescent Livelihoods Centre.

A lack of effectiveness in DRR is now of even greater concern because of climate change and its effects on frequency and/or intensity of climate-related hazards. Climate-related hazards are also likely to affect more people and new locations. Climate change (not extremes, but changing trends) will also increase the number of people who are vulnerable to all types of hazards, including geo-tectonic. Rising temperatures and altered patterns and quantities of rainfall will harm the livelihoods of billions of people who are 'climate dependent', including some who are not currently regarded as poor. This will be the case especially in rural livelihoods in low- and middle-income countries. This makes it imperative that disaster risk reduction is made even more effective than it currently is. Given that many people want or have to live in dangerous places, it is essential that any attempts to prepare for disasters and climate change are rooted in an understanding of the complex priorities that people have that fall outside the 'disaster box'. Actions to reduce disaster risk that fail to account for people's cultural perspectives, local priorities and living with risk are not likely to be effective.

This means that it is essential for DRR and CCA to confront the cultural issues that affect people's willingness to take risks (or inability to avoid risks) and the dangers they face. And the key issue is that in many cases, places and situations, people will want to continue to live with risks in order to pursue their livelihoods, even when they know about the hazards they face, have already suffered from them and become aware that the risks will increase with climate change.

BOX 3.5 Linking livelihoods with disaster risk reduction

When a disaster strikes, figures start to flow: number of people injured or dead, houses and infrastructure damaged or destroyed, and estimates of millions in economic losses. Behind these figures, there are always personal stories that bring home the real extent of the tragedy. Crops lost and therefore no income for immediate basic needs and also less capacity to recover and restart the next harvest. People injured without basic healthcare, so they cannot go back to their jobs. Equipment and goods wrecked and little or no savings to acquire the necessary assets to reassume activity.

People are often forced to live in hazard-prone areas for many reasons: unequal access to land, lack of education, precarious jobs, power relations, laws that are not conducive to entrepreneurship, lack of flexible microfinance schemes. And often the lack of opportunities, the perception of risk and immediate survival needs prevent people from even dreaming of living somewhere else or developing alternative economic activities.

The importance of integrating livelihoods in the very early stages of emergency response and recovery is increasingly recognized by many humanitarian actors. However, the gap between recognition and real practice is huge. The response to Typhoon Haiyan in the Philippines is an interesting example. On the one hand, it shows the growing recognition of livelihoods interventions in the aftermath of a disaster. Planned interventions seem to support livelihoods from an early stage and some, part of the government's reconstruction plan, are aiming at restoring, strengthening and diversifying livelihoods. On the other hand, it also calls for reflection: why were people's livelihoods so vulnerable? To what extent will reconstruction policies properly address people's livelihoods? Policies to establish no-build zones in risk areas will force families to resettle in new areas where there are little or no livelihoods opportunities.

Other challenges present problems in mainstreaming livelihoods in DRR and CCA. There are already a great variety of hazards, and climate change is causing an increase in their frequency and/or intensity. Integrating livelihoods in DRR is a critical strategy to help people to be protected from disasters, prepared for them when they do strike and recover from their impact. Although disasters affect a wide variety of countries and populations, their effects on the poor are usually greater.

Some of the challenges to link livelihoods and DRR are:

- A lack of evidence to show results and good practice, especially to demonstrate the long-term benefits of investing in preparedness to protect and restore people's livelihoods.
- Many approaches and methodologies have been developed for rural areas and wrongly translated to urban settings in which people's assets and coping strategies may differ significantly.

- The need for good understanding of the livelihood context to enable a proper response and alternative analysis. It is important to consider how different groups such as women, youth, the elderly or the disabled are affected, and what their livelihoods strategies and challenges can be.
- Current DRR programming sometimes focuses mainly on natural hazards and does not properly consider the diversity of risks that households face, including other factors such as poverty or conflict.
- There is still limited funding for DRR compared to funding available to relief efforts.

There are already interesting examples to show that simple actions can actually link livelihoods and DRR. Supported by the Spanish Red Cross, the Ethiopian Red Cross Society has been implementing livelihoods projects with strong components of preparedness and environmental conservation in Mekdela and Menz Gera *woredas* (provinces) in Amhara region. These areas are exposed to cyclical drought (over periods of 6–8 years) and the land has suffered inappropriate exploitation leading to environmental degradation, loss of productivity and decreasing capacity to cope with recurrent droughts. Although rains are scarce, the environmental degradation and the lack of appropriate infrastructure to capture and channel water not only prevented a better use of water but also damaged arable lands and crops downstream. Relying mainly on agriculture, the local people suffered from chronic food insecurity that was made worse by the periodic droughts. The projects combine the following measures that aim to improve food security and enhance people's capacity to cope with frosts, rains and drought:

- Environmental protection, including hillside terraces, soil and stone boundaries, drainage channels, pits for planting seedlings, check-dam gabions, drainage channels and reforestation.
- Improved water conservation and use, with irrigation pumps, construction of different water points for human consumption, washing and livestock, community organization and training.
- Improved agricultural productivity, with distribution of seeds, household and community tools, introduction of new crops and training for handling, storage and preparation.
- Improvement of livestock productivity, with distribution of livestock and training on animal care.

All these actions were implemented in close coordination with the local authorities and included a food- and cash-for-work component in all community infrastructures. An external evaluation concluded that results are outstanding in soil restoration, access to clean and safe water, households' income and their capacity to cope with contingencies. Indicators that show the benefits include changes in spending patterns, dietary diversification, better time management for women, and housing improvements. However the evaluation also showed the need to integrate a stronger component on gender and sanitation improvement.

If more funding is invested in good-quality livelihoods protection and preparedness, the costs of disaster response and recovery can be significantly reduced. Inspired by the belief that more and better livelihoods interventions are needed to reduce vulnerability, the IFRC and the Spanish Red Cross established the Livelihoods Centre with the initial support of Accenture Foundation. Its mission is to assist Red Cross and Red Crescent National Societies to increase awareness and use effective livelihoods strategies to improve people's capacity, skills and practices. Through this, it aims to maintain and restore livelihoods so that people's living conditions are much more secure. ■

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Glossary

Aesop's fables

Aesop supposedly lived in ancient Greece in the 6th century BC and is famous for his story-telling and fables. The fox and the grapes fable has passed into modern usage. For instance, when someone says that they didn't want something that they clearly did (such as a job they applied for and did not get), one says that it is sour grapes.

Cognitive dissonance

Cognitive relates to the operation of the mind to comprehend reality, and the processes that are happening in the brain to interpret a person's environment in the context of the physical processes of the brain. Dissonance means literally a sound that is harsh, clashing and unpleasant. In psychology it means the way that people feel uncomfortable with a particular situation that causes them to feel a clash or painful emotion. Cognitive dissonance is used mainly in psychology to describe the clashing, conflicting state of mind that arises when a person believes one thing and understands that reality may be contradicting it. "Cognitive dissonance is the excessive mental stress and discomfort experienced by an individual who holds two or more contradictory beliefs, ideas, or values at the same time or is confronted by new information that conflicts with existing beliefs, ideas, or values."

Wikipedia, http://en.wikipedia.org/wiki/Cognitive_dissonance (accessed 8 June 2014).

Ontological security

"Ontological security is a stable mental state derived from a sense of continuity in regard to the events in one's life. Giddens (1991) refers to ontological security as a sense of order and continuity in regard to an individual's experiences. He argues that this is reliant on people's ability to give meaning to their lives. Meaning is found in experiencing positive and stable emotions, and by avoiding chaos and anxiety (ibid; Elias, 1985). If an event occurs that is not consistent with the meaning of an individual's life, this will threaten that individual's ontological security. Ontological security also involves having a positive view of self, the world and the future."

Wikipedia, http://en.wikipedia.org/wiki/Ontological_security (accessed 8 June 2014).

Ontology

This technical term needs explaining because it is used in ‘ontological security’. Ontology is used mainly in philosophy and social science methodology to relate to the process of understanding real things, what exists and how people categorize reality. (By contrast, epistemology is the understanding of things: the conceptual and analytical methods that individuals construct in order to understand reality). Briefly, ontology relates to reality and epistemology relates to how people understand reality. Ontological security is, therefore, a term that is used to define the reality of existence of people in the context of how safe, ordered and meaningful their lives are.

Territorial functioning

This “refers to an interlocked system of sentiments, cognitions, and behaviors that are highly place-specific, and socially and culturally determined and maintaining.” Taylor (1988) “explores the consequences of human territorial functioning for individuals, small groups, and the ecological systems in which they operate”. ■

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The myth of community?

Many organizations that deal with disaster risk reduction (DRR) and climate change adaptation (CCA) have developed their own behaviour, values and attitudes that constitute a culture that is sometimes built on faith rather than evidence. This chapter examines institutional culture, especially in relation to the use of the concept 'community', and argues that it is harming the effectiveness of outside support. The chapter focuses mainly on what the authors consider to be a misplaced belief in 'community' and the 'participation' that normally goes with it.

Most non-governmental organizations (NGOs), the Red Cross Red Crescent and many international organizations use 'community' widely and it is often the preferred terminology even when it is possible instead to refer to 'people' or 'location'. The word has acquired a mythic value and entered the standard jargon of DRR, CCA and development more generally. It has problems of dangerous assumptions about the potential for benign behaviour and collaboration that may not be valid. 'Community' is often used uncritically (as are the words resilience, sustainable, marginalized and so on) because it is embedded in the institutional culture. It is intended to convey two things that legitimize the organization and its work. The first is the confirmation that it is being done with real people at the local scale and is not 'top-down'. The second is to suggest that there is a collective, possibly structured and cohesive entity that will be an asset to the DRR and CCA process, once it can be mobilized through participatory activities.

Most organizations that engage in DRR and CCA have considerable knowledge of the power relations that affect the 'community'. However, these often appear to be overlooked when programmes and projects are actually implemented, or they are not considered to be a significant barrier. Those power relations are almost always present (in a wide variety of configurations), especially on grounds of gender, class, ethnicity, caste, patron–client relations or age-group bonding. They are also sometimes justified by culture and religion, making it difficult to intervene from outside.

As most donors support local-level work with the most vulnerable and poorest people, 'community' has become the badge of honour that enables the organizations which receive funds to claim that they are doing the right thing. The World Bank alone has invested or granted US\$ 85 billion in the past ten years to local participatory development activities (Mansuri and Rao, 2013). This provides a financial incentive to perpetuate the culture: it fosters the co-construction of the myth of community by binding together local participants (who may benefit from the activities), local partner NGOs (who want to be lined up for the next project), the international NGO, Red Cross Red Crescent or other organization (who also want the next round of funding) and the donor. This argument may be challenging

Women by the village borehole in Mount Darwin, Zimbabwe. While local-level, participatory humanitarian activities can be of great value, DRR and CCA organizations must learn to think outside of their existing institutional culture to better understand the causes of poverty and vulnerability, and analyse power relations within the 'community'.
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because it could appear that it suggests that much of the work at ‘community’ scale is worthless (see Box 4.1). That is not the argument: local-level work is essential and participation, where it can succeed, is also of great value. What the chapter shows is that it is important to think outside of existing institutional culture to improve work on DRR and community-based activities (CBA), mainly by acknowledging that the causes of poverty and vulnerability must be understood, and that the study of power relations becomes a key part of the analysis.

BOX 4.1 Building confidence in using the idea of community

Where does the concept of ‘community’ fit into local stakeholders’, experts’ or organizations’ ideas of what should be done about disaster risk reduction and climate change adaptation? And does it overlap with the idea as used by organizations that want to carry out DRR and CCA activities? These organizations – NGOs, Red Cross Red Crescent and others – are generally dedicated to supporting vulnerable and poor people in the face of severe risk and climate change. For these organizations, the idea of community is both useful and valid as it reflects what they believe to be the people’s own willingness and ability to collaborate for risk reduction. It also provides a geographical boundary that identifies where funding is used and activities carried out, and a moral guarantee that the organization really is dealing with people at the grass roots. Many DRR and CCA organizations are, therefore, comfortable with the community concept as a way of engaging with people and justify their interventions in ‘community’ rather than other forms of intervention, such as supporting particular households or individuals or working on specific target groups (e.g., school feeding programmes).

However, people at the grass roots do not always share the same priorities as DRR and CCA organizations, and are normally much more concerned by challenges of everyday survival. And a great deal of research and practice has shown that many internal divisions exist within the ‘community’ which make it difficult to assume that it is capable of being cooperative in relation to hazard and climate change risks. The use of the term ‘community’ often seems to assume that internal ‘collectivism’ is sufficient enough to allow an outside organization doing DRR or CCA to be able to handle the divisions. This means that they can overcome the power relations, which are not always easy to see and are often difficult to deal with.

This does not mean that it is impossible for an outside organization to have an effect even when significant divisions and inequalities are apparent. Even if the notion of community is rather romanticized, some organizations may believe that it can help them to support people to move beyond their internal divisions and promote cooperation. Change can happen through support for DRR and CCA because organizations claim to be able to influence people to behave differently. They may have a ‘catalyst’ effect: their presence can change relations between different groups of people to initiate more cooperative behaviour. The very presence of the outside organization can be sufficient for people from different interest groups to alter their attitudes and support DRR or CCA activities.

This may result from the ability of the outside organization to reduce mistrust between people (who may even be from the same economic group) and initiate cooperation that would not be possible without the organization’s presence. For example, some years ago the Nepal Red Cross Society

carried out flood preparedness work in some villages. One of the initiatives was to organize households to put a bag of rice in a building that they knew was never flooded. The idea was to avoid the delay in having to wait for food relief to arrive from outside: each family would have access to their bag if affected by flood. This surprisingly simple initiative was probably very difficult to organize without the catalytic influence of the Red Cross, because of mistrust between the villagers. However, it probably did not challenge any significant power relations in the village. This is a key part of the problem: to understand what interventions may work because they do not present any threat to existing power and which ones might involve significant problems for those who have power and are, therefore, unlikely to work.

Underlying this is the key question that every organization that wants to engage in DRR and CCA must ask themselves: in the 'community' where they intend to work, how much of the poverty and vulnerability is a result of power relations? And from this comes the next key question: how confident is the organization that its proposals for DRR and CCA can succeed given those power relations? So if the intention is to support DRR and CCA at the local level, with the admirable intention of working at the grass roots in the 'community', can that actually have a real impact in the context of the divisions among people in that location?

The most obvious response to this is to find out if some DRR and CCA initiatives can be achieved that do not require any major change or challenge to the power relations. For example, cyclone shelters in Bangladesh (see Box 3.2) can be constructed and the warning system implemented, without much disruption of the existing power relations that are rooted in unequal land tenure and gender. This has led to considerable success in reducing mortality in cyclones, but little if any change in poverty and vulnerability that relates to land tenure and gender relations. The cyclone preparedness system does not deal with causes of vulnerability and poverty, although it reduces some of the specific effects of vulnerability (mortality).

It is, therefore, less a case of a division between those in the intervening agencies who 'believe' in community and those who do not, but rather, given that all are aware of the power relations, what is the degree of confidence in the ability of the organization to:

- overcome local power through its status and own authority
- be aware of the power relations but consider it is possible to work with them for the benefit of the poor and vulnerable, without having to change them
- accept that power is so significant that it is instead better to work on targeted groups or sectors rather than hope that 'community' is a viable category?

Chapter 1 focuses on the need to understand why people are poor and vulnerable in the first place, explains how internal divisions may remain hidden by an all-encompassing but blurry concept of 'community' and highlights the way that power systems operate and can, therefore, reduce confidence in how DRR and CCA can work at community level. Having first analysed why people are poor and vulnerable, how much is it possible to influence this for long-term change through the DRR and CCA activities? Extensive research from all over the world related to power relations is assessed in this chapter. Much of this is from academic sources, and there should be concern that similar critical views do not seem to emerge from the organizations themselves. Are those organizations in danger of exaggerating their impact to please donors and maintain their own funding opportunities? ■

There seem to be two approaches to using the idea of community that are difficult to reconcile. They are based on the amount of confidence of the DRR and CCA organization that power relations can be overcome or sidestepped when working in a 'community'. Institutional culture is built around a conviction that CBA can often be successful and are the right thing to be doing for poor and vulnerable people. Those organizations all carry out local-scale participatory activities, such as Vulnerability and Capacity Assessment (VCA), that are intended to both collect information and engage the local people in the 'ownership' of the activities. However, what is often missing in the process is any questioning of why people are poor and vulnerable in the first place. In much of the world, the DRR and CCA organizations would accept that local systems of power are very significant in explaining who is poor and vulnerable. It follows that there is a contradiction when the more powerful individuals and institutions who are part of the problem are involved, and the 'community-based' DRR and CCA project is trying to make them part of the solution. This is a significant issue because in most projects the powerful are approached either to give 'permission' for the project activities or to become participants and partners.

Why do institutions like to use the idea of 'communities'?

Over the past 40 years or so, there has been a major shift in much development work from 'top-down' policies towards a much greater focus on 'grass-roots' and participatory activities. This change has given rise to a greatly increased role for NGOs (local, national and international) – including those engaged in DRR and CCA – as major agents for development. A parallel change took place in the Red Cross Red Crescent, as shown in the widespread adoption of local activities that use the VCA approach and explicitly support the idea of CBA.

Community is mostly seen as a location or geographical space, often a village or an urban neighbourhood, because this is how the organizations involved give a clearly defined boundary within which goals are set, recipients of aid defined, activities carried out and budget spent. So no matter what definition of community an institution may have (and they can be good and comprehensive), what happens in the end is that projects are carried out within a geographical location (often with specific target groups within it). In effect, the definition of 'community' that organizations end up with is that it is merely 'where we work'. It is probably not a definition that has been done by the people themselves.

There may be some value in using a geographical definition of community: it will inevitably include diverse groups who may or may not have a common interest. Their actions might be entangled on the local level but this may not be evident at higher (e.g., national) scales, so working at the local scale can help to identify local problems and come up with local solutions. It is, however, rare to find any analysis of what

is meant by ‘community’ or ‘community-based’ beyond the geographical idea of the terms: such is the confidence in the benefits and correctness of working at the local scale that the most basic concept being used does not get questioned (Mansuri and Rao, 2013).

Despite this, there is some evidence that community-based action can be effective in DRR (see, for example, IFRC, 2004; Tadele and Manyena, 2009; UNISDR and UNDP, 2007). Local actors may be enabled to make appropriate choices within the context of their environments (Allen, 2006; Jones, Aryal and Collins, 2013). Often, these successes can be attributed to a relatively clear concept of what actually constitutes the ‘community’ (see, for instance, Abarquez and Murshed, 2007). They may also reflect the possibility of successful DRR interventions that reduce vulnerability but do not challenge existing power relations (and that may also be welcomed by the powerful). Groups within the locality will have a stake in risk and disaster reduction measures (Abarquez and Murshed, 2007). It is also at the local level that many of the disaster risks can be addressed before disasters occur (Satterthwaite, 2011). Risk and its manifestations are never abstract but always experienced in a particular place and time. These experiences configure locally specific patterns of exposure, vulnerability, adaptative capacities and solutions, generating what Maskrey (2011) describes as a “social territory of risk”. The example of the Cyclone Preparedness Project in Bangladesh shows how achievements for DRR can be made within the context of existing constraints (see Box 4.2).

BOX 4.2 Bangladesh cyclone shelters

When Tropical Cyclone Bhola hit Bangladesh in 1970, it claimed at least 300,000 lives. Since then, many organizations have been constructing shelters in Bangladesh as a means for cyclone preparedness, including the Bangladesh Red Crescent Society (BDRCS) which has built 147 shelters so far. These are part of the Cyclone Preparedness Programme (CPP), which started as a partnership with government in 1972. The CPP provides an early warning system, with volunteers delivering the warning messages at local level. The aim is to get people to go to a safer place when warned of an approaching cyclone. What makes this complicated is a web of cultural and socio-economic aspects.

One of the biggest challenges for cyclone preparedness is the lack of communal ownership of shelters. The earlier shelters were not built in consultation with communities, and so many people felt strongly that the shelters belonged to others and that those who built them should, therefore, manage them. Many of these shelters became home to development agencies or their projects, further distancing them from community participation.

For several years, the BDRCS tried to develop communal ownership and ensure maintenance through shelter management committees that involved diverse local groups. It was expected that the committee’s ownership would encourage disaster preparedness. However, few of these committees are active today and they are largely dominated by donors of the land used for shelters, who tend to be influential people.

“A pro-community committee ensures public usage of shelters, while others create the perception that shelters are not for everyone,” says Ekram Elahi Chowdhury, BDRCS director of disaster risk management programme and former CPP director. Most of these committees also have no funds for regular shelter maintenance. Committees that do have funds lack guidance about using it. “Often the fund rests in a bank account, to which the community has no access,” says Jamilur Reza Chowdhury. He is a former team leader of the multi-purpose shelter management programme, where shelters may be used as schools during normal times and, therefore, benefit from more regular use and maintenance.

The decision to move to shelters also largely depends on cultural, safety and security issues. Women from conservative backgrounds await their husband’s decision before they move out of the house, while men hesitate to send their wives and daughters to shelters where they are likely to stay in close proximity to other men. “Women also take care of livestock and livelihood assets, which they feel

reluctant to leave and be blamed for losing their only means of income,” says Haurunur Rashid, a former director of CPP. As a result, children and adolescent girls may not be protected since they depend on their mothers to move to shelters. Rashid organized the construction of the first of the BDRCS’ 157 *killah*. These are raised earthen platforms that provide shelter to secure livestock (sometimes adjacent to the cyclone shelters) and can also increase safety for women and girls.



Shelter built by the Bangladesh Red Crescent Society in Cox’s Bazar where BRAC has set up a primary school.
©Himadri Ahsan/BDRCS.

The cultural factors are in many ways connected to design flaws in many shelters. The biggest problem is the

lack of indoor water and sanitation facilities, causing pregnant or menstruating women to shy away from shelters often at the cost of their lives. What encourages vulnerable people, especially women, to go to shelters is their participation in the shelter management committees. In Cox’s Bazar, women like Jareka Begum single-handedly clean the shelter and receive people, naturally attracting more local women to use them. “Involving women, especially in making decisions regarding infrastructural design, is crucial,” says Ekram Chowdhury. Participation of disabled people in the committee is also important to ensure they can access shelters and their special needs are recognized. Crowd control and medical support for pregnant women and those who get injured on their way to the shelter are needs that have remained unaddressed. “In recent times, with stricter enforcement of the national cyclone shelter management policy, the newer shelters are being built with ramps and water and sanitation facilities,” says Abdul Wazed, Director General of the Department of Disaster Management at Bangladesh’s Ministry of Disaster Management and Relief.

The policy also addresses people's concern regarding safety and echoes the statement of Haurunur Rashid: "The shelters need to comply with the building code and be able to withstand wind-speed and earthquakes", which represent a significant risk in Bangladesh. It is also recognized that the shelter's location and proximity are important factors that influence people's willingness to decide to use it; the ultimate aim is that people have to go no further than 1.5 kilometres to reach one.

In addition to cultural and design aspects, the effectiveness of warning messages depends on whether people trust the source of the warnings. "People take warning messages less seriously until evacuation orders are issued by reliable sources," says Khairul Anam Khan, CPP's current director of operations. "And that is where CPP volunteers play a vital role in mobilizing people to go to safer places, because they have earned unmatched acceptance and trust from the communities. In many cases people don't pay attention to messages broadcast by media until CPP volunteers start disseminating the news," adds Ekram Chowdhury.

Rashid and Jamilur Chowdhury agree that more shelters, *killahs* and towers are needed, especially for islands and inhabited sandbanks. But what slips under the radar are factors that reduce access to these shelters. Looking at the overall activities of CPP volunteers, it is culture, safety and security issues of vulnerable people that complicate the volunteers' work. CPP volunteers need to be enabled to address these complex issues of shelter management: otherwise if it is not a safe place, a family would rather risk their lives than stay in a shelter that is hostile to them.

Saidur Rahman, the founding director of CPP, says that national cyclone shelter management policy is remarkably inclusive and enforced, but is still "top-down and missing the aspect of community ownership". This is where CPP volunteers could play a vital role, because their service-delivery design allows the programme to strengthen communities' views by taking part in disaster management at various levels, from community-based shelter management bodies to the nation's top-level shelter management committee.

Rahman gives an example of 12 shelters that were built and registered under the name of the communities they served. This "means ownership was handed over to communities on day one, even before the shelters were built", he says, adding: "All these shelters – not just BDRCS' – should be managed by CPP volunteers, because they represent the communities. CPP was introduced so that warning messages could reach people in remote areas, and the remaining tasks associated with their preparedness should remain with CPP as well." ■

What is wrong with using 'community'?

Critical thinking (and analysis of what community means) is often missing from DRR and CCA practice, and there is little awareness of the intense debates in anthropology and development studies that have been going on for decades. What 'community' or 'community-based' actually means in the context of internal divisions of class, gender, ethnicity and so on is rarely discussed in papers or reports on DRR and CCA activities. It is sometimes emphasized in process, for example in handbooks that include discussion of what community means (e.g., Abarquez and Murshed, 2007; Twigg, 2009). But this is not the same as assessing the effects

of power on outcomes: the actual impacts of power relations on the way the project brings about results.

It is, therefore, important to explore what problems exist with the concept 'community' and reflect critically on what it actually means, and be aware that it may be harmful to DRR and CCA efforts because much about the concept of community is myth.

There are three major (and interrelated) challenges to the concept of community. The first involves criticisms of the idea that communities are a uniform, homogenous entity lacking internal conflicts and divisions (see Cannon, 2008, for a brief introduction). The second, which derives from the first, concerns the specific role of power systems at the local level and focuses on the idea of 'elite capture' (see Dutta, 2009). The third also follows on from the analysis of power at the local level and challenges the validity of participation as a method of engagement with communities. It argues that because of internal divisions and power relations, participation is almost always likely to be distorted in favour of some people or groups and may not enable poor and vulnerable people to be fully represented (see Christens and Speers, 2006, for a review of two key books).

Divisions and conflicts within communities

A number of key conflicts and areas of exploitation and oppression exist within a community. The most significant are related to gender, class, caste, age groups and, in some places, ethnicity. Class is defined in terms of different allocations of wealth and income, and this is often determined by varying access to, and ownership of, productive resources. In rural areas of low- and middle-income countries, wealth, income and asset ownership often relate to systems of land tenure. The 'community' in most cases is a collection of different class groups arranged in a structure of power relations linked to which group has more or less ownership of land. Communities are also 'messy' and are not neatly aligned to fit with the needs and priorities of the external institution that wants to work with the people. Barrios (2014) highlights the difficulties in identifying communities as "clear entities" (see also Etzioni, 1996; Jones, Aryal and Collins, 2013; Goodman, Calderon and Tate, 2014). Twigg (2009) argues that:

"Communities are complex and often not united. There will be differences in wealth, social status and labour activity between people living in the same area and there may be more serious divisions within the community. Individuals can be members of several communities at the same time, linked to each by different factors such as location, occupation, economic status, gender, religion or recreational interests. Communities are dynamic: people may join together for common goals and separate again once these have been achieved. These factors make it difficult to identify clearly the 'community' one is working with."

The first criticism of the idea of community is that it falsely implies unity, collaboration, cooperation and sharing. These notions potentially lead to an idealized view of the way people relate to each other, as Taylor (2001) suggests, its “warm emotional pull”. Blaikie (2006) provides an excellent survey of the problems of using ‘community’ (see also Box 3.5 on Ecuador). Oliver-Smith (2005) argues that, “[C]ommunity does not connote homogeneity and certainly does admit differences within and among communities. More than anything else, community is an outcome, a result of a shared past of varying lengths.” This emphasizes its complexity and the fact that it is not easy to translate into practical work.

Many organizations do acknowledge that the real factors creating poverty and vulnerability are related to power relations. But when projects last only a few years, little can be done to change power and the causes of vulnerability. Overlooking the internal dynamics and differences of communities can lead to distorted research outcomes (Guijt and Shah, 1998). This is demonstrated very clearly in the case of a research project for CBA in some urban ‘communities’ in India (see Box 4.3).

BOX 4.3 Urban class and caste: how a town is not a community

The notion of a community is often artificially imposed by development interventions, including those aiming to reduce risk from disasters. The lack of social cohesion and collaboration is most explicit in urban settings, including towns as well as cities. This box illustrates some of the issues that arose when interventions were made to support urban resilience to climate change in two Indian cities (Gorakhpur and Indore). It describes the problems of using the concept of community as a way of locating projects as part of a major urban climate change resilience initiative. This initiative was designed to operate through the participation and consultation of the ‘community’ that it aimed at benefiting. In Gorakhpur, the project team selected one of 70 municipal wards to deal with the problem of flooding. Like most other projects, this also assumed a degree of cohesiveness within the tightly defined administrative unit. In Indore, four neighbourhoods were selected where the project would help reduce water scarcity. Yet, as the project progressed, it was seen that even within these small units there were numerous ‘fault lines’ that sharply divided the ‘community’.

First, there were economic fault lines within the ward selected in Gorakhpur that led different groups within this one community to perceive risk and resilience very differently. This became evident in the community consultations organized by the project to understand sources of risk and pathways of resilience faced by the ward’s residents. It emerged that it was the behaviour of the wealthier residents of the neighbourhood (who had built boundary walls around their compounds) that was partly responsible for the inundation of the houses of the poorer residents. This was because flood waters would flow past the boundary walls of the richer people into open compounds of the less wealthy. This in turn created obstacles for the resilience initiative that required the creation of consensus among the ‘beneficiary community’. In this ward, boundary walls were clearly the source of resilience for one section of people but worsened the risk and vulnerability for another.

Second, there were social fault lines within the selected community which affected the participation of different groups in the decision-making processes. Volunteers who were helping run the initiative in the municipal ward reported that individuals from the *Harijan basti* (the part of the ward where the lowest castes lived) were, by and large, not included in project processes. While there were a number of reasons for this, the key one was that most volunteers and project staff were from different castes and, as such, were not familiar with this quarter. Some also had biases against this marginalized social group that impeded their interaction with them. For example, one volunteer from a higher caste told the researcher that there was no point talking to these people as they are unable to grasp key concepts being discussed and provide meaningful input. At the same time, project staff noted that securing the participation of those belonging to the Brahmin (the highest) caste had also been difficult. This was because many of them were uneasy about being physically seated at the same level as the rest of the community in project meetings, and did not want to participate as 'equals' with them. This shows how what appears to be a small and fairly well-defined community is actually rife with complex divisions.

Third, as well as issues of class and caste, there were also political fault lines. This was primarily because even as the urban climate change initiative was working to bring benefit to the people of the areas in which it was operating, the elected representatives of these communities had a very antagonistic attitude towards the project. For instance, in Indore, the urban climate change initiative was working to popularize water-harvesting in four neighbourhoods (or 'communities') that were facing water scarcity. Even though this would bring substantial benefit to people in these neighbourhoods, their elected representative had a very negative attitude towards the project. This was because it threatened entrenched systems of patronage he had developed through which he allegedly provided water tankers in the summer for political allegiance and electoral funds in local elections. In Gorakhpur inadequate solid waste management was addressed by project volunteers through new arrangements for collecting and disposing of garbage. This was to protect drains from blockage and to help get rid of storm water to prevent flooding. But this change threatened the existing, malfunctioning system of waste management that was allegedly a source of kickbacks for the local politician. This made him hostile towards the urban climate change initiative, and the attitude of this critically important policy actor at the local level threatened the success of the project. When analysed closely, the seemingly benign unit of the community is clearly the site of coercive relationships, highly unequal power and conflicting agendas. All of these need to be considered when designing and developing interventions to build resilience and disaster risk reduction.

A number of these issues are common to all contexts but a few key characteristics of urban areas require more questioning of the already tenuous concept of community. First, urban areas are expanding rapidly, often because of high rates of in-migration. People come into cities from villages looking for work. Many move back to the villages during the harvest and sowing seasons. This high rate of flux contributes to weak social relationships and a reduced sense of cohesiveness between people even when living next to each other. Second, livelihood patterns in rural areas of low- and middle-income countries such as India are similar and follow the agricultural cycle. This means that villagers are engaged in very similar activities of sowing and harvesting at the same time, with some shared tasks and instances of cooperation. This can lead to a certain degree of shared values and converging aspirations between neighbours (especially those of similar economic and social status).

By contrast, most of the poor in urban areas have informal livelihoods (e.g., as hawkers, rickshaw pullers or masons) or as wage labourers in low-paid jobs in factories, shops, offices and transport. Isolation and lack of common ground, even when people are close neighbours, often result in weak relationships and fragile bonds and little homogeneity. Finally, urban areas are highly dynamic, with constant rapid and significant changes. Poor areas within cities tend to include a significant share of migrants or migrant's children, with little social cohesion. They are also often more mobile (as a result of evictions or threatened evictions from 'illegal' settlements) and exposed to arbitrary land-use policies that seldom take their priorities on board. Informal settlements in many cities in low- and middle-income countries are often demolished to make way for infrastructure projects or speculative investments in other developments. The people can rarely reassemble in the same groupings or recreate their previous neighbour groups. Urban places are also often riven with violence, threats of violence and coercion. Power relations that divide the supposed community are therefore not always even visible or officially acknowledged. ■

The *World Disasters Report 2004*, which focused on community resilience, pointed out that groups that are more homogenous in terms of class, ethnicity, livelihood or wealth are more likely to cooperate in building resilience to disaster than communities divided by those attributes (IFRC, 2004). But such uniformity is rare in most of the world, where conflict, friction, intra-community exploitation and sub-groups are the norm. These internal conflicts go much deeper than people just not getting on together or mistrusting each other. The critical literature on the problem of using 'community' dates back at least to the 1950s in sociology and anthropology (Cannon, 2008; Barrios, 2014). The effects of power relations are often not taken into account, rendering communities "a romantic idea" (De Beer, 2012), and many studies show concern about using the community concept (e.g., Allen, 2006; Cannon, 2008; Dodman and Mitlin, 2013; Yates, 2014; Twigg, 2009; Marsh and Buckle, 2001; Mansuri and Rao, 2004, 2013).

Community and local power systems

The major internal divisions or oppressions found within supposed communities are related to the power systems that organize people by:

- gender
- class (in rural areas this is often linked to land tenure – see Box 4.4)
- caste (not only in India and Nepal; versions of status or racialized caste hierarchies exist in other parts of the world, including Latin America, South-East Asia, parts of Africa and Arab countries)
- slavery and other forms of non-free labour such as debt bondage (which affect tens of millions of people globally)

- ethnicity
- sexuality
- age group.

Slavery is still recorded in many countries including in parts of Africa and Asia (e.g., Okogbule, 2013), and in Europe, too. Debt bondage results from the accumulation of debt to a moneylender. When it can no longer be repaid, the debt can be passed on to the debtor's children who in effect become enslaved to the moneylender. When the concept of community is used, it does not normally deal with these conflicts and power relations properly. This chapter has space to deal with gender, land tenure and elite capture only.

Gender: Within any locality there is immediately a significant division between males and females. Every single 'community' is split on a gender basis. This is rooted in power relationships that many people will justify in relation to culture (including sometimes religion). Gender inequalities are, therefore, not a random set of things that just happen – they are based on structures, expectations and ways of behaving and aspirations that are long-standing and difficult to overcome (Guijt and Shah, 1998). This relates to DRR and CCA in several ways:



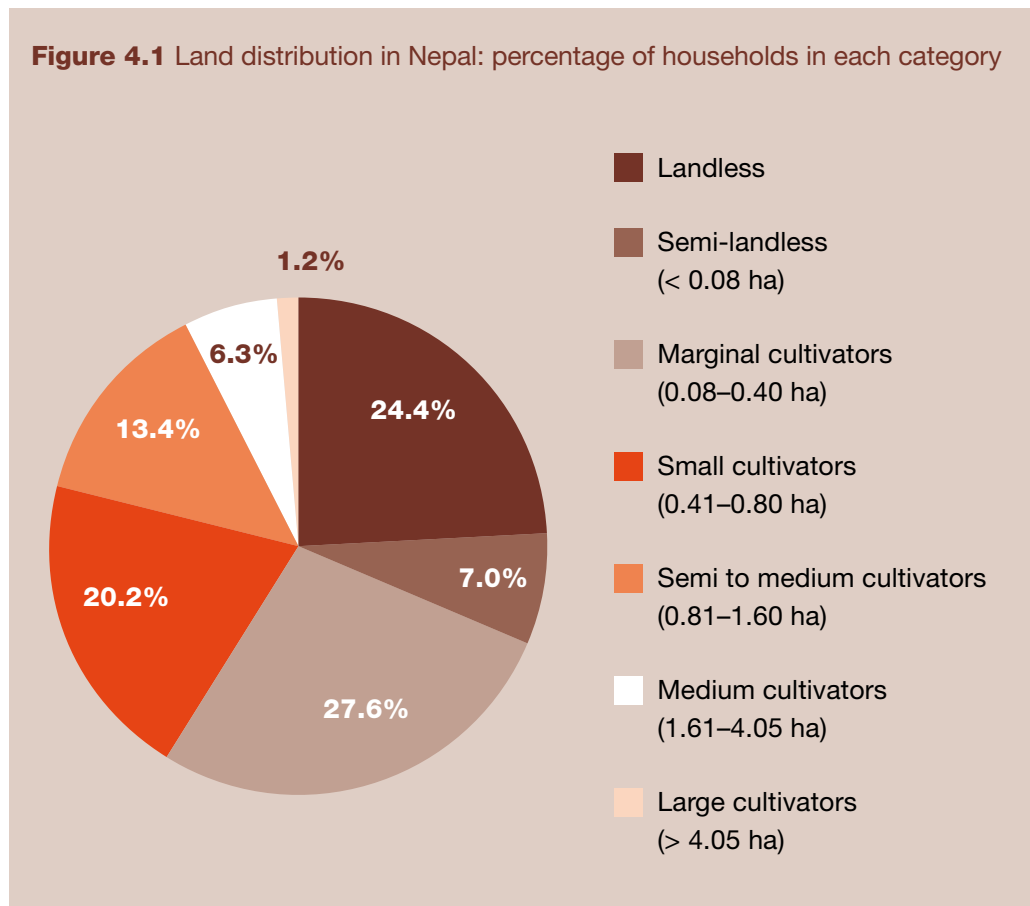
Gender-based social mapping in an ethnically diverse Nepalese mountain village. Only Brahmin and Chhetri women, who belong to the upper Hindu caste, are participating.
© Alexandra Titz

- The situation of females is generally worse in regard to income, nutrition, health and violence. This means that they are generally more vulnerable in relation to many hazards and have more difficulty in recovering (including unfair allocation of relief and healthcare).
- Women generally have fewer rights, especially relating to resource ownership, and a greater work load. This means that they have much less control over how DRR and CCA activities are carried out, so that they may again be disadvantaged.
- Girls and women are likely to be assaulted physically and/or sexually in normal times, and there is significant evidence that violence and abuse increases after a disaster, both within their household and by men from outside the household (especially when women and girls are displaced and living in camps or refuges).
- In VCAs and community risk assessments, women's priorities are almost always different from men's, and tend to give preference to everyday needs, security and water supply (which occupies many women and children in hours of work each day).
- On the other hand, some evidence suggests that women are better at organizing collaborative work for DRR, and can provide leadership and build better trust and stronger social capital for specific goals within the 'community' (Enarson and Chakraborti, 2009).
- However, UNISDR (2011) noted that, for women's role as agents of change, not enough had been done to create institutional incentives to engage grass-roots women's organizations. The prevailing focus on emergency response rather than DRR failed to address systemic challenges of poverty and disaster, positioning women as victims rather than agents of change.

Although gender issues are almost always included in CBA (not least because of donor conditions on funding), these activities do not take full account of the power relations that determine gender inequality in the first place. For instance, it is extremely difficult to discuss violence within households (which is principally male-on-female), although it is common in much of the world, with one-third of females over 15 estimated to have been assaulted by their partner (WHO, 2013).

It is, therefore, optimistic of most DRR and CCA organizations to believe that they can reduce gender inequalities through specific inclusion of women in participatory activities, since the power relations are long-standing and culturally embedded. There may also be cultural resistance to the process, with many men (and some women) resentful of outside interference in their traditional ways of behaving.

Land tenure: One of the most significant aspects of the power systems in localities is land tenure – the ways that land (especially rural land) is owned and controlled by different classes. Unequal ownership and control of land is very significant in many parts of the world, including much of Asia, most of Latin America and some parts of Africa (see Box 4.4). This includes hundreds of millions of rural poor who are even officially regarded as landless (owning no or only tiny plots of land), such as the estimated 30–60 per cent of landless rural people in South Asia. Figure 4.1 provides the example of Nepal, where one-quarter of all households have no land and 58 per cent have less than 0.4 hectares. In Ecuador, the majority of farmland is still found in few hands and 64 per cent of farms have only 6.3 per cent of the total agricultural land (Herrera Garibay et al., 2010). This single key issue of landlessness and land poverty means these huge numbers of people have almost no control at all over their prospects to deal with disaster risk or adapt to climate change. Yet there seems to be an almost complete gap (in research and practice) on what DRR or CCA means for landless people.



Source: UNDP, 2004. Data are from 2001; land holdings converted from acres to hectares.

BOX 4.4 Land tenure

For rural people the world over, land, and access to it, is at the centre of their lives and livelihoods. Land provides soil in which to grow crops, grazing for cattle and even the space and materials needed to build shelter. To be without land is to be economically and socially marginalized.

It is notable then that in many parts of the world land ownership is highly unequal. Indeed in many countries a small number of people own large tracts of rural land while a significant portion owns no land at all. The number of landless people is generally greatest in South and South-East Asia and many parts of Latin America. Landlessness is not such a significant problem in much of Africa, but relations of land tenure still have major implications for the effectiveness of disaster risk reduction. In many parts of the world, it is also generally the case that law and custom prevent women from owning land independently of their marital household. Because of the great significance of land in rural economies, and the extent of severe land inequality in many societies, rural societies can be understood in terms of 'class', based on who owns land and who does not, and the power dynamics which result.

Many organizations work at the local level in community-based DRR or community-based CCA. When carrying out this work, they often imagine 'communities' to be classless (or assume that land tenure need not influence attempts to carry out DRR or CCA). These assumptions are frequently wrong, and it is vital that organizations are aware of how land is accessed in communities, especially when that access is unequal.

The simple implication of unequal land tenure is that people who do not own land rely for their survival on those who do. For most landless and land-poor households this means having to labour on other people's land. The way this is done varies greatly between and within countries, but includes wage labour (often paid daily and at a very low rate), rental agreements or sharecropping, where a form of rent is paid to the owner in the form of a portion of the harvest (often half or more, depending on who supplies the seeds and any other inputs). This process exposes wage earners to the risk of not getting enough days of work to survive. As a result, it is often landless (and very small landholding) individuals that form the core of the rural poor and malnourished. For these individuals, it is frequently necessary to combine farm labour with other work (including seasonal out-migration).

The simple dynamic of land tenure and its associated power relations can affect DRR efforts significantly. Landowners' ability to refuse employment to landless individuals seeking work or to deny rental agreements gives them enormous coercive power. This can take everyday forms, such as settling personal scores by refusing to employ people from a family against whom a grudge is held or excluding individuals as a sanction for not supporting their voice in a local meeting. The result is that landowners are able to exert influence over many project interventions (including for DRR). Importantly, this can include distorting projects so that the benefits accrue to certain individuals and not others, often benefiting the landowners the most (a process known as 'elite capture'). Finally, it is also common for richer, landed households to provide credit to poorer ones, especially following a disaster. This can lead to the poor being effectively tied to the landlord for many years, in a form of debt bondage. It can also lead to the further consolidation of land as small landowners are forced to sell land in order to pay off debts.

Although not all landowners will act in self-interested ways, it needs to be understood that the power dynamics generated by unequal land tenure can have implications for patterns of access to many resources that extend well beyond land (especially access to water). DRR efforts usually focus on either reducing or redistributing risk, either by changing the way land is used or affecting social institutions to manage risk. Since land inequality clearly affects both of these, it should be clear that issues of land inequality, and class, are of central importance to DRR efforts. Attempts to implement community-based DRR must, therefore, be undertaken on the basis of analysing class differences, carefully considering the role of land and associated power relations. While confronting power relations in community-based DRR projects can be very challenging, understanding them will at least offer some understanding of why people are poor and vulnerable in the first place, and may provide insight into how such problems can – or cannot – be resolved through ‘community-based’ activities.

Highly unequal access to land explodes simplistic ideas about community. Land and the power it gives or takes away create diverse patterns of vulnerability and grant certain individuals significant control compared to others. Effective DRR and community-based CCA therefore requires a thorough engagement with issues of land tenure, class and the power relations that result. ■

Elite capture: Elite capture is a problem that emerges from the power relations themselves and has been analysed in many local studies for different parts of the world (e.g., Platteau, 2004; Dasgupta and Beard, 2007; Nelson and Finan, 2009). In their recent review of nearly 500 development projects, Mansuri and Rao (2013) found that in most cases wealthier, more educated and higher social status people tended to be over-represented in participatory activities and dominant in affecting the outcome of projects.

Local power relations (often involving links to higher-level power systems) subvert the intentions of development interventions (see Box 4.5). Those who have power are able to use it (either during the project or after it is finished, or both) to acquire the assets or other benefits of the project activities. This can clearly be relevant to DRR and CCA programmes or any projects that are trying to be community-based. Again, the literature is well known in development studies, but seems to be almost completely missing in DRR and CCA practice. Elite capture can also happen after a disaster, as in the aftermath of the Pakistan floods of 2010. Poor and landless peasant households lost crops and homes, while their absentee landlords were able to claim large sums of compensation from the government for damage. Some of the poor farming families that tried to return to their lands were excluded by the owners, and some landlords even pursued the poor for debts despite their being destitute and displaced (Hasnain, 2011).

BOX 4.5 Microcredit and disasters in Bangladesh: how development programmes can be subverted by power

Microcredit in Bangladesh was originally intended as a mechanism for poverty alleviation. Instead of previous efforts rooted in charity or social justice, microcredit treats the poor as a resource that produces 'returns' on investment. As originally envisioned, that profit was to be earned through the interest paid on loans. But in addition to loan repayments, another form of profit-making has emerged: the redistribution of assets obtained by poor people through microcredit. In discussions with water and flood managers in Bangladesh, this redistribution is well recognized and widespread. One manager describes the common pattern of loan and disaster resulting in increased vulnerability: "The recent cyclone has particularly hurt the small businesses. They have taken out microcredit loans, have started business, and then in one night, everything is gone. They are now beggars." This vulnerability associated with loans is multifaceted. For example, it is not simply with the loss of assets that the poor are harmed, but in their entrapment in the loan system, which requires constant servicing.

"Then comes disaster," continues the manager. "Any disaster, anything that happens unusually, they [the poor] are the people most affected. So the poor are the most vulnerable section of the people because they have very little bargaining capacity, purchasing capacity. They cannot store anything in order to bargain. If I have production and can store the goods then I can negotiate the price. But I cannot do this if I am always in debt."

This process of wealth generation and capture operates across scales, but a common aspect is that the rich, through their relative advantages, are able to control the political and economic system for personal profit. As a flood manager says, "Five per cent of the population has all of the land. There is a huge discrepancy in wealth, and they have all the land. Even when you go to the villages, someone living in Dhaka holds all of the land." This accumulation of land is the basis for a small portion of the population to profit at the expense of the less affluent members of the community.

In such contexts, disasters become the means of 'asset capture'. As another flood manager explains, "Much of the growth thing is that it does not trickle down. So when it doesn't trickle down the people below become more vulnerable when the disasters come. So the growth is not pro-people, it is not pro-disaster, it is pro-elite." Disasters, then, reverse development gains not simply through direct impacts, but through manipulation and capture of development efforts like microcredit. These processes show that the elite are able to use the poor as a resource. Microcredit has successfully increased the amount of assets among poor and vulnerable groups, thereby increasing opportunities to extract those assets when those vulnerable individuals are repeatedly affected by disaster.

Another manager explains: "Disasters are very important in Bangladesh. It should be our top priority. [Interviewer: Really? The top priority?] Yes, floods, cyclones, and river erosion are of most importance. Many people are becoming landless every day and are having to move to the cities for their livelihoods. So this is the major issue."

These individuals heading for the cities, though, will have first lost their land and assets to more affluent community members before they risk the unfamiliar and dangerous move to cities. Further accelerating this process of creation and capture is the well-documented temporary depreciation of assets following

disasters, when groups of desperate individuals are simultaneously forced to liquidate their assets in order to meet basic needs. Overall, because the exploitative relations common to communities are ignored, microcredit and development more generally provide the fuel for continued exploitation and concentration of wealth. ■

The perils of participation

The third type of critique in doing community-based work relates to ‘participation’. Since community-based DRR and CBA almost always involve participatory activities (for example, in VCA and the similar approaches used by most NGOs), it is vital to understand what are their limitations. Mansuri and Rao (2013) distinguish between ‘organic participation’, which originates from the people’s own initiative to be active in some aspect of social change, and ‘induced participation’, which is the normal type that arises when a development (or DRR or CCA) organization wants to implement a project with the local people and participation is induced by the outside organization. Induced participation is rarely successful, but is a compulsory part of the self-justification of the implementing agency and the donor’s conditions.

The validity of participation in development studies was assessed in a book called *Participation: the new tyranny?* (Cooke and Kothari, 2001). It includes the work of David Mosse, author of some of the strongest critical analyses of participatory approaches (Mosse, 2001, 2003, 2004). Mansuri and Rao (2013) summarize part of Mosse’s argument on problems of participation:

- Participatory exercises are often public events that are open ended regarding target groups and programme activities. Thus, such events are inherently political and the resulting project design is often shaped by local power and gender relations.
- Outside agendas are often expressed as local knowledge. Project facilitators shape and direct participatory exercises, and the ‘needs’ of local people are often shaped by perceptions of what the project can deliver.
- Participants may concur in the process of problem definition and planning in order to manipulate the programme to serve their own interests. Although their concurrence can benefit both project staff and local people, it places consensus and action above detailed planning.
- Participatory processes can be used to legitimize a project that has previously established priorities and little real support from the community.

It is clear that problems of participation are linked to both the internal divisions within a ‘community’ and the difficulties that can arise with elite capture. It is

extremely difficult to carry out participatory activities in a ‘community’ or even to be certain that the ‘community’ is genuine. There have been criticisms of some rather romantic ideas about participation since the 1960s (in relation to the United States), in particular the notion of types of participation ranging from non-existent through superficial to more meaningful levels. Arnstein (1969) used a ‘ladder’ of participation to show this range, and argued that “participation without redistribution of power is an empty and frustrating process for the powerless”. Few, Brown and Tompkins (2006) provide an excellent critical survey of participatory approaches in the United Kingdom.

When an organization wants to designate a locality as the place where they will carry out community-based work (e.g., DRR or CBA), it is almost inevitable that they will need to contact (and get the approval of) the local government officials and local ‘leaders’. This means that from the very start the danger exists that ordinary people will perceive the process as being not for them or that it is actually already being linked into local power systems, which they regard as part of their problem. This type of problem is illustrated by the experience of Terry Cannon. When doing field work in south India, he was invited to visit the home village of a Tamil friend. There, he was introduced to the ‘head of the village’. The friend explained that the reason he was the village ‘head’ and was powerful was because he owned the most land. The previous year his field labourers had protested about the low wages he was paying, and he had the two leaders killed. There was no investigation or arrest. An NGO going to this village to do a DRR or CCA project would inevitably have to seek the cooperation of this murderer. What would be the effect on the participation of the local people in disaster project activities? In what circumstances would it be possible for the views of the poor and vulnerable to be heard? Most people who have worked in low- and middle-income countries have similar stories – and much the same would have been heard in Europe a century or more ago.

Therefore, any NGO or other DRR agency arriving from ‘outside’ must be conscious of the fact that their presence may disturb (or worsen) the existing power relations. Including the powerful in the community-based DRR or CCA process (so as not to annoy them), while at the same time insisting on giving a voice to the less powerful, may lead to problems. This may be overcome by an approach that builds community-wide trust and meets the real needs of those at risk (especially if this includes the elite and richer groups). Can specific goals be met – for the benefit of all – without disturbing the existing power relations? Where vulnerability is itself a consequence of power in the ‘community’, it must be questioned how long the achievements can be maintained and whether anything fundamental has been achieved to reduce the underlying causes of vulnerability.

Conclusion

The ability of people to engage in local DRR and CCA is determined largely by access to, control of or ownership of assets that are almost always affected by power relations. These power relations are highly significant at the local ‘community’ scale and therefore any attempt to engage in community-based DRR or CCA is forced to take place within that context. Organizations that want to support such grass-roots work must make clear distinctions between different economic and social groups and how power influences the opportunities to achieve risk reduction and adaptation. The assumption must be – from the very start – that most people are poor and vulnerable mainly because of power relations that affect their access to assets and income. It is, therefore, essential that any attempts at reducing vulnerability and poverty, or of adapting to climate change, take place with the understanding that local power is likely to want to defend its position. Unless the inherent and integral power relations involved in the ‘community’ are actively understood and incorporated into the required process of transformation, then it is highly unlikely that DRR activities and CBA will have any significant impact.

Four scenarios appear to be related to the goals of community-based DRR and CCA:

- The interventions being proposed can take place for the benefit of the poor and vulnerable *without* needing to change existing power relations.
- Powerful people and institutions are incorporated into the DRR and CCA process, and have a common interest in supporting the measures being taken.
- Because they recognize the common dangers of worse disasters and climate change, the powerful realize they need to transfer resources or raise poor people’s income so that vulnerability and poverty are reduced.
- The DRR and CCA interventions challenge the status quo in a way that is unacceptable to the powerful, who may pretend to cooperate while subverting the process or capturing its benefits (during or after the project).

As Keith Ford, a Caribbean DRR specialist, has advised, it is the responsibility of agencies that are engaged in community-based activities to do the necessary studies to get an accurate profile of the actors and groups who are involved. This would then enable the organization to make an assessment of which of these options is likely. Clearly anything that might involve the fourth option should not even be started. But it is also likely that the goals that are possible under the first option are very limited, and will have little connection with reducing the causes of poverty and vulnerability.

Much of the argument of this chapter is summarized into a series of questions that are clustered to guide the way through the problems of defining and using (or not)

FIGURE 4.2 Guiding questions for working at ‘community’ level

Can a ‘community’ be identified that can be worked with?
 Be explicit about how it is identified and on what criteria.
Given that ‘community’ is a complex and dynamic category, is it probably too complicated to work with it in the first place?

Given current circumstances in the project locations, what conditions are needed in order that participation can work and ‘community’ be a legitimate framework for action?

Relevance of power relations

Who are the people you are making first contact with, and why?
 Do powerful people have an effect on your ability to work with the people?

Are you fully confident this is the proper entry point?
 What alternative approaches could be used (such as targeting individuals with particular characteristics, or groups such as a school feeding programme)?
 What is the logic of working through ‘community’?

(How) Do power relations have an effect on the ‘community’ approach?

Are the existing power relations relevant for the goal of the project? Is the existing poverty and vulnerability caused by power relations?
 If yes, in what ways and to what extent?

Viability of the ‘community’ concept



Project goals and outcomes

What are the power systems in the locality, and what resources do they relate to (e.g., control of land, water, other resources, non-material assets)?

Can you identify the types of power groups and individuals that are there (e.g., landowners, politicians, credit providers, lenders, gangs)?
 How possible is it to control the way your intervention operates in relation to local power systems?

When you identify (e.g., using institutional analysis in the VCA) the different types of powerful individuals or institutions that are relevant locally, what do you think their influence will be on what you do?
 How might their behaviour affect your goals?
 How might your goals and behaviour affect theirs?

What does this mean for prospects of reducing poverty and vulnerability?

Given the influence of power relations from outside the location, is it possible to change causes of poverty and vulnerability in the locality?

In what ways will your presence influence the ways people in the locality present themselves as a community?
 Is what appears to be a community really a social entity defined by collective challenges, interests and goals?

How can differences and conflicts within a community be effectively bridged whenever they constitute barriers to vulnerability reduction and disaster relief efforts?

At what scale are the questions to be used? And at what scale are they more or less relevant?

When are these questions relevant, when can they be raised or answered? Before the intervention? During? After? Always?

Can something be achieved to reduce vulnerability without having to change power relations substantially?
 Are there specific activities that do not challenge those who benefit from power and can be carried out with their cooperation or at least without their interference?

Are there likely to be any consequences for poor and vulnerable people that can arise from resentment by other groups who are not ‘beneficiaries’?

How possible is it to control the way your intervention operates in relation to local power systems?

Is the outcome of power influences likely to help, hinder, or both help and hinder the project goals that aim to support poor and vulnerable people?

How will more powerful individuals, groups and institutions support the reduction of poverty and vulnerability?

Source: Terry Cannon, Alexandra Titz and Fred Krüger.

the community concept, and ways to deal with power relations in the design and execution of DRR and CCA work (see Figure 4.2).

Some organizations justify the way they work by saying, “We only work with the poor and vulnerable: we target them so they benefit.” But what happens when the organization leaves? And in any case, can anyone be sure that the benefits are not being captured right under their noses? It is crucial to realize and expect, from the very beginning of dealings with ‘communities’, that some people are marginalized and normally silenced. But it is equally important to note that others are trying to shut them up, and that there are usually very local reasons why people are marginalized in the first place. Local powerful people or institutions are very likely to affect the DRR and CCA activities, and must clearly be understood as being part of the problem. Under what conditions can they be encouraged to become part of the solution?

The projects that are carried out may alter the power relations in the locality, due to the funding available, the patronage that is possible and the way that the project personnel relate to local people, powerful and not powerful, and to the local authorities and institutions. The activity by the DRR and CCA organizations, therefore, constitutes an additional type of power relation within the community. Consequently, it is also essential to analyse how the project and its power relations will overlap and interact with the existing power systems. Moreover, the presence of an organization in a locality will alter people’s behaviour. People may try to optimize their access to the resources and other benefits (for example, prestige, travel, esteem and training) that come with the project. This also means that relations between people and different social groups will be changed – something that the outside organization may find difficult to analyse.

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Culture, risk and the built environment

Over several decades an increasing number of well-intended disaster recovery projects have failed because social and cultural elements were ignored and because external professional personnel involved in recovery efforts were ignorant or failed to consider these elements as within the scope of their primary responsibilities. In different socio-economic environments around the world, post-disaster recovery efforts have sometimes foundered on the cultural issues that arise because the needs and understandings of people were misunderstood or disrespected by well-intentioned aid personnel and Western cultural paternalism.

The principal aim of this chapter is to draw attention to the built environment (the totality of humanly created, modified or constructed spaces and places) as an important arena for disaster risk reduction and to highlight the advantages of integrating indigenous knowledge and vernacular architecture within contemporary urban development and construction techniques.

Five million survivors were left in immediate need of shelter when 1 million homes were damaged or destroyed as Typhoon Haiyan struck the central Philippines in November 2013. All disasters affect the built environment and many, like the earthquake that devastated Port-au-Prince, Haiti, in January 2010, also exacerbate a pre-existing housing crisis. The state of the built environment, particularly poor construction and inadequate maintenance in hazardous locations, is a major contributing factor in determining community risk and is often largely responsible for what makes people vulnerable in many disasters. Dennis Mileti went so far as to somewhat ironically suggest that many disasters were actually ‘designed’ into the nature of the modern built environment (Mileti, 1999). Others, on the other hand, squarely place the blame for this increasing vulnerability on vernacular architecture that uses traditional construction materials and techniques that are perceived as weak, unsafe and outdated.

Both ‘modern’ and ‘traditional’ technology have shortcomings as well as merits depending on context, application and circumstance. Increasingly, however, vernacular architecture is being replaced by structures built with non-traditional materials especially reinforced concrete (RC) and concrete block. In some countries, the result is often a marked deterioration in the structural integrity of buildings, a decline in traditional building skills and a loss of heritage value that exposes a growing population to future disasters.

Floods have long been a risk in the Netherlands, where the concept of protecting individual dwellings has never disappeared, as illustrated by this amphibious house in Maasbommel.
© Anne Loes Nillesen



Port-au-Prince, Haiti.
© Amanda George/
British Red Cross

The world's population is projected to rise to 9.6 billion in 2050 and to have reached 10.9 billion by 2100 (UN, 2013). Already more than half the world's population live in urban areas and that percentage is estimated to rise to 68 per cent (6.3 billion people) by 2050 (Swiss Re, 2013). There has always been a dialectic

between attraction and risk in the determination of human settlement patterns, a trade-off between soil, resources and location on the one hand, and hazards, such as volcanoes, earthquakes and floods, on the other. But the scale of urbanization in the 21st century and the concomitant changes in livelihoods and technologies have affected most people's relationship with previous cultural norms of settlement and construction and now pose a continuous challenge to the provision of safe, sustainable and affordable buildings. A particular feature of this rapidly changing built environment is the fast-growing, sprawling urban conglomerations located mainly in the high-growth markets of East Asia. These often coastal and riverine urban areas like the Pearl River Delta in China are frequently exposed to multiple hazards such as floods, typhoons and tsunamis. Many, too, are also located in seismically active areas, such as Metro Manila in the Philippines. The sheer concentration of lives and assets exposes more people more often to more risk.

BOX 5.1 Safeguarding heritage in the face of disasters

Disasters not only affect people's lives and environment but also the cultural heritage that is significant to them. Local and national communities can be affected seriously by the loss or deterioration of heritage, due to its symbolic and material importance for their identity, as a mirror of the past and the present, and for its socio-economic value. Disasters damage many heritage sites and practices. Major earthquakes devastated the citadel of Bam, Iran in 2003 and disrupted the New Year's ritual among the Qiang people in Sichuan, China in 2008. In 2010, a massive fire ravaged the Kasubi Royal Tombs in Uganda, endangering the associated beliefs, practices and knowledge of local communities.

Human-induced hazards, including nuclear incidents and serious pollution, can also affect heritage negatively. Damage may be intentional in the case of armed conflict and terrorism, as in the destruction of mosques and churches in Kosovo in 1999 and the destruction of the sixth-century Buddha statues in Bamiyan, Afghanistan in 2001. In Mali, after the 2012 coup d'état, armed groups destroyed

16 mausoleums and 4,200 ancient manuscripts in Timbuktu, and also suppressed the local communities' customs and rituals, crafts, songs and dances, thus depriving them of a source of livelihood and expression.

Disasters may further increase the risk of illicit trafficking of movable cultural properties, as they weaken structures that protect cultural heritage, such as museums, law enforcement and local communities. The number and intensity of disasters are expected to rise, partly as a result of climate change. Human-induced disasters also do not seem to be diminishing. It is therefore of the utmost importance to prevent and reduce the negative impacts on heritage and to safeguard it in the post-disaster or post-conflict phase.

Of great significance, if less understood, is the positive role that heritage can play in reducing a disaster's impacts on people's lives, properties and livelihoods. In the event of a disaster, heritage in both its tangible and intangible forms may serve as an important source of resilience for communities to overcome challenges, materially and psychologically. Well-maintained heritage sites, including natural ecosystems, cultural landscapes and historic urban centres, may reduce disaster risks, supported by the traditional knowledge associated with environmental management and building techniques. For example, when earthquakes struck the regions of Kutch, India (2001), Kashmir (2005) and Sichuan (2008), it was observed that modern buildings constructed with reinforced concrete – but where engineering standards had not been strictly applied – experienced pancake collapse, while those constructed using traditional methods were more able to withstand the shock and save lives. Typical *bhunga* dwellings of the Kutch region survived remarkably well while many new constructions collapsed in the 2001 earthquake.

The safeguarding of intangible heritage can be equally beneficial. During the 2004 Indian Ocean tsunami, it was noted that the number of casualties among the Moken, 'sea people' living in Myanmar and Thailand, was quite low compared to other coastal communities. The Moken apparently survived better because of their knowledge and oral traditions associated with their nomadic, seafaring way of life. Thanks to the 'legend of the seven waves', reflecting the ancestral memory of previous tsunamis, they were able to run to higher ground when they saw the seawater starting to recede. Research is revealing an increasing number of examples where heritage and the continuity of traditional practices have made such positive contributions to resilience.

During the post-disaster or post-conflict phase, the rehabilitation of familiar heritage landmarks and the resumption of traditional cultural practices may contribute to the recovery of a community and help vulnerable people recover a sense of dignity and empowerment. Retaining the cultural diversity expressed in material and intangible heritage, finally, is essential to enable stable societies where differences are acknowledged.

Protecting heritage from disasters is, therefore, not a luxury, but a fundamental consideration to be given priority together with other humanitarian concerns, especially when traditional knowledge and sustainable practices that ensured a certain level of protection from the worst effects of natural hazards or human-made disasters are being progressively abandoned.

In recent decades, many international and national institutions have gathered a considerable wealth of experience in reducing disaster risks for cultural and natural heritage. Models and tools have been developed and tested. Guidelines have been prepared and will be published later this year.

Despite this, the reality is that most heritage properties, cultural or natural, still do not have any established policy, plan or process for managing the risks associated with potential disasters. Intangible cultural heritage rarely figures in disaster prevention efforts or post-disaster relief, and national and international mechanisms for combating illicit trafficking are under-resourced. Existing national and local disaster risk reduction strategies and plans, moreover, usually do not take into account the significance of heritage sites and expressions, and do not include heritage expertise in their operations. As a result, a vast number of heritage sites and expressions are virtually defenceless with respect to potential disasters, while communities worldwide are not exploiting the full potential of their heritage for reducing disaster risk.

It is therefore critical to strengthen the preparedness of cultural heritage properties to disasters, through appropriate planning and capacity building, and at the same time integrate consideration for heritage in general disaster risk management strategies and programmes at national and local levels. ■

Adapting the built environment

People adapt the built environment to accommodate the risk of living for many generations in places where they are regularly exposed to hazards. These patterns then become embedded in cultures over time (Moore, 1964). This cultural adaptation, however, is shown to depend on three crucial factors: that the hazard is repetitive; that it is of a nature to allow forewarning; and that it inflicts significant damage to human and material resources (Wenger and Weller, 1973). Most natural hazards reflect these criteria: storms (including hurricanes or typhoons) are seasonal; floods can be modelled; and the recurrence of earthquakes can be statistically estimated. Fire, frequently underreported, is an omnipresent threat, especially in the shanty towns and suburban-wildland interfaces of many of the world's largest cities. World heritage sites, too, are often at risk, like Dukezong in Yunnan, China, a large part of which burned to the ground in January 2014. Alerts are even issued for tsunamis.

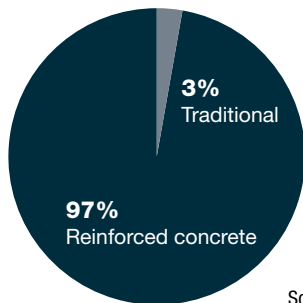
Over the centuries, communities have adapted to risk in the shaping of their environment. Where the hazard was frequent and of a magnitude to regularly cause loss of life and property damage, people in the past developed the pragmatic and theoretical knowledge of learning to live with threat on a day-to-day basis. This accommodation is reflected in the design of buildings and the materials and construction techniques used. Vernacular architecture is often a trade-off between multiple hazards as most communities are exposed to a variety of dangers and have to prioritize risk. As an example, the traditional, stone, low-roofed houses of the Batanes Islands in the Philippines are designed to withstand the ferocious wind speeds of frequent typhoons but are dangerous during the much less frequent earthquakes. No architecture, of course, can be attributed to a single environmental threat. It is always “the consequence of a whole range of socio-cultural factors seen in their broadest terms”

(Rapoport, 1969). The main point here, perhaps, is not so much the original factor or factors that lead to the development of an architectural style, which are likely to be multiple and varied, but why in hazard-prone areas a particular method of design and construction is retained, able to adapt to new circumstances and even accommodate non-traditional materials, often for generations.

If properly maintained, vernacular architecture continues to perform well under extreme conditions. To take the case of earthquakes, the high death tolls in Izmit, Turkey in 1999, Bam, Iran in 2003 and Haiti in 2010 were due more to the failure of contemporary buildings than to vernacular constructions (Doğangün et al., 2006; Audefroy, 2011; Langenbach, 2013; see Figures 3.1 and 3.2). The performance of vernacular architecture on any occasion, however, depends on how well such structures have been maintained. The traditional *taquezal*-infilled, timber-framed houses of Nicaragua largely maintained their structural integrity during the earthquake that shook Managua in 1931 but collapsed in the subsequent 1972 earthquake as timber frames had been allowed to deteriorate badly in the tropical climate (Langenbach, 1989).

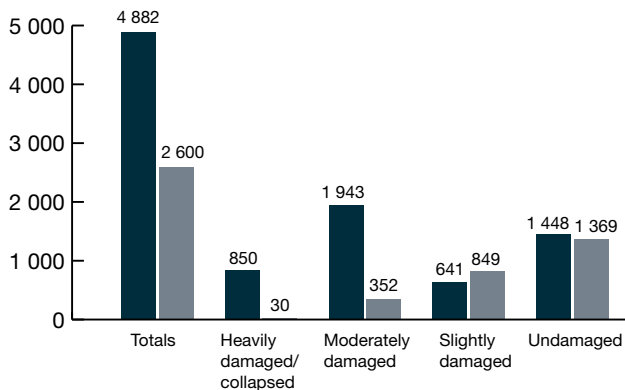
Figure 3.1 Marmara earthquake 1999

Heavily damaged/collapsed houses in Kocaeli and Sakarya (selected) districts



Source: Gülhan and Özyörük Güney, 2000.

Figure 3.2 Marmara earthquake 1999: number of houses damaged by type in Kocaeli and Sakarya (selected) districts



Source: Gülhan and Özyörük Güney, 2000.

Many architectural adaptations persisted well into the 20th century, even in Europe. They continue to influence housing in rural areas of some parts of low- and middle-income countries to the present, although they are fast losing ground to the ‘economics of the cinderblock’. The reason for this rapid decline is due to a combination of factors including population pressure, loss of indigenous knowledge especially among the young, and fashion and status that lead to a marked preference for modern-looking houses that do not incorporate earthquake-resistant features. Another factor is the widespread deforestation of recent decades that has made timber, an integral material in most vernacular architectures, increasingly scarce and unaffordable (Hughes, 2000).

Why culture matters in reconstruction

The focus of government and non-governmental organizations (NGOs) post-disaster is often on building a large number of units with limited resources in the shortest possible time. However, to be successful, reconstruction needs to be linked to sustainable development and include local community input in the design and construction of practical and culturally appropriate houses that also improve resistance to hazards.

At its most abstract, culture is enshrined in the core values that inform the United Nations (UN) *Operational Guidelines on Human Rights Protection in Situations of Natural Disasters*: that owners of destroyed houses should, as far as possible, decide themselves how they are rebuilt (Carver, 2011). Housing is a matter of rebuilding community and restoring social and cultural capital and, frequently, livelihoods. These values are universally recognized if not always implemented and are enshrined in the Guiding Principles of the World Bank’s *Safer Homes, Stronger Communities* (Jha et al., 2010).

The importance of community was, for instance, manifest in the Bam earthquake of 2003, when initially temporary units provided by the government were located in the open desert too far from damaged or destroyed homes and date-palm orchards. More than one-third of these units were left vacant because local people preferred shelters sited either on or near their own properties (Rafieian and Asgary, 2013).

Poor decisions about the site of temporary settlement made under pressure to provide emergency shelter divide communities, disrupt livelihoods and increase vulnerability. An owner-driven approach that involves community input, especially of women and marginalized groups, and that incorporates culturally acceptable building forms and traditional techniques are the foundation for reconstructing communities as well as providing shelter. Unfortunately, embracing people’s preferences can sometimes also impede the reconstruction of more disaster-resistant buildings. In a study of rural Iran, families offered a choice between larger, more modern-looking homes rather than better quality, more earthquake-resistant structures expressed a marked preference for the former (Azimi and Asgary, 2013). Cultural considerations often need to be tempered by the provision of education and technical incentives.

Cultural considerations are not just embedded in decisions about transitional shelter but are also very much integral to long-term reconstruction. Vernacular architecture can provide an important guide for building new houses. For example, more than 150,000 rural units have been successfully rebuilt using traditional construction materials and techniques following the 2005 earthquake in Kashmir (Schacher and Ali, 2009). The salvaging of traditional materials (timber, iron, brick and stone) for reuse and the repair and restoration of vernacular houses wherever practical also preserves architectural heritage and constitutes an important source of community identity as well as aiding psychological recovery.

Early repair, in particular, helps to restore normality, minimizing the disruption of displacement, interrupted livelihoods and consumption of resources for temporary measures. The debate about whether to rebuild or demolish Christchurch Cathedral following the September 2010 earthquake in New Zealand was above all a matter of civic pride and community identity, demonstrating the intangible factors involved in reconstruction (Lee, 2013).

How buildings are built, the nature of the built environment and how buildings are rebuilt in the aftermath of a disaster are as much to do with culture as they are to do with the materials, the design and the means by which they are constructed. The following sections examine these issues in more detail.

Building resilience

Over the past half-century, culture, hazard mitigation and disaster recovery have primarily been associated with the protection and restoration of heritage properties. The conventional wisdom has been that historic buildings are vulnerable and need to be upgraded and protected. Observations of recent disasters, however, question this presumption and people have begun to realize that heritage structures and traditional cultures have a lot to teach today's scientists and planners about resilience and disaster recovery.

'Modern' building culture

Turning to earthquakes, the issues surrounding culture and tradition have often been neglected at great cost to both responders and affected populations. Earthquakes present two very important problems: they are the principal naturally occurring force that buildings are designed to resist (albeit not without structural damage); and they occur without warning. The first of these two problems is not often fully appreciated. Current building codes are predicated on an expectation of damage in a design-level earthquake. Nuclear power plants are an example of highly specialized structures that are constructed to remain within the elastic limit. Many of these building codes are influenced by model building codes that

were first developed in the United States. While this fact is widely known, it is often not fully recognized that North America is a region where, even in urban and suburban areas, a traditional light wood-frame construction remains predominant for new construction. Approximately 90–95 per cent of the population of Canada and the United States live in timber structures and, in general, both in North America and around the world, timber construction has proven to have a low vulnerability to earthquake collapse.

Construction in 2014 of a large four-storey apartment building near San Francisco, California, with three stories in timber construction atop a one-storey RC parking garage.
© Randolph Langenbach



This contrasts sharply with most earthquake-prone regions of the world where the predominant form of construction for all buildings in urban and rural areas is now an RC moment frame (a frame constructed with rigid joints between the beams and columns designed to resist lateral forces) with unreinforced masonry infill construction.

The proliferation of RC frame construction represents a transformation of the building industry around the world over the past half-century. This change has been so accepted and even applauded that its ever more apparent risks are rarely discussed, despite the increasing statistics of earthquake casualties in modern RC structures.

RC construction has become identified as strong and safe in the public mind. In India, it is now mainly what people mean when they express preferences for *puccha* (strong) houses and, in Kathmandu, Nepal, only RC buildings are allowed to exceed two stories. The problem is that the promise of RC has not been realized when it comes to

earthquake safety. With each new major earthquake over the past decades, increasing numbers of fatalities have been found under the pancaked floors of RC frame structures – most notably recently in the 1999 Turkey earthquake (20,000 fatalities) and the 2008 Sichuan, China earthquake (69,000+ fatalities).

A row of collapsed buildings in Golcuk, Turkey, after the 1999 earthquake.
© courtesy of United Nations



What makes criticism of RC moment frames as a system difficult is its proven strength and resilience on occasions. No one can but be impressed when looking across the Banda Aceh, Indonesia, landscape left by the 2004 Indian Ocean tsunami, where only an RC frame mosque still stood amid the otherwise total devastation. By contrast, in New Zealand during the 2011 Christchurch earthquake, a six-storey RC frame structure, the CTV building, killed 119 people when it collapsed, the biggest single loss of life and responsible for all but 35 deaths of 170 fatalities in the central city (Pomonis et al., 2011).



Image of Banda Aceh mosque still standing after the 2004 tsunami.
© US Navy photo by Photographer's Mate 3rd Class Jacob J. Kirk

BOX 5.2 Flood-proof houses in the Netherlands

Situated around the Rhine–Meuse–Scheldt delta and bordering the North Sea, the Netherlands is a mostly flat and low-lying country in the north-western part of Europe. A significant part of its urban and rural areas is situated in polders that are often below sea level and, in many cases, still subsiding. These polders and other low-lying areas risk flooding as a result of storm surges and peak river discharges.

The Netherlands has a long history of flood-risk protection. Many centuries ago, houses were built on top of natural or artificial mounds in order to protect them from flooding. This system gradually evolved into today's ingenious system of dams, dykes and polders that is one of the country's trademarks. Although constructing houses on mounds became largely superfluous as a result of this evolution, the basic concept of protecting individual dwellings never disappeared. Nowadays, different types of flood-proof houses exist. Examples are the pile house, floating house, amphibious house, water-shielding or wet-proof house, and a modern incarnation of the classic 'mound dwelling'.

The pile house derives its name from piles that protrude several metres from ground level and serve as its foundation. The floating house is essentially an extended version of the traditional houseboat. An amphibious house normally rests on a foundation at terrain level and only floats when needed – in case of flooding or high tides. Traditional housing types that are adapted to prevent damage in case of flooding or high tides are called water-shielding or wet-proof houses. In the case of water-shielding, a house is transformed by adding water-shielding façades and window frames; in wet-proof houses, the construction is optimized so as to minimize damage in case of flooding. For example, by including waterproof floors, elevating electricity plugs or by applying vertical zoning rules, there are no vulnerable functions at ground level.

Effectiveness of flood-proof houses

In the Netherlands, embanked and unembanked areas have different flood-risk characteristics.

Flooding of a polder, protected by dykes, will cause the largest amount of damage. As safety levels have risen over the years, due to the gradual reinforcement and extension of dykes, the probability of a polder being flooded has steadily decreased. Flood-proof houses nowadays are considered economically infeasible and, given the level of flood-risk protection offered, are seldom constructed in polders. The consequence, however, is that if a polder is flooded, there is little protection left. Given the tremendous impact of such a flood, the recent debate in the Netherlands concentrates on using flood-proof housing techniques as a second 'safety layer', in order to reduce the consequences of a polder flooding.

Flood plains, coastal areas and other unembanked areas are frequently faced with regular water-level fluctuations. It is in these areas in the Netherlands that flood-proof buildings are economically feasible and a lot of experiments with flood-proof houses are taking place.

The mound dwelling and pile dwelling are fixed in their location. Their effectiveness from a flood-risk perspective is limited to areas where the maximum water level is somewhat predictable, as this type of dwelling is flooded as soon as the water level exceeds the height of the mound or piles. The pile house is, therefore, mainly used in areas with fluctuating but controllable water levels, such as the polders. If such a pile house is built in an area with extreme water-level fluctuations, it generally has very high piles. Building on mounds is still applied in some 'de-polderized' and now unembanked areas. However, this type of housing has little flexibility with regard to the expected increase in water-level extremes that may occur due to climate change.

The water-shielding and wet-proof houses are primarily used in areas with a high risk, or frequency, of flooding, such as historical cities and villages along rivers. These housing types are comparable to the mound and pile houses: given their fixed position, flexibility with regard to the impact of climate change is limited.

The new interest in floating and amphibious houses is due to their flexibility as far as flood levels is concerned, providing robustness with respect to climate change. However, floating houses are limited in the amount of water fluctuation that can be accommodated. Such houses are often anchored at mooring poles; if the water-level exceeds the height of the mooring poles, floating or amphibious houses will drift. In addition, most floating or amphibious houses are not autarkic; a service pipe connection to the quay is commonly used to provide electricity and to serve as water supply and sewer. This connection is flexible and able to accommodate the same fluctuation level as the mooring poles. The mooring poles and pipes can be easily adjusted.

Amphibious houses are not only suitable for riverbed areas with fluctuating water levels, but also for areas that are used for water retention. These retention areas are polders that are designated to be inundated under specific conditions, to decrease the water levels of rivers or to accommodate extreme rain water levels.

Flood-proof strategies

A global tradition of using flood-proof housing techniques exists. Often, these housing types become obsolete and disappear when large-scale flood-risk structures are developed. Flood-proof buildings, however, have many advantages and are a very robust and adaptable form of flood-risk protection. There is, therefore, a renewed emphasis on the potential of flood-proof houses among designers and policy-makers. Flood-proof buildings have the quality and potential to become an important and integral part of flood-risk protection strategies. ■

Vernacular architecture

At the opposite end of the socio-economic spectrum is Haiti, which was struck by an earthquake in 2010 that devastated the capital city of Port-au-Prince. This earthquake revealed the urgent need to address the risks attendant with RC moment frame construction as a building type. In particular, it was the perceived failure of notable RC buildings (two luxury hotels, one the UN headquarters, the historic cathedral and the National Palace), that gave rise to the initial impression that the death toll in the dense hillside informal settlements largely built of concrete block must be catastrophic. In fact, a substantially greater percentage of self-built slum housing remained standing than did the more formal, contractor-built and sometimes even engineered buildings of recent RC construction (Langenbach, 2014). Similarly, many of the 19th century ‘gingerbread’ houses near central Port-au-Prince constructed with walls of a mixture of brick and rubble stone also remained standing (Langenbach et al., 2010).



Non-engineered concrete block and slab houses in Jalousie informal settlement, Petionville, many of which survived the 2010 earthquake. © Randolph Langenbach



The Villa Castel Fleuri, which was constructed with walls of brick and rubble stone, was still standing after the 2010 Haiti earthquake. © Randolph Langenbach

A critically important lesson can be learned from findings about these century-old rubble stone construction and self-built slum houses that remained standing: the best insurance against collapse in earthquakes may simply be that buildings need walls, whether they are of traditional masonry, cement block or poured concrete. It is a case of simple arithmetic – a wall is simply larger than is the rigid connection between the columns and beams in a moment-resisting RC frame. If the RC frame is top quality, its performance can be extraordinary, but this standard can only be expected in a small percentage of buildings now that such construction has become so common and is undertaken in environments where quality assurance in materials, workmanship and oversight is inadequate.



'Gingerbread' house in Port-au-Prince.
© Randolph Langenbach



New *dhajji* construction in Thub, Pakistan.
© Maggie Stephenson/UN-Habitat

Another form of traditional construction in Haiti that did better than the masonry bearing wall construction was the half-timber (*colombage*) or timber frame infilled with a single layer of masonry. This kind of construction existed in Ancient Rome, as evidenced by the excavation of the ruins of Herculaneum. It has demonstrated its seismic resistance in a number of large earthquakes over the last two decades, including 1999 in Turkey, 2001 in Gujarat, India, and 2005 in Kashmir. Historically, versions of this form of construction were developed specifically for their aseismic qualities in Lisbon, Portugal after the 1755 earthquake and in southern Italy after the 1783 Calabria earthquake.

Today, interest in many different forms of vernacular construction is growing and, in earthquake areas, has increasingly focused on traditional construction typologies that have demonstrated a greater than expected resistance to collapse when compared with modern RC frame structures. The most impressive example of the increased acceptance of traditional construction for earthquake hazard mitigation to date is in Pakistan. There, a year after the 2005 Kashmir earthquake, the government of Pakistan approved *dhajji dewari* (half-timber) construction as compliant with government rural housing construction standards and eligible for government financial subsidy. A year later, they also approved *bhatar*, a timber-laced

bearing wall masonry construction. By 2009, at least 150,000 new homes had been constructed using one of these two traditional typologies in this region of northern Pakistan (Langenbach, 2009).

From a hazard mitigation perspective, readoption of these traditional local technologies represents a potentially sustainable approach to housing construction in many low-income countries as an alternative to the now ubiquitous use of RC frames. While it cannot entirely displace the continued building of RC frame structures, it provides the basis for establishing a better balance so that every building need not be just in concrete. The embrace of only concrete as 'modern' often has been destructive of architectural and itinerant craft traditions in many parts of the world. Restoration of the kind of crafts needed for the reemergence of local vernacular architecture can also help preserve other aspects of community culture.

Retrofitting reinforced concrete buildings

The question remains as to how to deal with the problem of now proven risk presented by the many existing RC moment frame buildings. Of the 37 countries represented to date in the United States National Science Foundation-funded World Housing Encyclopedia, 23 have submitted reports on seismically vulnerable RC structure with masonry infill construction. They have also produced a useful open-access, 70-page tutorial on the correct design and construction of buildings with RC frames with infill (Murty et al., 2006). While this document aims at improving future construction and discouraging the untrained and unregulated use of this technology, its observations touch on the scale and severity of the risk of existing buildings worldwide that are vulnerable to sudden collapse. For example, when the World Bank did a study of the potential collapse hazards in Istanbul after the 1999 earthquake, it determined that funds were simply insufficient to correct the problem and turned its attention to schools, hospitals and other critical buildings (Yanev, undated).



A multi-storey RC frame apartment house in Golcuk, Turkey partially collapsed by the 1999 earthquake. The lack of adequate moment connections and very thin columns is evident.
© Randolph Langenbach



A ten-storey RC frame with infill structure in Istanbul with an extremely weak and vulnerable ground floor.
© Randolph Langenbach

New construction in Turkey increasingly includes RC shear walls, which are designed to resist shear, the lateral force that causes most damage in earthquakes. This promises a substantial reduction in the risk of collapse. Confined masonry is a viable alternative. However, retrofitting the vast numbers of existing moment frame buildings with shear walls is very costly and involves the removal of the occupants for extended periods. Other, less disruptive but effective methods are beginning to be proposed for these types of buildings to address and correct the systematic exclusion of the infill masonry walls from the conventional engineering analysis and calculations used for such buildings. It is increasingly clear that if seismic retrofit

of these structures known to be vulnerable is not undertaken, it will take at least a century for the normal cycle of building demolition and replacement to reduce the hazard that now exists.

After the 1999 earthquakes in Turkey, people in Istanbul started carrying whistles in their pockets, so they could be heard if caught between the pancaked slabs of their own homes. Unfortunately, they still need them.

Post-disaster reconstruction

The impact of a crisis is not only death, injuries and physical damage to property but may also involve a perception of the failure of and loss of confidence in local systems, local building culture, local organizational structures and traditional values (Oliver, 2006). The aim of post-crisis assistance is to enable affected populations to recover rapidly their pre-crisis status. In some instances, this aim is extended to 'build back better' including risk reduction at the level of settlements or safer building construction.

Determining appropriate shelter solutions

The disaggregation of shelter recovery into distinct phases and activities described as relief, transition, rehabilitation and reconstruction does not reflect the experience of many households for whom (re)making a home is more of a continuum. For some, reconstruction starts the day after a disaster; for others, many steps may be involved to get to a durable housing solution, including temporary shelter, staying with relatives, mobilizing resources and construction over several years. The challenge for shelter assistance actors is to acknowledge the complexity of shelter recovery and to ensure shelter support (financial and technical) optimizes local capacities and adds value strategically to enhance those capacities for the future.

During the relief phase, the emphasis by external assistance agencies on needs rather than capacities, the description of affected communities as 'victims' and the importation of standardized solutions can be counter-productive to the dynamics of local recovery. Likewise the control of resources and assumption of responsibility and authority by external relief actors on issues such as shelter and housing recovery can inhibit the initiative of local households, local leaders and local institutions to propose and implement solutions in their own way. This is particularly critical in areas of frequent disasters, such as cyclones and floods, if the population is to attain a degree of resilience and avoid repeated losses and dependence on external assistance.

Optimizing local capacities may involve technical experts using their wider access to information to share appropriate technological know-how to address shortcomings or achieve improvements in local building practices. These weaknesses may

be inherent to the technology, to loss of traditional knowledge and skills or to the poor execution of modern technology. Each case requires different technical support strategies. For example, the IFRC's Sahel shelter project responded to the need for more culturally and environmentally appropriate shelter solutions for populations displaced by disaster and/or crisis in West Africa following concern about the poor performance and cost of imported tents and shelters. After flooding in Burkina Faso (in 2008, 2009, 2012 and 2013) and regional conflict, drought and food security issues in the Sahel from 2011 to 2014, the project replicated the familiar rectangular form with a domed roof based on traditional Tuareg semi-nomad shelters but achieved greater structural stability and reduced timber requirements. The specification of local mats ensured local procurement and sewing skills were used and the project development benefited from traditional knowledge of details for rapid assembly and dismantling, important in a nomadic culture (IFRC, 2012).

Unfortunately, the exigencies of shelter programming often tend to exclude such approaches. If time is a key constraint to using local solutions in emergency shelter, it might be expected to be less so in rehabilitation and reconstruction activities. In practice, however, bias about saving time continues in reconstruction projects where advocates for prefabrication, industrialized techniques and contractor construction promote their apparent advantages and efficiencies including time.

The danger of losing traditional skills

Building cultures are always in a process of development and evolution. In particular, the shift from rural to urban culture has been a change from agriculture and subsistence to a largely cash-based system. Rural cultures are also in transition, usually less dramatically, but often with significant losses of traditional skills, sometimes due to the arrival of modern materials.

Disasters occur within this context of transition and may accelerate aspects such as urbanization, adoption of new materials and change from joint to nuclear family households. A major crisis may also precipitate conscious and deliberate change, for example, local masons devising solutions to address weaknesses in buildings, institutions or authorities introducing policies or regulatory measures to drive changes in practices, or assistance actors promoting change through training or subsidies.



Girl organizing shelter in Kashmir, 2005.
© Maggie Stephenson/
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There is a risk in this accelerated period of change that valuable assets, knowledge and skills are lost, including through the demolition of traditional buildings rather than their rehabilitation. Local building culture may be further undermined through exclusion from the menu of choices for reconstruction and from standards and technical guidance.

The time following a disaster is critical in the definition and redefinition of building cultures. It is a period of exceptional focus on construction issues and decisions, a process that can either validate, promote or improve local and traditional skills, or reject them as invalid and replace them by alternatives.

BOX 5.3 Women: a crucial role in housing recovery

Women carry the largest burden of an inadequate home. The bond between women and their built environment is particularly important for women from cultures where the home remains the primary site of their social and cultural practices, largely because they spend most of their time in and around the home. Moreover, as women are often the primary caregivers to children and other vulnerable people, their ability to manage their household is paramount to the entire family unit. Women and the people they care for benefit disproportionately from decent housing and settlement planning.

Shelter agencies operating in post-disaster situations find it much easier to identify local needs than to identify and unleash the potential of local assets. This is a general problem but is particularly true for women. The IFRC recognizes that the potential of women to play an active, rather than a passive, help-recipient role should receive particular attention. The organization says: “In a disaster, women in general may be affected differently from men because of their social status, family responsibilities or reproductive role, but they are not necessarily vulnerable. They are also resourceful and resilient in a crisis and play a crucial role in recovery” (IFRC, undated). So how can shelter agencies ensure that women play this positive role and contribute fully to the process of housing recovery that means so much to them?

Women and housing

Disasters come with loss of homes, homes that denoted and carried the family structure and its practical, social, economic, religious and cultural relations to the larger community. As a representative of SNEHA, a local NGO active in reconstruction after the 2004 Indian Ocean tsunami, stated, “We are not building houses, but it is a way of life that needs to be restored.”

In many cultures, women are given full command of their households and ample autonomy to manage them. They can act as the primary homemakers providing for the household, cook, bring up children and perhaps also manage livelihoods activities from the house. Women are also involved in many ways in building, as labourers during construction and as supervisors. They might be responsible for preparing their houses for harsh weather and for beautifying their homes as an expression of individual and collective cultural identification.

In times of upheaval, women have proven to be crucial partners to humanitarian agencies during the housing recovery process. Their role can span the entire housing process, from planning and home-making to construction depending on their culture and context.

In the case, for example, of planning displacement camps, especially if cooking and bathing are organized through institutional arrangements, assuring privacy and security can be addressed in a culturally appropriate way through planning together with the women. But as Swarna Rajagopalan from an Indian-based feminist thinktank reflects, “Agencies tend to see the inclusion of women through their gender framework, and miss the women’s own efforts for change. All relations within a community are trade-offs between power structures on the one hand and kinship, security, etc. on the other. It is important to reflect on whose vision of a women’s inclusion are we promoting?”

Rehousing propels a change in cultural practices and people find themselves living in dwellings that have little, if any, relation to their original houses. If women’s roles include safeguarding traditions, the home can become the place of resistance to guarantee their values and rebuild their community identity. During times of crisis, cultural practices related to homemaking, such as cooking according to their own traditions, often become treasured mainstays for the affected people. Women frequently become key players in ensuring that their cultural practices do not dissipate with the pressures of adjustment.



Mother and children prepare dinner in a makeshift shelter in Kashmir.
© Robbie Reynolds/GOAL

Housing recovery: an active role for women

As the culture of ‘not being able to talk it’ remains rife, agencies try to ensure that women are included as members of staff in humanitarian organizations and represented in community-level meetings, as well as during policy elaborations. Women immersed in the local community are preferred (e.g., rural women if rural knowledge is required). It is sometimes useful to avoid bringing everyone together to make joint decisions; instead planning sessions are broken down into focus groups and committees with women-only participants to better discuss women’s specific needs. Other measures include anonymous lines of communication and placing gender protection advisers at shelter clusters. There are boundaries to talking in public about what are considered private activities such as bathroom habits. Women’s specific needs are still a taboo in community planning sessions, even in agency and inter-agency meetings among ‘professionals’. Some women may not talk to men outside their family or community about private issues without the consent of community leaders or husbands.

Disasters tend to shift the housing process from a feminine or domestic realm to a masculine or public realm. In many communities women are not the official household representatives, resulting in their underrepresentation in decision-making structures. Furthermore, women and their organizations might find it difficult to

get heard, as they are usually less assertive and networked. Similarly, women are given less influence in financial decisions in communities where they are less likely to have a regular income. Agencies counter this, for example, by giving women specific responsibilities within community organizations.

Laws may discriminate against women. In some societies women are given few rights in terms of ownership of land and property, making it difficult for their voices to be heard. Elsewhere, properties are registered in the name of a woman in the family, a custom derived from a more protective attitude towards women. Disasters are often seen by agencies as an opportunity to redress differential gender practices and, for example, they try to ensure women are signatories on any documents and introduce joint ownership of property. Housing microfinance often provides an opportunity for women to have more input into the development of their homes.

In short, the female role of homemaker is put under great pressure in post-crisis situations because so much depends on it. This heightens the need for cultural sensitivity and understanding from agencies. Unless it is deliberately identified, the challenges of the homemaker role may simply go unnoticed. Shelter agencies will also typically be more focused on the familiar challenges of giving women a public role. As measures are taken by agencies to ensure that women play this crucial role in recovery through gender-sensitive programming, challenges remain for shelter agencies. What is particularly taxing for agencies is to ensure women play that crucial role devised by their particular culture and context when there is no stereotypical cultural model or women's role on which to base procedures. ■

The role of assistance agencies

Assistance agencies and technical professionals involved post-disaster are key participants in the process of deliberation about building cultures and choices. Their activities include technical research; the review or development of standards, training and public awareness; support for owner-driven shelter and housing rehabilitation, retrofitting and construction; and settlement protection and mitigation works. The majority of these actors may have no previous knowledge of the local area or building culture, and their introduction post-disaster is at a time when local systems are weakened.

External 'experts' generally arrive in the role as pathologists, to right the wrongs of inadequate and inferior technology. They assume superior expertise and solutions rather than recognizing there is as much to learn as to impart. While many experts quantify losses, few investigate damaged buildings qualitatively to understand the causes of poor performance in consultation with local building professionals. Fewer still document the local buildings that performed successfully.

There are exceptions, however, when agencies have successfully identified, promoted and regenerated local knowledge. One example is the use of *quincha*, a traditional system of lightweight cane panels, for both shelter and permanent construction post-earthquake in Peru by Practical Action. Another is the integration of traditional typhoon-resistance principles of framing and tying down roofs promoted in new and hybrid construction techniques by Development Workshop in Viet Nam. In both

cases, local knowledge was valued and replicated but also interpreted in accordance with the evolving economic context. These two examples also illustrate key factors in the valorization and regeneration of local building cultures: the importance of an iterative development process in close partnership with local communities particularly with local master artisans.

The greater proportion of post-disaster shelter and housing reconstruction is built by the affected population with their own resources, and their continued construction and settlement decisions determine their future vulnerability or resilience. Longer-term benefit can be achieved if external technical and financial resources add value to existing local building processes, including facilitating the regeneration of local knowledge and skills, developing appropriate improvements.

Imparting local building practice

Coordination and policy development support should ensure access to the wealth of knowledge held by key resource people and institutions, promoting the voice of local artisans and the advice of national experts for external cross reference. The continuation of research and development work before and after a crisis ensures a greater understanding of the normal construction context, expands knowledge of the engineering performance of local technologies through empirical testing and analysis, and establishes greater awareness among technicians and decision-makers of the potential of vernacular construction. Continuous research and advocacy, for example, by the Catholic University of Peru and others on adobe construction has sensitized a generation of engineering students about earth construction nationally, regionally and worldwide (Hardy et al., 2006). Likewise, research into the conservation of historic stone structures in Italy has provided valuable knowledge for the rehabilitation of traditional housing elsewhere (World Housing Encyclopedia, undated).



However, educating local masons, carpenters and households requires creative engagement with and understanding of local culture. Simplification and illustration of conventional engineering language, for example, into posters is a common approach but may not acknowledge that local units of measurement (for example, in Swahili-speaking areas of Africa, measurements are based on the span of a hand) do not follow engineering conventions (Oliver, 2006). In some building cultures, specialization is fundamental to the preservation of tradition, with formalized terminology and rules; skills are learned and traditional practices sustained through

Traditional carpenter:
learning through
inter-generational
transfer.
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the repeated copying of agreed models. Models establish not only construction principles but also associated form and design principles which comprise the architectural vocabulary which may endure even as construction technologies change.

The demonstration or model pattern of transmission may be one of the most effective post-disaster. Full-scale construction of test or demonstration buildings is easy to understand, enables inclusive experimentation including modifications with real materials, is accessible for feedback and generates information on time, cost and other aspects which are critical for decision-making by both masons and households. Demonstration buildings can revitalize and valorize local skills when master artisans construct to model standards afforded by supportive sponsors. Participating engineers and architects should be encouraged to learn from the artisans about topics not covered by formal engineering education. The central role of master artisans in this process reinforces their cultural position as reference and best practice. However, master artisans may not be willing to lose their specialist status by sharing knowledge or may not have good communication and mentoring skills, issues which need to be taken into account as part of the cultural context.

BOX 5.4 Tackling corruption

For many years disaster officials have commented on the problems of corruption, such as disaster assistance that is diverted into large pockets or the construction of shoddy, unsafe buildings due to building inspectors being bribed to approve the construction of reinforced concrete beams with missing steel reinforcing bars. However, over recent years, hearsay, gossip and suspicion are being replaced with potent evidence of a ‘culture’ of corrupt practice with governments and their political leaders and public officials openly being identified.

Transparency International (TI), the German-based NGO, has performed an outstanding service to the global humanitarian community through their investigations and their courageous naming and shaming of those held responsible (Maxwell et al., 2008; TI, 2013). For example, they revealed a massive US\$ 500 million shortfall of unaccounted money in the US\$ 1.2 billion received as aid by Sri Lanka after the 2004 Indian Ocean tsunami for which the government has never provided any adequate explanation (TI, 2007a; 2007b).

A probing analysis of corruption in Sri Lanka conducted by the Humanitarian Policy Group in 2008 concluded that: “...the vast amount of humanitarian assistance that entered Sri Lanka after the tsunami exacerbated corruption risks...[and] that many politicians at the national, provincial and local levels and other non-state actors used the large influx of resources as an opportunity to increase their political capital amongst their constituencies and for personal enrichment” (Elhawary and Aheeyar, 2008).

Corruption also blights disaster risk reduction in certain countries. Transparency International has stated that 60 to 70 per cent of the £640 million spent by the Pakistan government’s Federal Flooding Commission since 1977 has been embezzled. The consequence of this theft, resulting in the failure

to construct vital flood defences, can be partly held responsible for the loss of the 1,600 people who perished in the Pakistan flooding of 2010 (Hunt, 2010).

In 1976, a world authority on engineering seismology, Professor N.N. Ambraseys, began his talk at a Royal Society conference in London on the Guatemala earthquake, where 22,000 people died due to collapsed buildings, with the cryptic statement: "Today's 'Act of God' will be regarded as tomorrow's 'Act of Criminal Negligence'." It took a further 35 years for him, working with another eminent seismologist, Roger Bilham, to substantiate his prophecy and provide conclusive evidence of corruption as a major cause of earthquake deaths and damage: "Of all earthquake fatalities attributable to building collapse in the past three decades, 82.6 per cent occur in societies that are anomalously corrupt." Their explosive conclusion came from an examination of earthquake fatalities in building failures within countries that are assessed as corrupt by Transparency International (Ambraseys and Bilham, 2011; TI, 2013.)

Corruption is particularly rife in reinforced concrete dwellings. Damage assessments conducted in China, Haiti, Pakistan and Turkey reveal that reinforcing steel is regularly omitted from concrete beams and columns, and that cheap sea sand containing corrosive salt is substituted for more expensive quarried sand (Krimgold, 2011).

The United Nations Office for Disaster Risk Reduction (UNISDR) produced a book of advice to journalists covering risk reduction issues and addressed the corruption issue by raising the critical concern that only independent and regular inspection can ensure the integrity of building construction. They noted that: "... the main perpetrators may not be site workers. Pressure for omissions, to cut costs or to save time, may be applied by managers as a consequence of backhanders to obtain the work and to secure the contract, an increase of overheads only redressed by cutting costs and reducing quality in the process" (Leoni, undated).

Actions to prevent corruption

An ambitious series of linked approaches are needed from varied sources and sectors of society to prevent corruption (Davis, 2014):

Education

- Ethical education from primary schools onwards in schools, mosques, temples and churches
- Ethics to be part of the higher education curriculum for building and infrastructure professions
- Ethics to be built into staff training and ongoing professional development
- Training opportunities of enforcement officials by the NGO sector to be expanded.

Professional standards

- Professional codes of practice for engineers and architects established – perhaps using the examples of ethical medical codes
- Governments setting an example of exemplary practice in all their dealings, contracts, buildings, etc.

Adopting anti-corruption practice and procedures

- Tendering procedures for contracts
- Developing building and planning code supervision as a key requirement of governance
- Paying enforcement officials good living wages so that they do not need bribes as income supplements
- Ensuring strong legal support, with sanctions imposed for failures
- Avoiding large contracts where possible, since corruption is minimized when contracts are kept small with tight community financial control and surveillance

- Avoiding ‘middlemen’ in the allocation of funds: direct cash grants to affected people in disaster reconstruction projects have been found to reduce corrupt interception of grants or loans
- Building specific anti-corruption measures into guidelines: the World Bank’s *Safer Homes, Stronger Communities* handbook provides an excellent example (Jha, 2010).

Public awareness to promote advocacy to avoid corruption

- Recognition of the vital role of an informed media, to draw attention to corrupt practice.

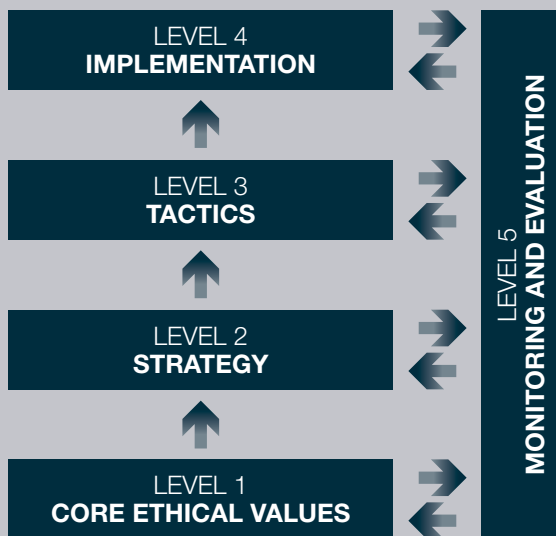
Official pressure from international organizations

- Key agencies responsible for risk reduction and adaptation to climate change (UNISDR, United Nations Development Programme, IFRC, World Bank, etc.) need to boldly build this issue into their agendas and put pressure on countries with serious corruption problems to comply with internationally recognized building practices and standards.

Summary

Given the scale of the entrenched problem of corruption being a major ‘risk-driver’, valid solutions need to be as wide-ranging, on the lines of the approaches above. Concern followed by actions cannot be confined to government leaders and public officials but needs to extend far deeper into civil society and involve key professions, religious leaders, trade unions, teachers, the media, etc. A concerted commitment is needed from all stakeholders to insist that every project needs to start from an ethical base of core values (honesty and integrity, transparency, accountability, equity, protection of the vulnerable and maintaining professional codes and standards) and not merely from a planning strategy and tactics (see Figure 1). A further ethical concern includes independent supervision of building siting, design and construction to ensure that safety factors are assured and maintained.

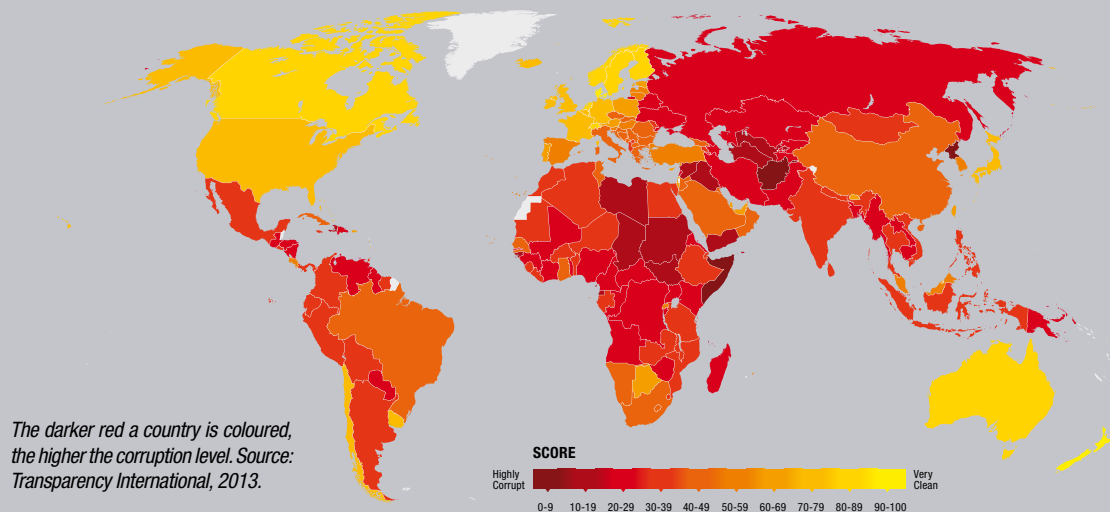
FIGURE 1 Project planning and implementation model



Source: Alexander and Davis, forthcoming.

Just over 200 countries were signatories to the 2005 Hyogo Framework for Action to indicate their commitment to the high ethical ideal of disaster risk reduction. Yet 69 per cent of the 177 countries listed in the 2013 Transparency International Corruption Index (see Figure 2) 'indicate serious corruption problems'. The regional picture is particularly alarming with 95 per cent of countries in Eastern and Central Asia, and 90 per cent of countries in sub-Saharan Africa perceived as having serious corruption problems (TI, 2013). It is now essential to undertake correlation studies of disaster casualties and damage with national corruption levels.

FIGURE 2 Transparency International corruption index 2013



Despite mounting evidence of widespread corruption in building practices, this deadly 'risk-driver' still awaits the serious attention of international agencies on account of its political sensitivities (Alexander and Davis, 2012).

Corruption needs to be rescued from the obscure sidelines of polite discourse concerning disaster risk reduction and placed centre-stage as a principal concern. It has to be accurately described as a form of criminality that demands urgent international and national action by all who seek to reduce risks. ■

Conclusion: Sustaining cultures

The sustainability of local building cultures including their continued practice after a disaster is closely linked to the sustainability of natural resources used in their construction, including extracted materials like stone and earth, and renewable materials like timber, bamboo and the like. However, increasing pressure on resources has made their continued use in construction controversial, a debate heightened by blaming environmental degradation as a contributing factor in disaster losses. In fact, a disaster may galvanize political and social will to take action to improve environmental management. Where this is a feasible proposal, it may be a key initiative for the assistance community to support. For example, investing in settlement-level mitigation may be more technically and cost effective than focusing on individual household mitigation as, for example, in the case of flood protection.

Critics of traditional construction on environmental grounds tend to miss a number of related issues such as the environmental impact and often poor climatic performance of alternative modern and imported materials, the relative energy efficiencies of modern versus traditional housing, and the potential to increase the lifespan of buildings through improved construction methods, repair and rehabilitation.

Local populations do not make decisions regarding their homes and settlements based on a single criterion. They are balancing social, economic, physical and cultural criteria according to their own preferences and perceived choices. After a disaster, the humanitarian community can distort this decision-making by imposing or prioritizing certain criteria over others, biasing technical over cultural criteria. It is important that external assistance and interventions serve to help people make informed decisions about the built environment but not at the expense of cultural criteria they value more highly than outsiders do.

BOX 5.5 Trees in a tropical lifestyle: a neglected factor in reconstruction

Following a disaster, most agencies involved in reconstruction focus primarily on housing while the importance of preserving or restoring the natural resources that constitute an integral part of human habitats is commonly neglected. Rehousing disaster-affected people in multi-hazard-resistant houses is thus considered the priority, often without taking into consideration local culture, livelihoods and social organization, and how these factors relate to people's natural and built environment. This was the case for example in Tamil Nadu, India, where reconstruction in the aftermath of the Indian Ocean tsunami of December 2004 was characterized by an emphasis on building houses without realizing the importance of trees (Duyne Barenstein, 2010).

Before the tsunami, Tamil Nadu's coastal villages were embedded in a large number and variety of trees whose importance for people's culture and lifestyle can hardly be overemphasized. Like all Hindu communities, fisherpeople consider trees a symbol of life, immortality, fertility and generosity.

Beliefs associated with trees are expressed in practices such as the tree-planting ritual during wedding ceremonies, where the newly married couple jointly plants a tree. Tree products are essential ingredients for the performance of various rituals. They can be sacred, temples where gods reside, or represent human beings who have passed away.

Tree products are extensively used in every home and are also a valued source of income. They are connected to notions of health, protection, beauty and sacredness and are an important source of food, fodder, medicine and construction materials for housing, furniture and utensils. The products of trees are often sold to complement the income earned from fishing. For elderly men and women who can no longer engage in fishing and related activities, the products of trees may constitute their main source of income. Trees are a source of fodder for goats, which are a particularly important livelihood resource for widows and elderly people; they may be considered as poor people's savings as they can be sold in times of stress.

Trees are also related to the need for protection. In cyclone-prone areas they provide protection from the recurrent strong winds and many people were saved from the tsunami by holding on to trees. Trees surrounding houses provide privacy and are often planted in rows to grow into natural fences, to demarcate the homestead plot and also to serve as landmarks.

But perhaps the most important role of trees in coastal Tamil Nadu is to provide shade and thermal comfort (Duyne Barenstein and Pittet, 2013). In a tropical climate, the importance of shade cannot be overemphasized. Fishing communities' lifestyle is closely related to the availability of shaded areas; most of their productive and recreational activities take place outdoors under the shade of trees and, during the summer months, people often sleep outside. Trees define community spaces where people meet and nurture their social cohesion. Men traditionally mend their nets collectively under the shade of trees, while women and children relax and play under the shade of trees after completing their domestic chores. Under the trees people share information, joys and sorrows, and provide each other emotional support.

Most agencies involved in post-tsunami reconstruction did not recognize the fundamental importance of trees for coastal communities' well-being. Due to the need to maximize the number of houses to be built in a plot and to enable contractors to build more efficiently, in many villages thousands of trees were felled, while many new settlements were built on saline soils where no trees can grow. People thus found themselves in concrete houses with RC flat roofs in grid-patterned settlements without any trees and no shade. The absence of trees was described by many villagers as one of the worst consequences of agency-driven reconstruction as it was perceived to have severe consequences on their health, livelihoods and well-being. People commonly describe their new habitats to be "burning like fire" and associate



Mending nets in the shade of the trees in a Tamil Nadu village, India.
© Jennifer Duyne Barenstein

many of their health problems such as frequent fever, headaches, jaundice and skin diseases with the absence of trees and the fresh air and breeze that they used to provide. Many elderly people are severely affected by having lost an important source of livelihood. Due to lack of space and fodder, keeping goats has become very difficult. The loss of trees also affected people's diet; they now eat fewer fruits because they need to be bought, brought from other places and are expensive. The exchange of fruits and other tree products among relatives, friends and neighbours was previously a common practice that also contributed to social cohesion.

The felling of trees led to an annihilation of community spaces, which had detrimental effects upon the well-being of the people: loneliness, boredom, physical and mental health problems, worry about children, discomfort, tension, alcoholism, deep sadness and a sense of uprootedness were experienced by many people and were directly associated with the loss of the trees and related community spaces. People not only felt lonely, but actually can no longer rely upon reciprocal help, at least not to the same extent as before. What took place under the trees was not merely a sharing of news and fostering of friendship; the bonds created translated into a personal feeling of security and materialized in the various favours people performed for each other every day. The loss of community spaces has led to reduced interactions among people and to the weakening of social capital. For example, it used to be common and important, in particular among women, to borrow and lend each other small sums of money. The distance among them caused by the absence of communal spaces has now made it very difficult, if not impossible, to borrow money from others (Naimi-Gasser, 2013).

If reconstruction agencies had given more importance to understanding the local culture and lifestyles they would have realized the fundamental role of trees, that coastal communities have a strong housing culture and building capacity, and that with adequate support they would have been able to rebuild their villages by themselves. Sensitivity to people's needs and capacities would have resulted in more serious attention being paid not only to the construction of houses, but also to the social, economic and cultural significances of private and public spaces and to the many important functions of trees. ■

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LIVE, LET OTHERS LIVE
STOP

DISCRIMINATION
AGAINST FRIENDS
LIVING WITH HIV/AIDS



Culturally sensitive public health: the HIV/AIDS disaster and beyond

The relation between disasters and health is twofold. First, a hazardous event, social crisis or war might corrupt living conditions to such an extent that diseases, injuries or other acute health impairments occur. Such emergency situations often develop into what are termed ‘complex disasters’, which “challenge conventional views on development and erode the cultural, civil, political and economic integrity of societies” (IFRC, 2013). Second, diseases themselves can provoke disastrous conditions. The HIV and AIDS pandemic serves as a good example of this: its catastrophic effects are no less devastating than ‘classic’ acute disasters and have been termed a slow-onset disaster (IFRC, 2008; Stabinski et al., 2003). From a public health perspective, such disasters are particularly complex because a political process is first needed to acknowledge the hardship of those who are affected in order to officially designate a situation as a disaster. This can considerably delay intervention.

In humanitarian and public health action, the importance of what are often rather vaguely labelled ‘communities’, ‘local response’ and ‘resilience’ has been widely acknowledged. ‘Local’ includes beliefs, perceptions, attitudes, routines and practices ‘on location’, where the intervention takes place. It is here, however, where action, either routinely embedded in primary healthcare or in the form of exceptional disaster relief, often collides with understandings from different epistemes, worldviews, narratives and experiences – in short, from different ‘cultures’. These collisions occur either despite standards and guidelines in place, which claim to take account of other cultural framings of health and risk, or simply because these other interpretations, beliefs, societal framings and practices are not detected, not accommodated for, not understood or totally ignored or denied. In other words, barriers to a successful implementation of health-related measures can be attributed to what could be described as a ‘cultural insensitivity’ of public health.

Thirty years into the epidemic, the HIV and AIDS pandemic is a good example of a public health approach related to local culture. Culture is not only a local set of customs, beliefs and values. It can be interpreted more comprehensively as intrinsically tied to everyday practices, situations and organizational framings. This chapter shows that different, and sometimes opposing, cultures (such as ‘biomedical’ public health versus ‘traditional’ medicine) interact with each other. They sometimes find ways to operate together, and the chapter argues that it is important to take account of this in public health. While this chapter does

Advocating tolerance:
an HIV/AIDS campaign
in southern Zambia
against the discrimination
of people living with HIV
and AIDS (PLWHA).
© Fred Krüger

not advocate for alternative medicine where it does not work or causes harm, it does contend that biomedical public health programmes that ignore the fact that many people believe in, and practise, ‘other’ concepts of medicine and healing are not likely to produce sustainable effects.

People-centred approaches and local solutions in public health

The Red Cross and Red Crescent Movement and many other humanitarian organizations base their principles and standards for humanitarian response on the Humanitarian Charter. This charter acknowledges that people who are affected by a disaster should have “the right to life with dignity, the right to protection and security, and the right to receive humanitarian assistance on the basis of need” (Sphere Project, 2011). Living conditions are never homogeneous and, after a hazardous event or in a disaster, an unfavourable or dangerous situation that might have existed before may be aggravated for certain people. It is, therefore, essential for humanitarian action to differentiate and identify those who are, or have become, particularly vulnerable. “Not all individuals within a disaster-affected population have equal control of resources and power. People are, therefore, impacted differently on the basis of their ethnic origin, religious or political affiliation” (Sphere Project, 2011). Any assistance thus needs to be essentially “people-centred”, which implies the recognition of local capacity, effective participation or the sharing of information and also includes the right for the recipients of humanitarian assistance to complain and have their cultural practices respected provided they are in line with human rights (Sphere Project, 2011). Correspondingly, the IFRC, in its Code of Conduct, recognizes local culture, practices, knowledge and capacities. It states in its principles that “We shall respect culture and custom” and “We shall attempt to build disaster response on local capacities” (IFRC and ICRC, 1994).

The IFRC, with “millions of Red Cross Red Crescent volunteers [living] in rural and urban communities worldwide” (IFRC, 2013), has incorporated a cultural sensitivity into its policies and practice. The IFRC describes these local volunteers as its “eyes and ears”, as an effective early warning system. It can be claimed that, although there may be a significant overlap, ‘local’ and ‘culture’ are not the same – the term ‘culture’ should not be confined to local customs. This is not to say that customary or traditional local practices are not important; they may indeed often form an integral part of dealing with disasters and risks as, for instance, “burials and religious ceremonies and practices, [...] are often an essential element of people’s identity, dignity and capacity to recover from disaster” (Sphere Project, 2011). Culture does not stop at the local level nor is it confined to regions or nations. It is also not necessarily homogenous among members of a population group or within a ‘community’, but transgresses the boundaries of live contexts (see Chapter 4).

Cultures can be identified as expressions of ‘fields of practices’ where certain economic, religious, societal or political commitments based on respective assumptions lead to agendas, norms and organized actions. Reaching beyond (but encompassing) the idea of belief systems, customs, traditions, values or norms, ‘culture(s)’ are talked of as everyday routines and conventionalized practices, but the term can also be employed, for example, for cultures of political parties, media agencies, companies, in national political contexts or global economic doings, at local to global scales. Humanitarian assistance and public health schemes are thus also expressions of, and are forming, cultures.

Cultures perceived as integral parts of fields of practices, as commitments, agendas and actions, may coexist in a local setting, but not necessarily in harmony. They may collide, or be contested or ignored, and people or organizations whose actions are framed by different cultures might suffer from the consequences of these contests. The example of HIV/AIDS-related research in Botswana is used to explain the implications this has for public health and to illustrate the perspective, in this chapter, of culture and health. Many individuals who work in public health and in disaster management, or who are directly affected by calamitous health-related events, have observed that, in public health and humanitarian assistance evolving around HIV/AIDS, local nurses and other medical personnel have a good understanding of the needs and hardship of those living with HIV and AIDS. They are, however, often restricted in their actions by conditions governed at higher levels of their institutions.

HIV and AIDS and the local response in Botswana

Beginning in the early 1980s, HIV and AIDS were considered a major global health threat by researchers, medical personnel and health advisers, although some were initially reluctant to call the emerging epidemic a ‘disaster’. Doing so would have meant, in the eyes of some public health actors, conceding the inevitability of the catastrophe and accepting defeat (IFRC, 2008). Most experts were of the opinion, however, that the HIV pandemic could have been prevented had it not been for widespread inaction, indifference, denial, negative discrimination and stigmatization. Plainly, such opinions are normatively charged and can, to varying degrees, entail blaming ‘the other’. In the early years of the pandemic, homosexual men, then prostitutes and then, in an extreme generalization, various ethnic groups became targets of such blame for their allegedly promiscuous behaviour. Only when it became evident that HIV/AIDS was not only a deadly health threat for these specific and discriminated-against groups but also an economic burden of a national and global scale, were decisions taken to invest more in prevention, care and support. In 2000, a new global funding mechanism was introduced, the Global Fund to Fight AIDS, Tuberculosis and Malaria, which

was financed by governments, pharmaceutical companies and private sources such as the Bill & Melinda Gates Foundation. As HIV seroprevalence (rates of infection) soared in some countries, and larger portions of society became directly affected, there was no longer any doubt that the pandemic was a disaster ‘in its own right’.

The AIDS pandemic in Botswana

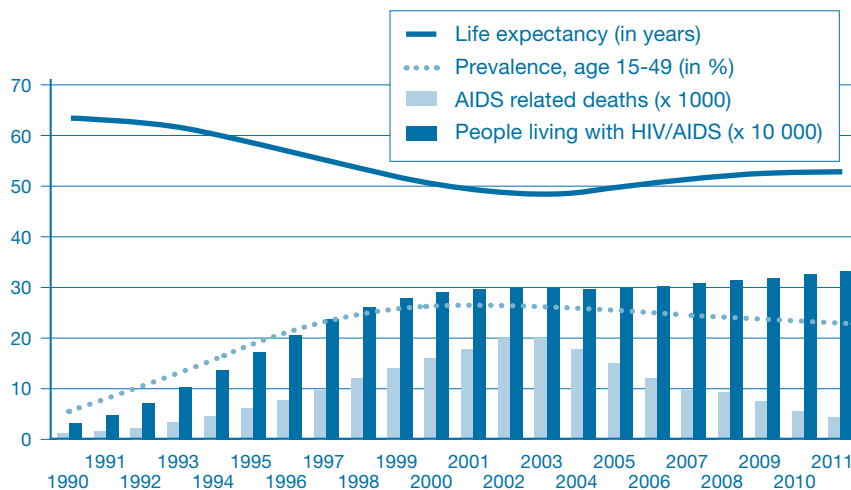
In Botswana, HIV seroprevalence among people aged from 15 to 49 years is currently at approximately 23 per cent (UNAIDS, 2014). Seroprevalence in pregnant women in this same age group is even higher, though it decreased from 37.4 per cent in 2003 to 30.4 per cent in 2011 (NACA, 2012). Despite large-scale awareness campaigns initiated by the Botswana government in the early 1990s, AIDS was rarely talked about in public due to widespread discrimination and stigma (Geiselhart, 2009; Geiselhart et al., 2008).

Efforts to contain the pandemic continued and universal treatment was introduced with government commitment and international aid. The Botswana HIV response included the nationwide introduction of an anti-retroviral (ARV) therapy scheme via the Masa programme (*masa* is Setswana for ‘new dawn’). This has somewhat reduced societal tensions. Stigma and discrimination of HIV-positive people are, by and large, matters of the past (Geiselhart, 2009). In Botswana, almost everybody has experienced the traumatic effects of HIV and AIDS, as the disease has cut across all sections of society. Before the introduction of Masa and ARV therapy, death was an ever-present feature of daily life. With the therapy, however, patients who had been deemed terminally ill were able to pick up their lives again. Not only were people living with HIV and AIDS (PLWHA) given a chance to live a life in dignity, but convalescence also became ‘visible’. This increased a public willingness to talk about the pandemic, its causes and its consequences and to engage with the illness and recovery of fellow human beings. In recent years, an increasing number of people have voluntarily had themselves tested for infection, realizing the advantages of undergoing treatment rather than denying their infection status. This new openness, however, has its limits – people who openly admit their infection still tend to be the exception than the rule.

In order to improve surveillance and to monitor the pandemic’s progress, the government introduced routine HIV testing in 2004. Everybody who is hospitalized is tested for HIV unless they explicitly object. Routine testing, however, met with serious objections from human rights activists. It could only be justified by referring to the extraordinary severity of the circumstances and by providing ARV treatment free of charge to people tested HIV-positive and in need of medication. This is a first example of cultures of different fields of practice colliding: the rationales, values and targets of the medical ‘apparatus’ clashing with those of human rights organizations.

The Masa ARV scheme dramatically reduced AIDS-related mortality in Botswana (see Figure 6.1). Despite its achievements, however, the scheme concealed some problems. The introduction of Masa occurred alongside a rigorous cutback of governmental support to self-help initiatives. Alternative therapy approaches, too, were largely marginalized. Obviously, mutual consent between governmental health institutions and other actors on concepts of health, and what adequate treatment should involve, had either not been reached or never been attempted. Many non-official solutions came under suspicion of competing with public health action or even of being counter-productive and a threat to the success of governmental health programmes. Practices that were potentially detrimental were highlighted while little effort was made to check in more depth whether they were indeed harmful or, on the contrary, able to support the patients' well-being, especially in areas of mental or emotional assistance where 'approved' biomedical measures had little effect.

FIGURE 6.1 Selected HIV/AIDS indicators and their trends for Botswana



Source: Data aggregated from UNAIDS, 2014. Note: Other UNAIDS statistics suggest that life expectancy at birth fell below 40 years in the early 2000s.

The main barriers for public health action can be participation and communication failures, as well as what is often termed 'ignorance'. In participation schemes, the actors involved can have difficulties in understanding what exactly outside intervening agencies intend or mean to communicate. Those for whom support is intended might, for instance, have long-standing interpretations of illnesses that differ from biomedical explanations or different priorities in regard to improving their well-being and livelihoods. In these cases, the target audiences are sometimes marked down as 'ignorant': not able to, not having been taught to, not willing to or not having the knowledge (and wisdom) required to understand

the situation at hand. This touches on the cultural background of the intervening activists and raises questions about perceptions of people affected by the disease which is discussed below.

Participation and ‘ignorance’

The importance of communication and participation (often, however, reduced to ‘listening to people’ in intervention practice) has been highlighted in all recent concepts of public health and disaster medicine actions. But how can understanding take place when, at the same time, ignorance is identified as a major barrier for behavioural change? How can it be decided whether people act out of ignorance? By definition, ignorance means a lack of knowledge or understanding, but on whose part?

Comprehensive prevention, care and treatment have saved tens of thousands of lives in Botswana. This healthcare intervention has been very successful, and prevented many HIV-related deaths and related morbidity. It has therefore made PLWHA support groups (which are trying to address stigmatization and discrimination) less relevant. Many local nurses and public health workers were convinced of the importance of self-help initiatives, support groups and networks of PLWHA, and some medical staff supported them privately or by providing access to equipment and meeting rooms without the explicit consent of their employers. Despite this, however, governmental awareness of the health-supporting benefit of these groups was lacking and funding from a higher level of administration was cut. As a result, most of these support groups were dissolved, and thus a retreat and a space for articulation for those who felt discriminated against in the HIV/AIDS crisis were lost. There is, indeed, evidence for the benefits of actively involving PLWHA in the response to the pandemic (see Box 6.1).

BOX 6.1 Optimizing HIV treatment through communities and PLWHA

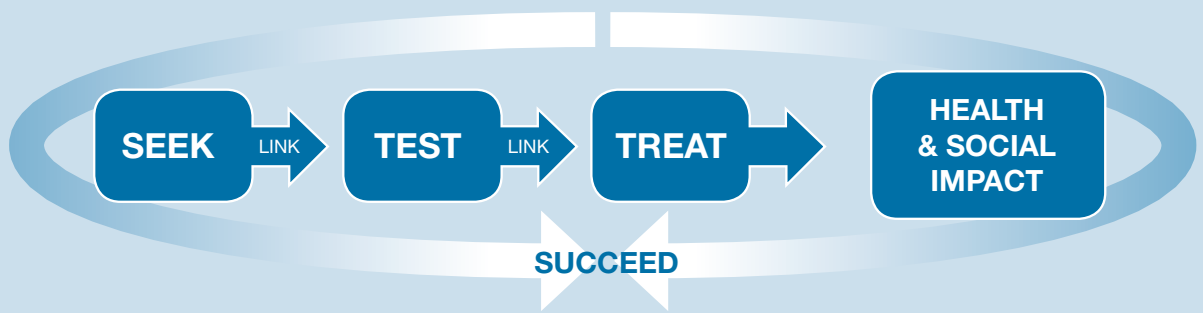
A growing body of evidence highlights the benefits of community-based approaches, which include delivering HIV testing and counselling (HTC); maintaining people on ARV therapy and dispensing drugs; supporting adherence; retaining people in care; preventing new HIV infections; improving service quality, health outcomes and quality of life of PLWHA; and ensuring their dignity and protecting their rights.

Community health workers or volunteers are lay people who have received standardized and nationally endorsed training outside the nursing, midwifery or medical curricula. In many contexts, these volunteers include PLWHA. In addition to taking on the role of a CHW, PLWHA are peers and may thus (with adequate training and support) provide the full range of peer-led, -driven and -supported interventions proven to support PLWHA effectively throughout their health and life’s journey. Moreover, PLWHA can ensure that HIV programmes are relevant, appropriate, accessible to and accepted by the end-user, i.e., the person living with HIV (GNP+/UNAIDS, 2013).

The treatment cascade

One of the main goals in HIV response is to reach everyone at risk of HIV and everyone living with HIV: **seek**, and link them as quickly as possible to HTC to know their HIV status: **test**. Once diagnosed, people should have access to appropriate prevention, care and support services that meet HIV-related and other health and social needs of the person and their families: **treat**. They need to be assessed for ARV therapy eligibility and offered the therapy in a timely manner, they should receive the support needed to ensure long-term adherence along with retention in care and re-engagement of people lost to care: **succeed**; and achieve sustained viral suppression (i.e., a low amount of HIV virus in the PLWHA's body, thus reducing the person's risk of transmitting the virus to others), so that over time an impact at population level can be attained: **health and social impact**. Together, these steps have become known now as the 'treatment cascade' (WHO, 2013). A simplified and adapted version of the cascade is shown in Figure 1.

FIGURE 1 The treatment cascade



Source: Adapted from IFRC and GNP+, 2014.

The role of community-based support, including support provided by CHWs and PLWHA, in each step of the treatment cascade is vital. ARV therapy is not about access to medicines alone. A holistic approach to supporting PLWHA, their families and communities requires that they be in line with Positive Health, Dignity and Prevention (PHDP) programmes and interventions to:

- empower PLWHA and their networks
- promote health and service access
- promote and support gender equality
- promote and support human rights
- prevent new HIV infections
- promote and support sexual and reproductive health and rights
- provide social and economic support
- measure impact.

This, in turn, will lead to increased access to evidence-informed, high-quality and rights-based HIV and broader health services that support individuals living with HIV in making choices that address their needs and allow them to live healthy lives, free from stigma and discrimination. It will also expand and improve existing HTC, care, support, treatment and prevention programmes that are community-owned and -led, and create opportunities for PLWHA to empower themselves and their sexual partner(s), rather than experience barriers. Lastly, it will increase investment in community development, networking, capacity building and resources for community-based organizations and PLWHA networks.

If gaps in the treatment cascade are to be closed, community engagement in service planning, delivery, monitoring and evaluation is also essential. As non-clinical issues are often the most significant barriers to service access, communities are well placed to provide leadership and support to address these issues. This is especially true for key populations, who face acute challenges in accessing services through mainstream health systems in many contexts. ■

But how do stigmatization and discrimination occur? In modern cognition, HIV- and AIDS-related stigmatization and discrimination are often regarded as an effect of the disease rather than one of language. Metaphors used in the HIV/AIDS context can, however, be more devastating to the identities of those who are infected than the disease itself (Sontag, 1990). Moreover, the assumption of a modern causal chain of contagion effectively shifts responsibility to individuals. In awareness campaigns, people infected with the virus have been stamped foolish or lacking in judgement (see photo below). People living with HIV and AIDS were even identified as potential murderers (as has happened in an awareness campaign in the 1990s; see photo below). Such campaigns only bolstered denial and aversion of getting tested, as people became afraid of becoming social outcasts because of their infection status.

A discriminatory poster displayed in Botswana in the early 2000s (right); a 1990s billboard indirectly accusing PLWHA of potential murder. © Klaus Geiselhart (right); Fred Krüger (far right).



Such stigmatization and discrimination was in fact brought about by the label 'HIV/AIDS'. As long as AIDS-related conditions were referred to by indigenous names (for example, *boswagadi* or *meila*), they were linked to culturally established ideas about what their roots and causes were. They were treated by traditional doctors long before 'other', modern explanations surfaced (Rakelmann, 2001; Tabalaka, 2007; see also Mathangwane, 2011; Geiselhart, 2009). In short, these established ideas explained certain phenomena and health-related conditions and made them comprehensible and meaningful to the people affected. In the course of the biomedical healthcare intervention, meanings shifted. Indigenous knowledge was often displayed as inadequate, untrue or mythical. Modern biomedical knowledge was promoted as being superior, while some traditions were condemned as supporting the spread of HIV. Participatory projects with traditional healers were introduced, but healers were not given equal footing. Healthcare agendas were, and still are, set elsewhere, as John P. Setilo, chair of a healers' association, explained in an interview with the authors: "They concentrate maybe on HIV/AIDS. Nowadays there is diarrhoea. So they will workshop us on diarrhoea. And that's it" (Setilo, 2012). In principle, traditional healing systems, due to their low level of formalization, are very flexible and may easily adopt new influences (Ingstad, 1990; Andrae-Marobela et al., 2010). But this requires an attempt to acknowledge the potential of healers and to engage them in a process of communication. The influence of traditional healers on people's health-related perceptions must not be underestimated – healers can, for instance, serve as good mediators between different understandings of disease, health and healing.

This chapter is not promoting traditional medicine (or spiritual healing or witchcraft) as being superior to 'modern' approaches. Traditional medicine may support affected people's well-being, but it may also have no effect at all or even be dangerous and harmful. This text aims at showing that different cultures (as expressions of different health-related fields of practice) coexist and sometimes collide. As many people believe in traditional medicine, it would be wrong to ignore it and even more so not to try to work with it, i.e., not to take account of it in public health.

With respect to AIDS-related public health action, many healers have felt patronized and forced into a parallel realm of practice (see Box 6.2). The consequences are manifold: messages delivered by public health agents may no longer reach healers and their clients, patients may be excluded from effective biomedical treatment and traditional healers' approaches and therapy concepts may go unnoticed in modern healthcare, despite their positive effects on treatment and recovery. The latter is of particular importance, as it has implications for social cohesion. If patients experience positive effects of alternative healing practices but these practices are unacceptable to a larger part of society, or not appreciated

by physicians or public health personnel in the biomedical realm, discrimination of these patients may follow (Barcan, 2010). Also, healers are generally more ready to refer patients to clinics or doctors than vice versa. Cooperation with spiritual healers is often clandestine. As Barcan (2010) noted, “The interchange between the medical systems works in two directions. Although it is markedly asymmetrical, both sides have something to lose. A medical psychic [healer] is at risk of being publicly and critically evaluated by sceptical doctors and patients. But so too any GP [general practitioner] who works with a medical psychic puts his or her own reputation at risk.”

Promoting involvement of people based on the assumption that this mitigates ‘ignorance’ is thus a tricky undertaking. Participation and inclusion are not simply about ‘listening to people’ and getting to know their views and needs. They imply a willingness to understand – one which reaches deep into a broader notion of culture and which might even involve having to discard, at least temporarily, the rationality of modern healthcare ideas and their particular notions of logic, knowledge and truth.

ARV adherence as a cultural process

Contestations of ‘modern’ or ‘traditional’ healing, and the blaming processes described above, can be attributed to different cultural framings where understandings of health collide. But even when there is no obvious clash, culture remains an important factor in public health. The degree to which HIV-infected people follow medical advice and stick to the prescribed regime of their ARV medicines is crucial for both the efficacy of the therapy and the effectiveness of the ARV scheme. In fact, this adherence is a major factor in the long-term success of the whole therapy programme. Abandonment, or even a short interruption, of the lifelong treatment may allow the highly mutable virus to rapidly develop drug-resistance, with devastating consequences for the therapy programme in Botswana and elsewhere. The preconditions for adherence, and the potentials of its success or failure, are not only rooted in the medical sphere but also embedded in, and constituted by, socially and spatially disposed everyday practice, i.e., culture (Krüger, 2013). It is, therefore, of paramount importance to monitor closely the socio-economic and socio-cultural conditions of adherence.

Adherence cannot be taken for granted in all everyday situations. Botswana’s Masa scheme, therefore, tries to secure adherence through an array of measures which have so far helped to minimize treatment interruptions or abandonment. However, adherence is largely centred on patients. Other actors, the socio-spatial environment and non-medical aspects still receive little attention: what will the effects be when patients have to take their medication in public, at the workplace, in view of their colleagues? Will they be stamped as unfit and frowned upon? Will their work-mates steer clear of them for fear of contagion? Will they postpone or skip intake

as a consequence? How does having to travel for hours (or even days) to a clinic in order to receive a new weekly or monthly dose of pills affect family life or work, and vice versa? These are only a few examples of (potential) barriers to adherence, of how it is linked to the social logics of health and risk, and how it is deeply embedded in everyday practices. Here, once again, is a cultural challenge: a medical concept that assumes compliance (based on deference and cultural alignment) on the one hand and, on the other, individual behaviour that is linked to, for example, fear of people's perceptions or the loss of privacy and intimacy. Adherence must thus be interpreted both as biomedically mandatory and as a cultural process that needs to be taken into account in order to ensure the long-term success of AIDS-related public health action. Doctors face many problems as they are expected to discuss all of these factors in their short consultations with their patients. The latter, therefore, need support from outside the (bio)medical realm. Acknowledging adherence as a cultural factor is all the more important as mortality has drastically decreased thanks to medication, and the number of people living with HIV/AIDS is increasing (see Figure 6.1).

BOX 6.2 What is traditional healing? WHO guidelines challenged in Botswana

According to a 2002 WHO directive, alternative healing practices should be integrated into national health systems, not only because some countries might fail to introduce nationwide access to public health services, but also because alternative healing has been found to be gaining acceptance, even in high-income countries (WHO, 2002). Many alternative or traditional healing techniques have proven efficacy or have at least shown that they can contribute to the well-being of patients.

Many countries have already established legal cooperation between their national health systems and practitioners of complementary medicine. Botswana is one of the last countries in southern Africa where such a process is still pending, and a bill which would have introduced such cooperation was rejected by its parliament. Referring to local varieties of traditional healing in Botswana, Moagi Gaborone, the local WHO representative, notes: "Traditional medicine is a very broad area. It's very difficult to come up with a definition that covers the whole area [...] of this practice" (Gaborone, 2012). According to Gaborone, there is a lack of standards, such as for exact doses of medicinal herbs.

John P. Setilo, president of the *Baitseanape ba Setso mo Botswana* (association of traditional healers), offers a different explanation: "Some officers, because of their religious beliefs, [...] don't feel comfortable with letting such a bill go through. [...] People tend to equate witchcraft to the practice of traditional medicine" (Setilo, 2014). He sees hypocrisy on the part of people who live modern lifestyles and pretend not to have faith in traditional belief systems or medicine but who would still consult a healer for assistance with relationship problems, bad luck or economic hardship. Setilo states that even some politicians consult healers, especially when looking for a way to win election campaigns.

Both of these statements point to three serious issues. First, despite healers calling themselves 'traditional doctors', the term has developed historically as a category to differentiate healers from 'modern doctors'.

There is no explicit definition of the techniques these healers are using. Second, the rationality of traditional healing based on spirituality is incommensurable to modern understandings which often assume a strict causality of natural processes (see Foucault, 1973). Third, wherever spiritual healing is practised, witchcraft and sorcery can be found as well, spreading an economic system based on fear and retaliation.

A traditional healer in Botswana (known as a *ngaka* or *sangoma*) relies on spirituality, especially when diagnosing by means of an oracle. As part of their training, healers say they develop the ability to enter a state of consciousness in which ancestors, and in some instances natural spirits and god, give them knowledge about clients, herbs and treatment. By connecting themselves to the spiritual world, healers can identify the forces that are harming their patients. In treatment and rituals, these negative forces can be appeased, retaliated against or repelled so that a patient can regain spiritual integrity and thus recover from illness.



Sangomas dancing in order to gain spiritual insight. © Klaus Geiselhart

In modern conceptions, transcendent entities such as spirits could never justify medical insights. However, if the existence of spirits is accepted, the practices of spiritual healers do not appear to be irrational at all. When spirits are appreciated as authorities, intuitive knowledge gained directly from them must be considered as a valid insight. Spiritual healing can be regarded as a distinct approach to medicine because its practices, reasoning and knowledge form a coherent system which permanently confirms itself in the everyday dealings of the people involved in it. Not

only healers claim the success of their treatments; clients, too, report experiences of healing. Anthropologists (see, for example, Kirmayer, 2004) and psychoneuroimmunologists (Money, 2001) have found evidence that symbolic rituals can be physiologically effective.

There is, however, a 'dark side' to spirituality, as not all spirits are morally good. The capacity to interact with a spiritual world also provides the opportunity to unite and form alliances with harmful spirits. Employing such spirits is regarded as witchcraft. No specific techniques of witchcraft can be clearly separated from those beneficial to health, and even healers themselves find it difficult to draw the line between the two. Distinguishing witchcraft from healing is primarily a moral distinction based on whether intentions are good or bad. What may help one client might harm other people, especially when requested services are to foster economic success or good luck. Fees for healing services are small, but services associated with witchcraft are often well paid. This economic reality gives healers an incentive to engage in witchcraft.

In Botswana, *botho* is a metaphysical notion of the interdependence of all beings in the universe. It includes the moral obligation to be aware of oneself as linked to others and thus to be concerned about the good of fellow human beings. *Botho* is said to bring “healing where there is no cure” (Mmualefhe, 2007). Discussing traditional healing in terms of *botho* might help in formulating an obligation that healers refrain from witchcraft and other actions that harm people. The introduction of modern medicine required a similar assurance of honesty, and this was codified in the Hippocratic Oath.

Believing in spirits is often associated with superstition, but this disregards the therapeutic potential of spiritual healing. Witchcraft is also a reality for people living where such spiritual beliefs are prevalent and has both societal effects and health implications. It is, therefore, comprehensible that Botswana is still carefully considering how traditional healing can be integrated into the national health system as WHO suggests. To do so, innovative solutions are required to bridge the gap between divergent worldviews. Unfortunately, the political process of such bridge-building seems to have come to a standstill. ■

How public health and humanitarian action are culturally embedded

The Botswana example shows that the Masa scheme developed a specific trajectory, according to its targets, values and programme strategies: medical and public health competence and financial, political and administrative resources were focused on mainstreaming ARV therapy into the national HIV response. Implementing the Masa programme involved a vast number of decisions, but choices could have been made differently. Where the Masa scheme crossed the interests, perceptions and values of other fields of practice such as self-help initiatives, healers or human rights organizations, however, implementation was more a case of hegemonic power than one of participation and empowerment.

Because the traditional healing systems remain influential on people’s perceptions, there have been attempts recently to involve healers in their capacity as mediators in a new project commissioned by the Southern African Development Community. As John P. Setilo comments: “Since last year we are going round the country training traditional doctors on issues of HIV/AIDS so that they can teach others in their respective regions about [these] issues. Traditional doctors in this country are happy with that” (Setilo, 2014). Why did such involvement and communication, normally regarded as essential factors of disaster-related action, not happen earlier?

Tracing the viewpoints and attitudes of people who are (potentially) facing risks or who have been hit by a disaster, and actively including recipients of support in public health action, is unanimously deemed essential in public health guidelines. An obstacle for participation, however, can often be found within the logic of an agency or organization involved in health-related disaster risk reduction (DRR).

As already stated, community health workers and nurses engaged at grass-roots level are often well aware of the needs, rationales and constraints of those who are affected by health threats. However, such empathy and cultural sensitivity seem to vanish at the higher administrative levels of intervening institutions and in political and economic contexts. At these levels, decisions are made more on the basis of fixed agendas and goals, and it is mandatory for all employees to follow these agendas or meet the targets. Decisions are governed by the dynamics of huge administrations and the need to manage financial and political issues plus complex machineries of logistics with regard to, for example, relief supplies. Highly qualified experts are supposed to solve problems efficiently, based mainly on definitions which stem from biomedical, technical or administrative understandings. This culture of the humanitarian agency masks what is known at the grass-roots level, despite a willingness, in principle, to consider 'local' ascriptions to illnesses and well-being. Understanding what other people understand, and of course incorporating this information into the design, implementation or modification of assistance schemes, is a huge task for public health agencies.

Successful approaches in times of disasters are often those that build on existing systems rather than 'import' personnel whose aim is to intervene, train and leave (Barron, 2004; Bughra, 2006). It is obvious that giving local health workers a voice in their organizations, and not letting their experience with local cultures fade away in the meanders of higher administrative levels, is essential. Involving people directly affected by health threats is, of course, equally important. When differing concepts of disease, health and well-being are not noted or are deliberately ignored, public health initiatives, grounded as they are in everyday routines and practices, are unlikely to tap their full potential. Beliefs, persuasions, customs, norms or taboos often 'overrule' the importance of calculated physical threats and prevent people from cooperating in actions that seem self-evidently beneficial from the viewpoint of an outside public health or DRR expert. 'Health' as a complex and rather abstract concept competes with other priorities more directly linked to seemingly immediate well-being: water, food, shelter or protection.

Diverging interpretations of what constitutes health and healing may lead to the most vulnerable or marginalized missing out on public health assistance. The 2008 *World Health Report* highlighted the renewed importance of primary healthcare commitments, originally laid down in the Alma Ata Declaration in 1978 (WHO, 2008). The report stressed the danger of deteriorating social cohesion in many countries. Health systems, seen as a key element of the architecture of contemporary societies, have had increasing difficulties in providing services that meet people's expectations and needs (WHO, 2008). Social justice and the right to better health for all, clearly stipulated in the Alma Ata Declaration, have not been translated everywhere into tangible public health reforms. The involvement of local stakeholders and, as such,

the inclusion and empowerment of those whose voices and choices have been neglected or negated, is deemed a core element in the design or reform of public health action.

What can institutions that engage in public health and health-related DRR learn from these observations and the HIV/AIDS example above?

- Health issues are linked to everyday life and cultures as expressions of fields of practices. Not all public health actions, even if they are scientifically proven, will be accepted willingly if they are not fully comprehensible or if they contradict long-standing interpretations or endanger established power relations or economic interests. In addition, if people do not believe in a biomedical theory of disease, and have an alternative causation framework, this should be acknowledged as a relevant and legitimate expression of culture and people's everyday experiences (as long as it is not harmful). It should not be ignored or dismissed as ignorance.
- Cultures also exist within public health institutions. It should be ensured that competence at grass-roots level is transferred to higher levels of decision-making and concept framing. Observations and opinions should be taken seriously even if they are not immediately comprehensible or contradict common assumptions and agendas.
- An interpretation of situations and conditions as 'disastrous' by one group of involved actors may not be shared by others. Cultural traits that may determine what actually constitutes a risk or a disaster should be reflected upon. Preventive and curative public health action should be planned such that messages delivered by public health agents also reach those who choose to remain outside the domain of biomedical healthcare or are excluded from it.

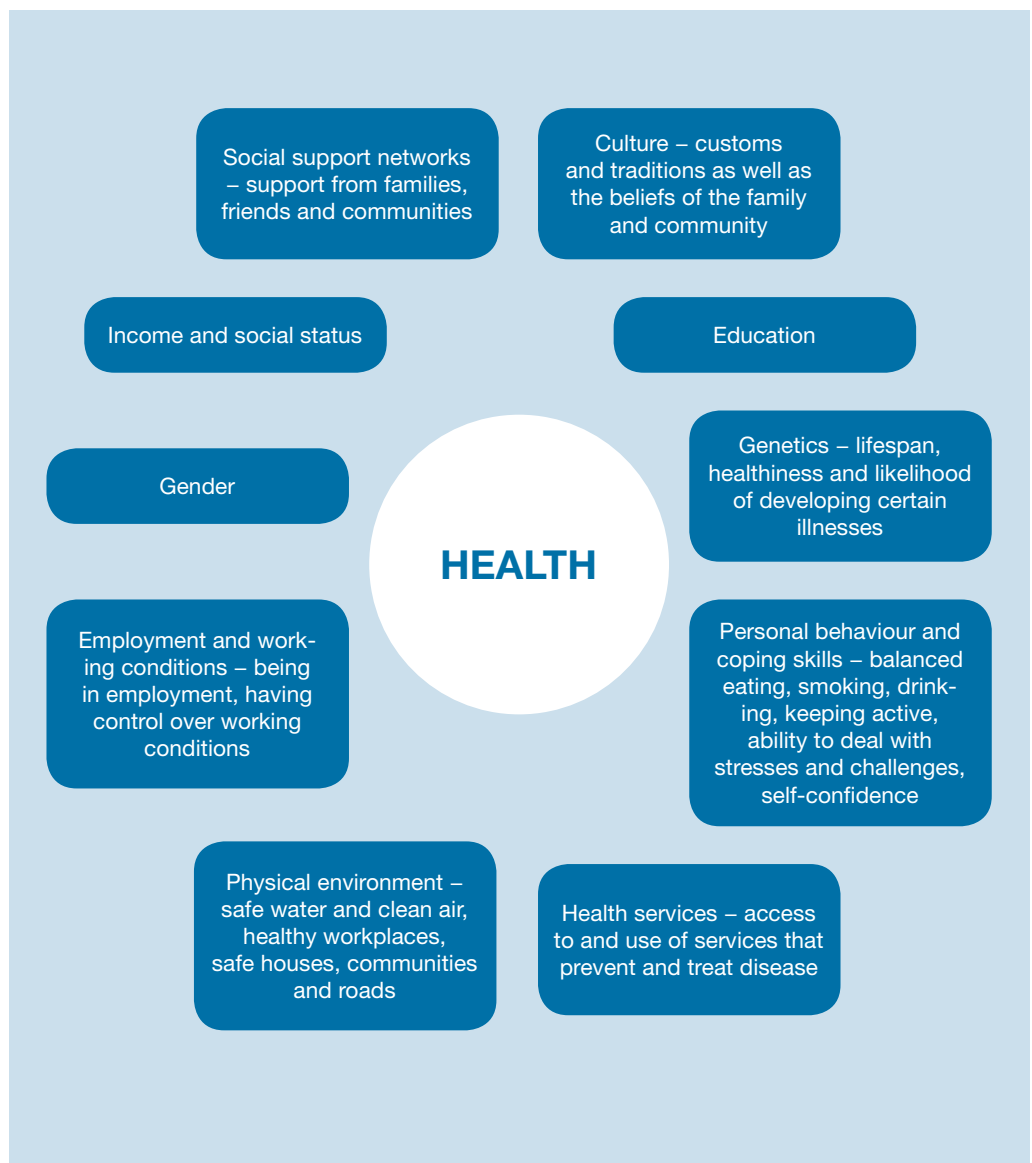
A comprehensive model of health

Many of the social determinants of health identified in the HIV/AIDS example and linked to culture and its implications for public health action are included in the World Health Organization (WHO) comprehensive model of health: "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO, 1948; Üstün and Jakob, 2005). This concept implies that health is the result of a complex condition dependent on a multitude of influencing factors which stem, above all, from living and working conditions, the physical environment and people's individual characteristics and behaviours (WHO, 2014a; see Figure 6.2).

Understanding health as a comprehensive concept acknowledges that it is deeply embedded in culture. This is further revealed in public health schemes that are

based on the integrative approach to health and touch on local living conditions and everyday practices (as in the combat against pneumonia and diarrhoea) or in health challenges linked to globally intertwining economic interests that have raised considerable public awareness (for example, workplace safety). Box 6.3 gives a more detailed account of these two examples.

FIGURE 6.2 The determinants of health

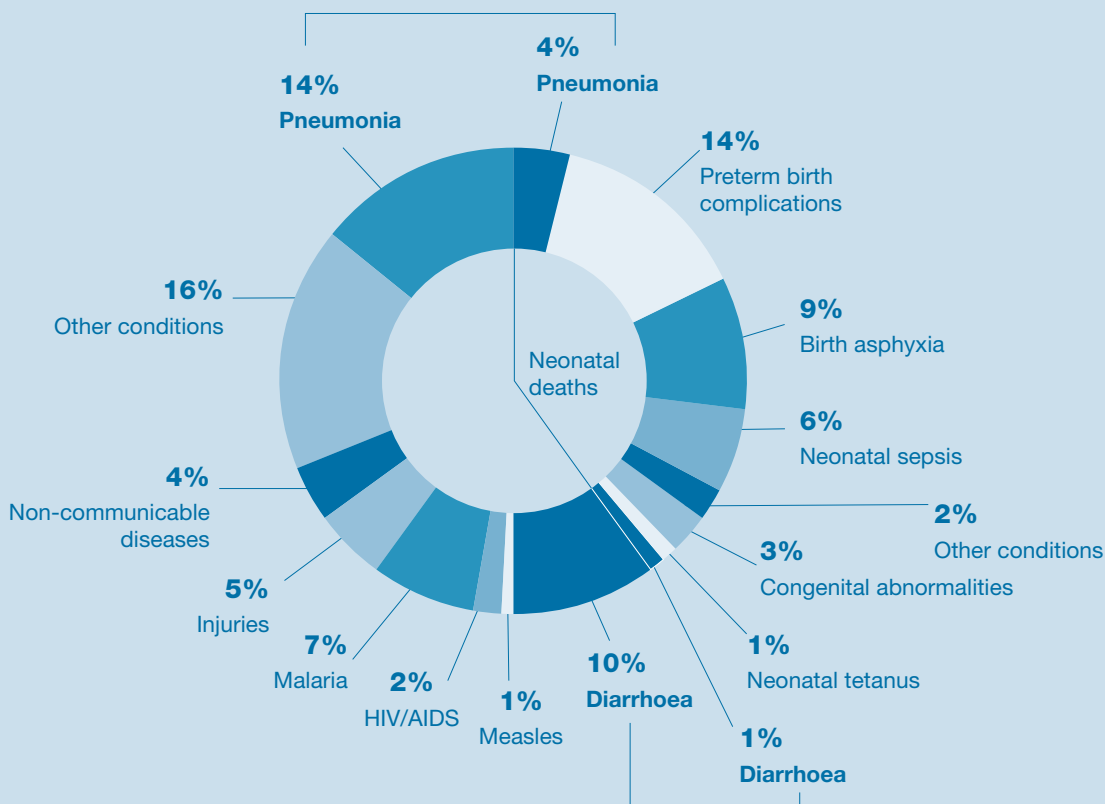


Source: Adapted from WHO, 2014a.

BOX 6.3 Linking health-related guiding principles and culture

A comprehensive model of health, listing a vast range of influential factors (see Figure 6.2), has contributed to achievements made, for instance, in the provision of drinking water or the marked reduction of child and maternal mortality worldwide. Nevertheless, numerous health challenges remain to be resolved. For example, ending preventable pneumonia and diarrhoea deaths among children remains a major goal in public health intervention. These two diseases alone account for 29 per cent of deaths of children under 5 years of age and result in the loss of 2 million young lives each year (WHO and UNICEF, 2013; see Figure 1). Children who are poor or hungry are more likely to become infected by these diseases than others – in general, 35 per cent of deaths in children under 5 years of age are associated with malnutrition (WHO and UNICEF, 2013). Tackling cases of pneumonia and diarrhoea does not require major advances in technology. These children are dying mainly because they have no access to adequate healthcare services. Only about one-third of children with diarrhoea or suspected pneumonia receive therapy or antibiotic medication. Universal health coverage remains a prime target for global health policies (WHO, 2014b).

FIGURE 1 Diseases and conditions accounting for deaths of children under 5 years of age



Source: WHO and UNICEF, 2013.

Efforts to tackle the global problem of pneumonia and diarrhoea in children present a good example of the logic behind the concept of health outlined in Figure 6.2. An integrative view of health has helped to design intervention frameworks and establish roadmaps and guidelines for national governments and their partners to plan and implement appropriate public health measures. The Global Action Plan for Pneumonia and Diarrhoea provides an integrated framework of key interventions to prevent and treat these diseases. It consists of three core actions: protect, prevent and treat. Also, it identifies not only healthcare facilities as 'delivery platforms', but also families, schools and other societal institutions. All of these actions and platforms are inseparably connected to, or are expressions of, cultural factors.

Public health achievements are linked to guiding principles and the definition of health standards as well as legal regulations on health and safety. The formulation of such norms and regulations, i.e., the negotiation of what is deemed 'acceptable', 'necessary', 'mandatory' or 'intolerable' is again an expression of cultural practices. Workplace safety is one of many fields where health issues and the enforcement of regulations have become of growing national and global concern. Public awareness of shortcomings in occupational health and safety has increased, sometimes triggered by tragic events such as the collapse of a garment factory in Bangladesh, where in April 2013 more than 1,000 employees were killed and another 2,500 workers injured. A year after the collapse, thousands of survivors took to the streets, with the disaster's anniversary marked by protests where campaigners called for better compensation and for the creation of working environments in compliance with the International Labour Organization convention (Mustafa, 2014). The Bangladesh case demonstrates that occupational health and safety is no longer at the whim of local employers but is an international responsibility in a globalized world – at least when it comes to production sites of consumer goods that are distributed to higher-income countries, where buyers are taking an increased interest in the working conditions in regions where merchandise is sourced from. ■

The comprehensive understanding of health underscores the importance of linking public health action, which is often designed at higher levels of international and humanitarian agencies, to local fields of practice. A key concept that has been increasingly promoted in recent years to enhance involvement of local actors in health promotion efforts is the employment of community health workers (CHWs). CHWs are usually members of the communities they serve. Because of their often intimate understanding of local health-related challenges, and the trust they enjoy among their group, they may serve as intermediaries between health services and the people affected by health threats and impairments (see also Box 6.1). Earlier assessments of the outcome effectiveness of CHWs have shown inconclusive results, with some projects not meeting expectations partly because they lacked a clear focus of CHW activities or slack documentation (Swider, 2002). Also, the community concept as such is vague and hampers more effective outcomes (see Chapter 4). However, local ownership of public health action can indeed be increased through CHW outreach. And there is no doubt about the potential of CHWs to better understand their clients' language and cultures, to deliver messages that can be understood, and to

detect perceptions, feelings and needs in the field (see Canadian Red Cross, 2014 for one of many examples; CHWCentral, 2014 for an overview; Catley et al., 2014 for related participatory impact assessments).

In this vein, for more than 30 years, information, education and communication have been core parts of a public health approach to empower people regarding their health actions. This client-centred approach aims to foster positive health practices individually or institutionally to contribute sustainably to healthy behaviour (WHO, 2001a). Abundant experience-based information on how to communicate with populations of different origin, education and tradition (and, thus, culture) exists, although it is not always put into good practice. Surveys on knowledge, attitude and practice can find out what a target audience 'knows' (this is often underestimated, as for example with teenage pregnancy in Box 6.4), what attitude different actors have and whether behaviour change is actually taking place or not.

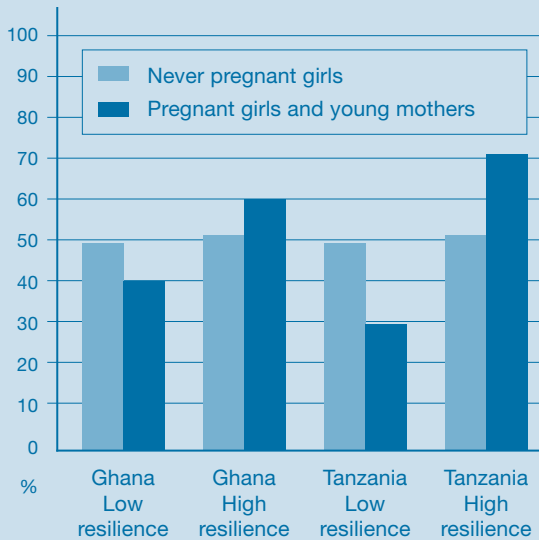
BOX 6.4 Unplanned and unwanted teenage pregnancy in Ghana and Tanzania

More than half the world's population is under 25 years of age (WHO, 2001b). Adolescents hold the key to the future yet many of them must overcome numerous challenges to lead healthy lives. One crucial concern is teenage pregnancy, which for teenage girls is fraught with risks. Pregnant girls may be ostracized by their families and might be condemned to live in poverty as single mothers (WHO, 2006). The most severe threat, of course, is the risk of dying during childbirth, which is higher than in adult women. Thus teenage pregnancy is an important public health issue. To develop culturally sensitive policies and interventions, it is necessary to understand more about how adolescents in different contexts deal with unwanted and unplanned teenage pregnancy. A study funded by the Swiss National Center of Competence in Research (NCCR) North-South aimed at learning more about factors that can contribute to building girls' reproductive resilience towards unplanned and unwanted teenage pregnancy (Pfeiffer et al., 2013). The study focused on female adolescents aged 15 to 19 years in urban and rural sites in Tanzania (Dar es Salaam and Mtwara) and Ghana (Accra and Begoro). Altogether more than 2,500 female adolescents were interviewed, of whom 16 per cent in Ghana and 15 per cent in Tanzania were either pregnant or already mothers.

A surprising proportion of the interviewed girls in both countries were 'resilient' as defined in the study: the ability of young people to overcome risks. In Tanzania and Ghana about half of the women who had never been pregnant fell into this category (see Figure 1). They could get the information and social, cultural and economic support they needed to avoid pregnancies. An even higher proportion of pregnant women and young mothers were resilient in terms of being capable of dealing with pregnancy in the wider social context. The majority of respondents in both countries knew how to avoid or tackle health problems that might affect them or their babies, and they could get the social, cultural and economic support to do so. Practices, such as the mobilization of different types of resources, are shaped by cultural norms and taboos. Only girls that maintained a good social reputation and acceptance within their socio-cultural environment were able to get the needed support. Many expectant or actual mothers managed to navigate

through these norms and tried to deal proactively with the demands of pregnancy and childbirth. These findings defy the common stereotype of adolescent mothers as ignorant and unprepared. It is important to look at these girls as active social agents who creatively influence their own lives while juggling the various cultural expectations directed towards them. While childbirth may be a turning point for female adolescents, it can also offer new opportunities for them to break away from the past.

FIGURE 1 Ability to cope with unwanted and unplanned teenage pregnancy among girls aged 15 to 19 years in Ghana and Tanzania



Source: NCCR North-South survey research.

A young mother in Tanzania. © Matthis Kleeb

Girls turn to different people for advice on how to avoid pregnancy or deal with it. According to traditional norms, young females in both Ghana and Tanzania receive sex education from relatives such as aunts and grandmothers, rather than from their mothers. However, this is changing as a result of increased mobility due to formal education and migration to towns. Findings from the survey showed that, today, parents and other caretakers are particularly important sources of information on sexuality and teen pregnancy. But whether they can contribute to resilience building also depends on the socio-cultural context. While for girls in Accra who had never been pregnant, it is the parents and other caretakers who strengthen their resilience, in Dar es Salaam, this could not be observed. Results highlight that the critical role of parents in providing sex education to girls cannot be overemphasized. It is, therefore, important to increase the skills of parents, relatives and other caregivers to communicate in a well-informed and sensitive way about sexual matters with young people.

Family members, partners and peers may, however, not be very reliable sources of information about sexual health and pregnancy. Mass media such as radio, television and magazines aimed

at a young audience can provide young people with accurate information and increase their resilience. Cultural values, norms and taboos influence how youth select, rearrange or reject different types of information. According to the survey, girls who used different media as sources of information were more resilient regarding teen pregnancy than their peers who did not. However, access to media such as TV and magazines is easier in urban areas

In Ghana, for instance, in urban areas in particular, television is widely watched and youth programmes such as *Campus life* are popular among adolescents. However, these programmes do not focus specifically on sexual and reproductive health but on issues of everyday life in general. Reaching youths through programmes that inform about sexuality and teenage pregnancy offers untapped potential.

In Tanzania, context-sensitive youth magazines focusing on reproductive and sexual health appeared to be very effective in terms of resilience building for girls who had never been pregnant. Young girls who were reading the magazines knew more about how to protect themselves against teenage pregnancy. Such magazines should also be targeted at young mothers and mothers-to-be to inform them on how to reorganize their lives during pregnancy and after birth to avoid the risks associated with teenage childbirth.

Current biomedical concepts of teenage pregnancy as a risk should be critically reflected upon when used in an African context. Focusing on the strengths and capacities of young people rather than on their weaknesses opens new possibilities to reduce unwanted teen pregnancies. It is thus of key importance to learn from the young people themselves about their sexual and reproductive health realities and to include their lived realities and culturally embedded everyday practices in health policies and interventions aimed at preventing unwanted teenage pregnancies. ■

Health, cure, economy and security as cultural traits

As can be seen in the example of HIV and AIDS in Botswana, customary, traditional and spiritual practices constitute an important variant of care and treatment in the broadest sense (Bankoff, 2014). Indigenous healthcare is deeply rooted in societal traditions and concepts of health and healing may form a part of the ethnic identity of local populations (Reeve, 2000). Healthcare intervention is still largely constructed according to western or northern norms and practices. One possible result of this is an unnecessary medicalization of normal human reactions simply because they are outside the accepted clinical model (Bughra, 2006; Bankoff, 2014). In disaster circumstances in particular, mental stresses, such as a feeling of loss or prolonged grief, or a normal response to fear are too easily turned into pathological disorders. Labelling suffering as a disorder through the use of standardized medical definitions and categories might in fact lead local people to invalidate their own culturally accepted methods of dealing with health threats and challenges (Bankoff, 2014; Ganesan, 2006). Gronemeyer (2005) called these effects of public health intervention the “collateral damage of help”.

It is not sufficient, however, simply to recognize the existence of other concepts of healing and care. A dualistic notion of modern versus traditional hampers public health success if these concepts remain unconnected. Traditional healers play a crucial role in linking the two, as they can become mediators between governmental public health systems and clients who have faith in traditional healers' abilities (Kundu and Bag, 2012). In regions of the lower Amazon basin, for instance, such a medical pluralism is working (Reeve, 2000); after having made a diagnosis, these local curers have the choice of either referring their patients to a medical physician or prescribing a traditional therapy. Indigenous healthcare systems have often been characterized as flexible and open-minded with regard to new developments (Ingstad, 1990; Andrae-Marobela et al., 2010; Barcan, 2010). Not only should traditional medicine be acknowledged by modern public health (as long as it acts within human rights boundaries), but biomedical healthcare should also have the potential to be integrated in, or be compatible with, indigenous methods. Medical pluralism can be observed in many settings where people's life experiences are in transition and different health concepts coexist.

Individual leadership and responsibility promoted in the Botswana HIV/AIDS campaign. Leading politicians and the village chief serve as role models.
© Fred Krüger

It cannot be denied, however, that the field of complementary medicine conjures up charlatany and profit-making. Indigenous healthcare systems, too, with long-standing traditions and soundly embedded in local settings, sometimes display harmful



practices. And some modern therapeutic measures rely on belief in the way cures are provided, even if their effectiveness is not proven scientifically. Conflicts are apparent between medical cultures in the western world when biomedicine and homeopathy, or the interests of the pharmaceutical industry and political priorities, clash. This should be taken as an incentive to intensify the exchange of experiences and ideas between modern and complementary practitioners. Otherwise markets evolve in an uncontrolled manner and healing practices, which may have harmful effects for the customers, are traded. These markets of healing (not all of them detrimental, of course) are governed less by price than by belief. As these beliefs change to accommodate the choice of therapies and subjectively perceived effects of therapies influence beliefs, the social space of beliefs and the markets of healing are related (Thornton, 2010; van Dijk and Dekker, 2010). It is important to note that not all healing in this market produces health in its strictest sense (van Dijk and Dekker, 2010; see also Mmualefhe, 2007). Sometimes, cure is attributed to placebo effects, an interpretation that has been complemented by much more differentiated explanations in the latest literature in psychoneuroimmunology or anthropology (for instance, Meissner, Kohls and Colloca, 2011; Mommaerts and Devroey, 2012; Ostenfeld-Rosenthal, 2012).

In modern medicine, diseases usually appear as the pure effect of natural determinants; as such, they are countered with an attitude of uncompromising combat. This explains, on the one hand, why modern medicine has become highly effective and, on the other, how life can be lived despite illness or the absence of healing (in the strictest sense of healing as a cure) has shifted out of focus. More recently, public health approaches have begun to overcome these purely modern epistemes. Therapeutic pedagogy, psychopathology and palliative medicine are examples where the logic of the natural sciences has opened up to aspects of life beyond the rationality of maths, chemistry and physics, which, however, continue to control large parts of health-related research and politics. Such rationality is most obvious in the discussion about biosecurity which is increasingly being linked to health systems (see Box 6.5). This discussion has intensified and, with the threat of globally emerging infectious diseases perceived to be increasing, turned into a debate on international human security. Hazard scenarios are taken as a legitimization for prioritizing protection against pathogens rather than developing culturally sensitive public healthcare. New health surveillance technology suggests that the reliability of outbreak predictions has been greatly enhanced, though this may not always be the case; even the relatively foreseeable influenza outbreaks still leave health authorities acting upon scientific uncertainties (Gostin, 2004). The dilemma for public health agents is obvious: “If interventions are well targeted and timed, then public health officials may prevent untold economic and human harm. However, if the interventions over-reach, officials will be accused of disregarding essential economic interests and fundamental human rights” (Gostin, 2004).

BOX 6.5 Global health security? Questioning an ‘emerging diseases worldview’

In April 2014 WHO published alarming results of its first global examination of antimicrobial resistance (AMR). According to the report, AMR is an increasing threat for global public health, “so serious that it threatens the achievements of modern medicine” (WHO, 2014c). Treatment for common infections becomes much more difficult, expensive and in some cases impossible with a growing number of micro-organisms no longer responding to the limited number of known antibiotics. Over the last two decades, health threats related to infectious diseases have received considerable attention and infection control reappeared among the top priorities of global health politics. This is what Nicholas King termed an “emerging diseases worldview” (King, 2002).

Different considerations helped to establish this ‘worldview’.

Facing antimicrobial resistance, rapid mutations of bacteria and unexpected crossings of species boundaries, medical professionals abandoned the modern hope of an ever-increasing mastery over infectious diseases. A new microbiology concedes the evolving nature of bacteria and virus, and their ongoing capacity of resistance and emergence (Cooper, 2006).

At the same time, the growing integration of markets and the global adoption of certain consumption and lifestyle choices are perceived to facilitate the threat of emerging diseases. Global circulation of goods and people may allow for an infectious agent to spread widely while travel times are often shorter than incubation periods. The growing demand for meat increases large-scale livestock farming under conditions where the preventive feeding of antibiotics is a prerequisite or a practice by the farming industry to boost growth and weight for sales. The biological simplification, uniformity and extension of crop and livestock systems lead to their enhanced ‘invisibility’.

And finally, the United States military strategy began to identify health issues as a possible security threat. Facing the threat of bioterrorism, public health became a concern for the Department of Homeland Security and international infection control resurfaced as a security issue. This problem definition was shared internationally and different initiatives of global health security emerged in the early 2000s such as the formation of the Global Health Security Initiative in 2001 or the acceptance of the revised International Health Regulations in 2005.

Those three different strands of argumentation – a growing discourse on mutations and emergence in microbiology, the imagination of an “infectious disease burden of globalization” (Saker et al., 2004) and the securitization of health – are forceful in putting the issue of infection control high on the current agenda of global public health politics.

It is important to understand the selectivity of this emerging diseases worldview. By establishing an outbreak narrative as the centre of global public health, this worldview prescribes a certain structure of urgency. This draws certain health problems and threats to be relevant and tends to neglect a range of equally important global public health concerns (for example, nutrition, maternal mortality reduction, child survival). The ‘threat protection mentality’ established through this rather narrow perspective fits in especially with the self-protection interests of states in the global north and with the military doctrine of human security. Without consensus of the global community, the understanding of global public health changed from being a humanitarian issue to being a domain of security. ‘Global health security’ then

reorients policy priorities and resource allocation. Special attention is given to the strengthening of global disease surveillance and to the development of local capacities for rapid biomedical interventions into novel pathogens. The demand to build up global disease surveillance is not always beneficial as it binds manpower and money into often redundant surveillance networks. High-income nations often become the beneficiaries of the early warning information and the scientific data produced through these surveillance systems while low- and middle-income countries lack the necessary basic health infrastructure or biotech industries to respond adequately to those warnings or information. In lower-income countries, strengthening the health systems first would ultimately be a more efficient way to achieve proper detection and response to outbreaks.

In sum, the emerging diseases worldview is a convincing depiction of current health problems but at the same time a selective approach with questionable political implications. It could be argued that the consequential securitization of global health is strongly biased towards the interests of western nations. Furthermore, the implied orientation towards the discovery of a novel pathogen and the prioritization of surveillance, early warning and emergency responses is leading to the occlusion of underlying more structural factors driving disease emergence. Hunger and the lack of clean water, a growing number of urban poor or the ongoing deterioration of national health systems are challenges that need to be re-centred on the global public health agenda against an emerging diseases worldview. ■

The intimacy of health and the right to a self-determined life

Assessing risks for a particular population is not merely a technical or logistic process. Public health schemes are often based on rationales that prioritize biomedical approaches and efficiency, the latter mostly grounded in economic viability. But questions of health and healing reach deeply into private and very personal experiences in that they touch on intimate – and sometimes relentless – issues of suffering, which can also include the death of relatives and friends as well as the need to confront one's own mortality. This extends into the realm of emotions, mental well-being, beliefs and collective and private assumptions. Here, questions arise (how to live a meaningful life? what comes after death? etc.) that cannot be answered conclusively on a scientific basis alone – philosophical, religious or spiritual explanations are needed. These explanations, when put into practice, form culture. The ways societies deal with people's quest for meaning and the evolving worldviews are essential to social cohesion. Sustainable people-centred healthcare is thus inextricably linked to social justice (Rosenberg, 2014). Justice and the protection of intimacy (which includes the right to self-determination), firmly rooted in cultures, make matters complicated. It is, therefore, a requirement in public health action to:

- perceive culture not merely as a local entity but understand cultures as a mesh of different fields of practice interacting, and sometimes competing, with each other

- acknowledge that public health agencies are engaged in very different cultural framings at different scales (which implies, for instance, contrasting challenges faced by CHWs, who work in local everyday realities of life, on the one hand and requirements for actors who engage in global agenda setting on the other)
- take into account that organizations have their own internal communication and decision cultures, not necessarily compatible to others, and that probably restrict their ability to implement appropriate assistance to truly meet people's choices and needs.

Self-reflective culturally sensitive public health that incorporates these complexities into its actions can make a difference in ensuring that basic healthcare and long-term disaster management, such as tackling the HIV/AIDS pandemic, become more sustainable.

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Putting culture at the centre of risk reduction

Disasters only happen because trigger events (natural hazards) interact with vulnerable people. Hazards are only ‘translated’ into a disaster if there are vulnerable people to be affected by it. For example, the same hurricane can pass over three different countries in the Caribbean and have very different effects in each. The intensity of its impact depends on the vulnerability of the people, including the level of preparedness of the country to deal with it. The idea that disasters are not ‘natural’ but are a product of how human systems make people vulnerable (in different degrees) has long been acknowledged (e.g., Hewitt, 1983; Blaikie et al., 1994; Cannon, 1994; Cardona, 2004; Wisner et al., 2004). People’s vulnerability is largely determined by factors of politics (how well government functions and how power is used to benefit all citizens), economics (how income and assets are distributed and taxes used for preparedness) and society (whether some people are suffering discrimination on gender or ethnic basis). This idea of the ‘social construction’ of disasters means that when a hazard happens, it is not automatic that a disaster follows.

For vulnerability reduction and increased preparedness (what is often called disaster risk reduction or DRR) to succeed, it must overcome the factors that generate vulnerability. Most assessments of disasters accept the role of politics, economics and social factors as a key part of the process. To these, culture must also be added as a very significant and neglected factor that affects disasters. As this report shows, it is difficult to consider disasters outside the context of culture. However, there is little mention of the significance of culture in the work of most DRR and climate change adaptation organizations.

Culture is relevant because it affects how people perceive risk and behave in relation to it. But the hazards that people face have also been a key part of how culture is created and evolves. And organizations also develop cultures – their behaviour in DRR and adaptation can be interpreted as organizational culture. These have internal logics, beliefs and behaviours that also interact (and sometimes clash) with the culture of the people they work with.

The issue of culture matters now more than ever, as both hazards and vulnerability are affected by climate change. The resulting stresses in social, physical and economic systems are shifting the world into a new era of risk. To prepare the most effective responses to these changes, it is necessary to recognize the underlying causes of risk. This cannot be done without considering the central role played by culture.

The small island states of the Pacific are among the regions most vulnerable to the impacts of climate change. In Samoa, rising sea levels and storms affect the country’s fragile agricultural sector. The Samoa Red Cross Society runs a vegetable garden project to teach communities agriculture best practices. They also provide seeds, fertilizer and plants.

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Culture is of crucial important for three reasons:

- People's beliefs (and how people behave in relation to hazards because of those beliefs) can often act as an obstacle to disaster risk reduction.
- Local people's culture can support DRR and adaptation, but this opportunity is often missed because culture is not regarded as important by the organizations concerned.
- For most people culture is an integral part of everyday life, embedded in their resource use and interactions with each other, and tied into the power relations that determine a great deal of their existence and their vulnerability.

Disaster risk reduction involves many actors at several stages, from preparedness through to reconstruction. At every stage there are different perceptions of what is taking place, in particular by the people affected and by the organizations that get involved. Interventions after disasters have often been criticized for not taking account of local contexts, especially including the affected people's culture. This chapter highlights how culture can pose a challenge in dealing with natural hazards, but also how it can sometimes support DRR. It provides guidance on how culture should be incorporated in disaster preparedness and mitigation, especially because of the increasingly uncertain future due to climate change.

Climate change is a crucial driver of both hazards and vulnerability. Adaptation to climate change must therefore integrate much more with disaster risk reduction. There is a close relationship between these two domains (Mercer, 2010; Schipper, 2009; Schipper and Pelling, 2006; Thomalla et al., 2006). There are important differences between the way they operate, their goals and the relevant actors. But this report argues that culture is as relevant to adaptation as it is to DRR, because both involve people's perceptions of risk and the behaviour that follows from that. For this reason, this chapter presents conclusions and recommendations to support progress in both disaster risk reduction and adaptation to climate change.

This chapter aims to show how cultures of people and organizations can be more fully included in DRR and adaptation so that the two processes can be better integrated. It also emphasizes the need for DRR and adaptation organizations to:

- Assess which aspects of beliefs and behaviours in relation to risk can be worked with
- Understand what aspects of culture may need to be transformed before DRR and adaptation can be effective
- Identify the compromises needed to achieve this.

The chapter draws on the analysis in Chapters 3 and 4 of organizational culture to see how organizations' own 'internal' beliefs and behaviours can change their support for DRR and adaptation to climate change. If culture is understood, and there is better integration of DRR with adaptation, the result can be increased resilience: an increased ability of people and human systems to deal with extreme events and climate trends.

Beliefs, behaviours and the culture of risk

Cultures often incorporate religious and other beliefs that are partly 'invented' to enable people to live with risk, as can be seen in the examples taken from very different societies around the world. Spiritual beliefs have existed for thousands of years, and emerged among societies that were at the mercy of natural hazards for which there were no scientific explanations. It would, therefore, be very surprising if those beliefs did not have something significant to say about disasters. Many people have beliefs in spirits who intervene for them with the gods, or they accept that god or gods can punish them. Others believe that there is little they can or should do about preparing for disasters, even when they are living and working in a hazardous place. To some, hazards are not something to be feared but to be welcomed, as a sign of a higher power. These are aspects of culture that allow people to 'distance' themselves from risk: people attribute the causes to supernatural beings, that they are being punished, or accept that extreme events are exceptional and beyond control. This distancing process enables people to live with danger and have some control over it by at least having an explanation.

This cultural process of 'distancing' may also reflect deeper psychological processes. For example, psychology experiments in the United States (reported by Herbert, 2011) tested people's perception of risk through 'mental maps' (their imagined geographical position in relation to their daily lives and associated risks). People were asked to imagine living in a home with the possibility of an earthquake happening 200 miles (320 kilometres) away. A disproportionate number of respondents thought that the danger would be much higher when the earthquake happened in the same state as them, rather than at the same distance but across a state boundary. This 'border bias', as the researchers called it, seems inconsistent (some would say 'irrational'), but that is what has to be taken into account. The organizational culture that ignores such behaviour is itself 'irrational' for not accepting it as being real and meaningful to the people concerned.

When people believe that disasters are a punishment, it does not always prevent them from actually supporting disaster preparedness. However, people's response to any DRR initiative is likely to be much greater when their own beliefs are acknowledged and not ignored. One example is a DIPECHO (the European

Commission's disaster preparedness programme) project in Makwanpur village in Nepal, located in the lowlands and very prone to frequent flash floods. Before the project the people believed that the floods were sent by god and there was nothing that the community could do. The project showed that they could do quite a lot themselves to reduce flood impacts, such as making dams with sandbags and local bamboo. The impact of the flash floods was significantly reduced and others villages followed the example (ECHO, undated). Similarly, Dekens (2007) argues that "[T]he perceived fatalism of the rural poor in the Himalayas in accepting natural hazards as the 'will of God' cannot be understood simply as equivalent to the western connotation of fatalism, which is associated with passivity and apathy." Schmuck (2000) has a comparable analysis of 'fatalism' for Bangladesh floods:

"In the view of aid agencies, this [fatalism] perception and explanation hampers both external as well as indigenous efforts to survive disasters. However, the findings of my research on local perception and strategies to cope with floods reveal this conception to be a healthy reaction, a self-help strategy to overcome crises as quickly as possible and return to daily life. As Allah has given the floods, He will also give believers the strength to survive them. The religious explanation prevents those affected literally wasting time and energy asking why disasters happen to them and not to others."

This suggests that DRR organizations must ensure that they are not making their own 'outsider' assumptions about fatalism, because the people's meaning may be very different. Deken cites Hutton and Haque (2003): "[T]he perceived powerlessness among the poor reflects not resignation and passivity but a realistic perception of their position vis-à-vis dominant resource relationships." Assuming that people are 'fatalistic' will misjudge what they are actually willing to do. The people's own beliefs and interpretation of 'fatalism' must be properly understood and incorporated into the DRR intervention. Most people are uncomfortable with uncertainty and the unknown. Many may find it preferable to think that they were punished by god than for a disaster to have no meaning whatsoever. For example, those who experienced extreme hardship after Hurricane Katrina hit the southern United States in 2005 were more likely to describe it as an act of god (Stephens et al., 2012), suggesting that people want a reason for their suffering.

For outside support to work, the DRR organization must acknowledge beliefs and not regard them as irrelevant or irrational: they must be 'worked with' and taken into account. But for organizations engaged in DRR and adaptation, their own culture can make this difficult. They mostly operate on the basis of a scientific and 'logical', 'rational' approach that finds it difficult to allow for different beliefs. What would a DRR programme look like that allowed for people to blame god(s) for their suffering or that shared their fatalism? It is normally difficult for organizations to accept that people apply different logics and rationalities that arise out of their daily practice

of living in dangerous places. The stark difference in risk priorities examined in Chapter 3 shows the significant clash between the two cultures, the problem that the culture of DRR organizations makes it very difficult for them to accept that many people who live in grave danger from hazards do not give those hazards first priority.

Culture does evolve and it is possible for new ideas to be absorbed into existing narratives and practices, or for people to adopt entirely new beliefs. For example, the major religions have all spread around the world and ‘converted’ billions of people, or have merged with existing beliefs (to become ‘syncretic’). So cultures are not rigid and unchanging, and this provides opportunities for organizations to bring about change as well. Cultures also change and evolve within themselves, as they come up with creative ideas or respond to internal dynamics, external incentives and challenges. The example of how mobile phone warnings of storms on Lake Victoria are able to transform local cultures illustrates this process of change under external influence, but using a technology that is already widely accepted by most Africans (see Box 7.1). Some of the cultural barriers to taking safety precautions against storms were reduced through the use of mobile phone texts to provide storm warnings.

Opportunities for compromise also exist, proving that it is possible to work with people’s beliefs to bring greater safety, as in the case of Tuvalu (a Pacific island state) and the use of information about climate change that does not deny religious perspectives (see Box 7.2). This example shows how it was possible to work with local religious beliefs, which were generally unreceptive to the idea that climate change is causing sea-level rise. Without having to change their beliefs, people’s concerns about hazards came to be integrated into preparedness for storms and sea-level rise.

BOX 7.1 Lake Victoria storm warning system – blending technology with culture

Lake Victoria is shared between Kenya, Tanzania and Uganda. It is the second largest freshwater lake in the world and is the source of the Nile. It is also vital to more than 200,000 fisherfolk, tourist and ferry businesses each day, with 3.5 million people depending on the lake for their livelihoods. At any one time there are likely to be more than 100,000 people on the lake. But it is far from safe: because of its local climate, severe storms can suddenly spring up and catch people unawares. This hazard is related to the lake’s moisture and the heat of the tropical conditions interacting with the surrounding hills and mountains (Barnett, 2013). No proper figures are available for the number of incidents in which people drown because wind and large waves capsize or destroy their boats. But all the relevant agencies consider that it is appropriate to assume that between 3,000 and 5,000 people die each year. As has been seen in Chapter 3, all over the world people are willing to exchange the risk of hazards in order to gain their livelihoods. Even though they live with this dangerous lake, fishermen do not learn to swim and do not

take life jackets in their canoes. Some do not like using them as they take up space in the boat that can be used for fish. Others are quoted as saying that the life jackets are too expensive. What price is a life? Yet many people do not use seat belts that are provided free (see Box 1.1).

So where does culture play a role? Some consider the risk to be part of the job and appear to accept death, if that is what it takes, to support their own and their family's life. It has also been suggested there is a gender factor and that men may dislike learning to swim or using safety equipment. How could such behaviour be changed to save more lives? Even a warning system will not work if it is not going to change how people think about and behave in response to the risk. A rescue organization, Safe Waters Foundation Africa, formerly known as the National Lake Rescue Initiative (NLRI), was part of an initiative to provide a warning system for the lake with the Uganda Department of Meteorology, the World Meteorological Organization (WMO), the United Kingdom's Met Office, the Grameen Foundation, MTN Group (an African-based mobile telecommunications company) and the mobile phone company Ericsson. Can a technological approach help to solve what might be a cultural barrier? What would make people interested in a warning system when they have been reluctant to take other safety measures?

The Mobile Weather Alert service began with a pilot project in 2011 working from Uganda. Using a simple traffic light system, fishermen and -women who join the service receive a text message to say if the conditions are green through to red, which means 'take action' to avoid predicted winds more than 37 km per hour or severe thunderstorms. One point is whether the traffic light approach has much meaning for the people: hardly any of them are likely to have ever seen a traffic light. Does this indicate a problem of the organizational culture making assumptions about what symbols are meaningful for other people? The messages are also written, not in colour, and so rely on recipients being literate and understanding that when they see RED in the words, it has a particular significance. Even so, more than 1,000 men signed up for the pilot, and its first success was claimed a few weeks later when an alert enabled people to avoid a windstorm. The goal is to have every fisherman and -woman included in the scheme from all three countries.

One of the reasons that uptake is likely to be good is because of the widespread popularity of mobile phones in these countries. It has become a mark of normality to have a phone and to use it for a variety of needs that go beyond simply talking to family and friends. It can be a vital tool for livelihoods and other activities. Its wide 'cultural' acceptance may be part of the key to why it can also transform the risk culture of the lake users. Because all the fishermen receive the same message, it does not make them appear to be 'weak' to realize that they can all take action together to avoid danger. They can decide not to go out on the lake or, if they have one, take a life jacket. Peer pressure now operates in a reverse direction: those who do not heed the warning might be considered the foolish ones. The men now have a good reason to behave in a safe way without having to give up their self-esteem and identity.

From the start, the project acknowledged that the approach could not be simply led by technology and required working from many angles, with an appreciation of local culture and the links with the local people that the NLRI had already established. What it may have discovered is a way to marry local culture to modern technology to enable the combination to overcome some of the cultural barriers to disaster preparedness. A few boat users who own life jackets are now apparently willing

to take them out when a danger is forecast. Whether there is any willingness to learn to swim is another issue. Ugandans are regarded as “having a profound fear of water... even among the fishing communities”. There is a need to counter “[t]he fatalistic boating culture currently active in Uganda [which] is an inherent trait” (NLRI).

The next stage is to ensure that the approach will be working across the lake and serve users from all three countries. This is intended to be achieved through a more comprehensive ‘nowcasting’ service that gives weather information in real time. WMO is working with the meteorological services of all three countries to improve forecasting of severe weather events over the lake. Some of the scientists involved think that climate change may increase the storm risks on the lake, and so the need for it will increase. ■

BOX 7.2 Mixing science and belief: how climate change became an acceptable topic in Tuvalu

At its highest point, Tuvalu (a small island state) rises just three metres out of the Pacific. The isolated coral atolls that are home to 11,000 people are among the world’s most vulnerable to the impacts of climate change. Rising sea levels and storms affect the country’s fragile agricultural sector while the intensification of El Niño and La Niña weather patterns have caused major water supply problems, as Tuvalu is reliant on rainfall. In 2011, a particularly intense La Niña weather pattern caused a protracted drought. All the main atolls ran out of drinking water. Rising sea levels, salt-water intrusion, coastal erosion, the loss of arable land and more frequent tidal surges penetrating deep into Funafuti atoll (the main island) give rise to growing concern about the impacts of climate change.

A substantial proportion of the population did not believe that climate change, in particular sea-level rise, was occurring. Tuvalu is a very religious society and almost everyone attends church regularly. Opposition to the idea of climate change derived in part from a belief that the biblical flood would not recur because of a promise made by God to Noah that it would not happen again (a view that is shared by some senior politicians and many people in the United States). There was widespread questioning of both the visible impacts of climate change and the measures proposed to raise awareness and address them. The Tuvalu Red Cross Society has supported adaptation and DRR programmes as well as tackling widely held disbelief in climate change and has helped to find a way to combine the climate science with religious beliefs.

One event where this can be fostered is the annual King Tides Festival, an event that marks high tides when seawater bubbles up through the porous coral atoll and floods one-third of Funafuti. The festival highlights the vulnerability of Tuvalu to climate change and rising sea levels. These have badly damaged the island’s agriculture with giant taro, breadfruit, coconut, banana and sweet potato plantings all suffering from drought and salt-water intrusion into the water supply. Awareness-raising through the festival has focused on longer-term food security, promoting health and hygiene, and water conservation.

Recent crises, including a state of emergency during a sustained drought in 2011 when Funafuti ran out of drinking water, led the Tuvalu Red Cross in association with the Tuvalu Council of Churches to promote discussion about climate change. Church organizations were invited for a one-day workshop to discuss the impact of climate change in the middle of the drought response. It brought together all the religious

groups on the island: Tuvalu Church, Seventh Day Adventists, Brethren, Assemblies of God, Mormons, Jehovah's Witnesses and members of the country's small Muslim and Baha'i populations.

Realizing the importance of this event, many government representatives also attended, including people from the Pacific Adaptation to Climate Change Project, the Environment Department, the National Communications Project (which provides Tuvalu's reports to the Intergovernmental Panel on Climate Change), the Tuvalu Christian Church Climate Change Program and the Tuvalu Red Cross Climate Change Program. Each organization was asked to present their work, observations and areas of expertise to the group.

Despite the emergency, all took time to consider the wider issues that contributed to the drought and discuss the scientific, theological and humanitarian aspects of their experience of it. Given the intensity of the crisis and the response, and the sense of common humanitarian purpose, it was, paradoxically, an ideal time to bring up complex questions and develop a consensus. The churches broadly agreed that the drought and climate change were not 'God's doing' and they agreed to support scientists and humanitarian and development workers. It was also agreed that risk reduction, awareness-raising and adaptation activities did not undermine core religious principles. Unlike in some other parts of the Pacific, notably Kiribati, climate change is now discussed in different terms with broad agreement on the importance of humanitarian work instead of the distracting theological debates of the past.

Two key factors helped people to change attitudes. The first was that people are becoming aware of what happens when disasters actually strike, rather than simply passing on information about climate change out of context. This was stressed by the secretary general of the Tuvalu Red Cross, using the example of past tsunami warnings. People often did not take much notice. But after the Samoan tsunami in 2009, there was another warning for Tuvalu and now people had a better idea what it could do. The second factor was the theological debates which accepted that biblical belief was not incompatible with taking action to deal with observable risks. Evidence was presented that sea-level rise and global warming were caused by greenhouse gasses. It was accepted that they are man-made problems and not punishment for sin. Importantly, there was an appeal to the traditions of *fenua* (a combination of land, family and culture) which emphasized the importance of the preservation of identity linked to place in the face of climate change.

In seeking to change minds and traditional beliefs about an important issue, the Tuvalu Red Cross Society adopted an effective long-term strategy based on increasing resources, influence, trust and legitimacy as a disaster responder and building coalitions with other climate change actors. Participation in regular climate change events and building individual relationships were also vital. This enabled the Tuvalu Red Cross to seize the moment of a national emergency, when parties were most receptive to new ideas, to build consensus and help solve practical problems so as to change the terms of the climate change debate. ■

Culture and risk at the grass roots

Cultural aspects of many people's attitude to risk appear to be related to two types of behaviour. At first glance these appear to be in contradiction, since one reflects spiritual aspects and the other the more material aspects (though there is interaction between them). The first is related to non-material benefits of risk-facing behaviour and the second is linked to how economic activities are given priority over risk and are enabled by beliefs.

The first – behaviours that appear to have little material benefit – are inherently related to producing a satisfying emotional state rather than a material benefit. Religious and other beliefs can increase people's emotional stability by giving them self-esteem, better social capital, stronger bonds with kin, neighbours and (where relevant) ethnic group, and so on. There are many examples that show how people may prefer these as benefits rather than improvements to material well-being. It is emotionally satisfying for people to make considerable effort to engage in costly and time-consuming cultural practices that appear to outsiders to be non-rational. In these situations many people believe that the 'investment' of their resources will be returned through the non-material benefits of increased esteem and social capital. These, of course, can produce material benefits at a later date and could be considered a type of insurance, in which the insurance premium is paid without knowing if the payer will need the benefit of the pay-out.

Such 'investments' do not only include offerings and prayer. Relatively poor people in *favelas* in Brazilian cities will spend an enormous amount of time and money to be part of a samba club for the carnival rather than invest in disaster preparedness for their home and neighbourhood. With limited resources, people's investment goes into what makes more 'immediate' sense, activities that distract from daily hardship and despair. Other collective but costly rituals may bring benefits a lot later, but can provide hope and comfort in the present. Ghana is famous for its extravagant funerals (with very elaborate coffins) and associated parties that can cost tens of thousands of dollars – far more money than would be spent on healthcare for the deceased before they died. It even happens in New York with the Ghanaians who live there (Dolnick, 2011). Other Americans and Europeans spend similar amounts of money (even when not particularly well-off) on the ritual of marriage – the average in the United Kingdom is currently estimated at more than US\$ 30,000.

The second type of risk-facing behaviour is related to material well-being. It involves the emergence of cultures that enable people to fulfil their livelihoods in dangerous places and to give a lower priority to extreme hazards in comparison

with everyday needs (see Chapter 3). People live with cultural explanations of risk that enable them to live with danger so that they can pursue their livelihoods and earn a living even when at risk. Culture often has embedded in it, therefore, processes that provide emotional comfort – ways of perceiving and responding to risks, including rituals, that can ‘discount’ the actual dangers of the hazards with which people live.

Disaster managers often wonder why, even with information about an imminent hazard, not all people act to minimize the impact of the hazard. A crucial explanation for this apparent inaction is that not everyone views risks in the same way. Chapter 2 argues that DRR and adaptation organizations need to be aware of the different ways people view the world in order to be able to reach those who seem to ignore the risk of disaster. While some of these worldviews enhance the capability to deal with (potential) threats, others result in behaviour, attitudes and understandings of reality that increase the people’s vulnerability to natural hazards. In order to reduce risk effectively, therefore, organizations need to understand how to communicate and act in a way that takes account of these perspectives.

Culture helps to give meaning to people’s economic existence, enabling them to relate to risks in ways that acknowledge values and ideas of what is important to them in all aspects of their lives. However, power relations are embedded in some cultures and lead to different allocations of risk. One of the most significant of these relates to gender, where females generally are worse off in access to resources, nutrition and healthcare, and are more likely to be subjected to violence. The other main type of cultures with integral power relations are those with formal or semi-institutional limits on the type of livelihood that someone can do. This is most obvious in systems with caste restrictions or those in which livelihoods (often based on craft skills) are passed on down generations. In other cultures people may have a sense of their place in the social hierarchy, with self-restricting ideas on what someone believes they are entitled to do. This can be related to religions that involve concepts of reincarnation, where a person’s status (and sometimes livelihood) is determined by behaviour in their previous life. The low status groups may accept (or be expected to accept) their own oppression and exploitation (as in caste systems or pre-modern European feudal hierarchies) that codifies status through culture. It is extremely difficult to deal with such situations in DRR and adaptation, as higher-status groups may object to help being given to those with lower status. This is one key area that affects hundreds of millions of people for which there is no easy answer. In such situations, it is crucial to be aware of the restrictions that may be put on successful DRR interventions, including in relief and reconstruction.

A summary of the types of effects that culture can have includes:

- Some aspects of a culture can be considered to be a barrier to more effective DRR and adaptation.
- DRR organizations need to understand this in order to assess how they can (or cannot) influence it to reduce the negative effect it has.
- Other parts of people's culture may be considered supportive of improved DRR and adaptation (for example, the readoption of vernacular building techniques after the 2005 Kashmir earthquake – see Chapter 5).
- Some beliefs are linked to power relations and this is a key reason that culture is a barrier to reducing vulnerability. For instance, some cultures involve a belief that:
 - Particular people 'deserve' to be in a vulnerable position (e.g., low caste groups, some ethnic minorities)
 - Some people have a lower priority in being protected or provided with aid (e.g., in some cultures this can apply to females)
 - Females deserve less nutrition and access to healthcare and resources generally, such that they are likely to be more vulnerable to hazards and have less access to relief.
- In many cases, people's understanding of their social and natural environment enables them to live with risk by making emotional or spiritual adjustments to danger, but do not provide a real reduction in vulnerability.
- Dealing with such interpretations is difficult because the local people may think that the DRR organization that wants to reduce danger is interfering in their culture.

To assist organizations in developing knowledge of and cultural sensitivity towards people's culture, a matrix for use in discussion, research and workshops has been designed (see Table 7.1). Using this approach, it may be possible to identify the ways that beliefs and behaviours around risk can be acknowledged, transformed or overcome. The idea of using the table is that a DRR or adaptation organization can take account of the different aspects of culture through existing research and participatory exercises (e.g., using Vulnerability and Capacity Assessments) so that it is more apparent how the outside intervention may be received by the local people.

TABLE 7.1 What different actors might do differently to incorporate the culture of the people involved in their work

What are local people's perceptions of risk? Are serious hazards treated differently and separately from everyday problems and risks?	What are their attitudes to risk? Do local people think of serious hazards as something they can work on, or are they fatalistic or believe disasters are punishment?	What are the underlying beliefs (for example, a particular religion)? Do these beliefs make it difficult to introduce DRR and adaptation?	How do the people engage in everyday living/livelihoods and priorities? Do their livelihoods involve them in living in dangerous places?	How do the people behave in relation to hazards? How do their beliefs and livelihoods lead them to take certain actions and not do other things in relation to hazards?
<p>Summary of the local people's culture in relation to risk and local hazards</p>				
<p>Under each heading in the boxes above, the local people's culture can be summarized as a guide to action in DRR and adaptation. The boxes should be filled in after research on the local areas where work will be carried out, using participatory approaches with the people to assess their own definition of their culture.</p>				
<p>Below is a list of different actors that may be involved in DRR and adaptation:</p> <p style="text-align: center;">What does each actor need to do next in relation to <i>people's culture</i>? How do they each think their actions need to change to take account of the people's culture? Each organization enters into the boxes below its response to the boxes above, showing how it needs to take account of each aspect of the people's culture</p>				
Central government				
Local government				
Red Cross Red Crescent National Society				
Red Cross Red Crescent branches and volunteers				
National NGO				
International NGO				
Schools				
Universities				
Insurance companies				
Private sector, e.g., hydropower sector				
Others				

Source: Terry Cannon.

Culture and the understandings and behaviours of organizations

Organizations must reflect on their own way of doing things and their own internal culture, and how they interact with the culture of the people they intend to support. Self-analysis can help organizations change their own culture so that it is more effective and has greater sympathy for that of the people. The key issues that have come up in this report include looking at the organization's culture:

- In relation to risk priorities: accepting and working with the fact that the people concerned often have a different hierarchy of risks
- In relation to use of the 'community' concept: not assuming that there is internal unity among people in the location where the work is to be carried out
- Avoiding the assumption that people share the same logic and 'rationality' as the organization
- Acknowledging (and where possible working with) people's beliefs that do not fit with the organization's own logic.



A shop in Gaborone, Botswana, selling *muti* (traditional medicine) and, by its own account, culture.
© Klaus Geiselhart

TABLE 7.2 What different actors might do differently to change their own organizational culture

Self-diagnosis of the organization's own culture

For each of these components of culture, what do each of the actors need to do for them to acknowledge and understand their own *organizational culture* (including power relations) and to transform that so that it fits better with *people's culture*?

What organizations themselves need to do next in relation to their own <i>organizational culture</i>	Perceptions of risk	Attitudes to risk	Underlying belief	Everyday living/livelihoods and priorities	Behaviours in relation to hazards
	What hazards does the organization consider important and want to prioritize in its work? Why have the risks been identified and chosen for intervention?	Does the organization consider that technical interventions are valid for disaster preparedness or adaptation? How does the organization deal with the causes of vulnerability? Is the organization driven by funding for disasters or prepared to take account of all risks that people face?	Is the organization guided by particular faith in, for example, the value of 'community' as a place of intervention? Does it have faith in technology as a solution?	How does the organization consider the livelihoods of the local people in relation to risk? Does the organization believe in interventions that may deny or reduce people's access to their livelihoods?	Does the organization act only in emergency relief and reconstruction or also in preparedness and prevention? If it engages in preparedness and prevention, can it combine work on serious hazards with the risks that the local people identify?

Central government

Local government

Red Cross Red Crescent National Society

Red Cross Red Crescent branches and volunteers

National NGO

International NGO

People – i.e., how can ordinary people be mobilized to influence DRR and climate change adaptation agencies' organizational culture to be more effective?

Insurance companies

Other relevant private sector

Others

Source: Terry Cannon.

Keeping in mind the two complex grass-roots dimensions of risk-related cultures and action (see above), it comes as no surprise that it is difficult to incorporate a clear concept of 'culture' in the interventions that organizations make. But there are some positive things to build on. In many cases organizations already have some realization of cultural factors and of the divergent perceptions. The issue is how to make it more prominent and a much more central part of what is being carried out. Table 7.2 gives a matrix that can be used by organizations to challenge and test their own culture, beliefs and behaviours. The idea is that any organization that is going to conduct DRR or adaptation activities examines its own culture and assesses how that culture will affect its work.

Many organizations have incorporated measures to include local, grass-roots perceptions and priorities in their work. And in many instances the local participants in DRR and adaptation projects are able to work with the organization without losing their dignity, faith or collective and individual identities. They do this because they realize that there are other logics and understandings (and constraints) that they can accept so long as they can see that their own beliefs are taken seriously (see, for example, Boxes 7.1 and 7.2) and not undermined and disparaged.

In other cases, the local cultures are recognized but not fully accounted for in DRR work. This may seem very understandable in post-disaster emergencies, when the initial focus is entirely on saving lives. But Chapter 5 shows how problems can arise when local culture is not incorporated into reconstruction, and how it can provide benefits when it is respected and integrated with outside assistance. In pre-disaster activities lack of cultural awareness may be due to lack of time and insufficient resources, especially when projects have to meet targets within just a few years. In other cases it may seem too complicated (or not worthwhile) to incorporate cultural factors into the design and implementation of DRR-related projects. Or it might be too 'risky' as it would require challenging existing power relations that cause vulnerability, whether at the national or the local scale.

This is another key aspect of the culture of organizations: it is often difficult to assess the causes of vulnerability. Will the government perceive it as interference? Will doing this cause trouble with local power systems? Will it be difficult for donors to support it if they do not want to get involved in local power and politics? Organizations have developed cultures that enable them to avoid looking at the real causes of problems. Chapter 4 identifies the use of the concept 'community' as one of the key beliefs in this culture. There is a significant danger that organizations end up in a cosy relationship with their partners and donors that enables community-based and participatory activities to operate in a ritualized way.

In many organizations, volunteers and staff who work with the local people are often aware of the beliefs, decisions, needs and priorities on which these people's livelihood activities are based. But often they do not know what to do with this knowledge: the organization's own logic and priorities do not accommodate different beliefs or priorities. The grass-roots knowledge fades or is lost completely at higher levels of the organization's administration, where decisions are made within the organization's own 'culture', involving financial, logistical and donor constraints. This is made more complicated in the DRR and adaptation 'sectors', where there is competition between 'rival' agencies. Also, having to fit in with donor priorities restricts the organization's scope to modify their beliefs and behaviour. It makes it even more difficult for insights about people's own beliefs to be communicated to higher levels of decision-making.

Finally, some organizations may be unwilling to take account of local people's other cultural framings: of what is important to sustain livelihoods, what is 'risky' or what actually constitutes a disaster. This stems from a conviction that the intervening organization's idea of what needs to be done is the 'right' one, that there are no other valid interpretations of risk or that enough evidence exists to show that programmes and schemes that have worked before will work again.

To support the improvement of this inclusion of culture into DRR and adaptation work, these general points of guidance and questions are suggested:

- *Understand the culture* of the people the organization is going to work with. This can take time, and may be very difficult in disaster response, but is more feasible in disaster preparedness. Be aware that it is still easy to misunderstand and, where translation is involved, it can be even more difficult. What is understood as 'national culture' and assumed to be pervasive in the country is unlikely to be valid: differences can be significant at the local level and even between places that are close to each other.
- *Translation is culture*: translation is difficult even with people in the same country who think they speak the same language, because dialects and concepts can vary a lot. Also many of the terms and ideas used in DRR and climate change originate in English and are difficult to translate: this is a cultural, not just a technical translation issue.
- *Acknowledge people's beliefs* and realize that to be effective these have to be understood and recognized as the basis for what the organization wants to do. What scope is there to assess the different perceptions of risk to see if existing local beliefs and those of the external organizations can be integrated so that the extreme hazard can be prepared for?

- *It is not always possible to respect some beliefs:* many from outside the cultures that practise them will not accept behaviours like female genital mutilation, arranged marriages, child marriage and so on. But note also that the people may have little respect for some of the beliefs of the outsiders who come to work with them. The key issue will be: to what extent do behaviours that are difficult to accept act as a barrier to effective DRR and adaptation?
- *Respect emotions:* in working with risk, emotions are a primary factor that affects how people behave in relation to risk perception and in response to risk (and, therefore, willingness or not to do what the outside organization proposes that they should do).
- *Understanding the clash of priorities:* is the hazard that the DRR organization is concerned about also something that worries the local people? How does the hazard area support people's livelihoods? Is there any scope to change people's priorities to deal with hazards and, if so, can that be done while respecting the livelihoods? Do the proposed DRR or adaptation interventions involve reducing access to assets used in livelihoods (e.g., through removing people from flood plains) and how will people react to that?
- *Recognize diversity:* not everyone who belongs to a religion will follow its doctrines completely and not everyone belonging to a religion acts the same.
- *Acknowledging that local skills and knowledge* that may be linked to local culture can enhance DRR practices and that recognition of these aspects of culture can improve skills over a wider area.
- *What beliefs do people have about their risks* – the hazards of that location and their place in relation to it? For many people, there will be overlap between many of these points and in practice the strict doctrines of a religion may be subverted by local cultural or more general psychological and emotional attitudes to risks:
 - What is the cultural background of local beliefs and how far can they be incorporated with the viewpoint of the organization?
 - Are these beliefs invoked to help the people to deal with the risks? For example, do they embody the risk in a religious or symbolic way so that people can externalize it and enable them to have some control over the risk, e.g., by making offerings or prayers?
 - Are the people's beliefs independent of the local hazard or integrated with it? For example, are local beliefs part of a religious framing of life that exists outside of specific risks like earthquakes or floods? Or do the religious beliefs relate strongly to the risks that people experience in those locations?

- Are there any relevant non-religious ‘cultural’ or psychological attitudes to risk, including fatalism, ‘it will not happen to me’ or ‘I will get help if it happens to me’, that lead people to behave as if they do not need to take precautions?
- *Is the organization aware of what people would have to give up in terms of the wider benefits of their beliefs (such as peer group approval, economic benefits, networks of trust, etc.) if they were to embrace the external ‘scientific’ approach? Under what conditions might people be willing and able to make that transition?*
- *What are the time frames involved with different hazards? How urgent is it to work with people on serious risks by comparison with their everyday needs? Is the organization aware of how the people might respond if their priorities were dealt with before or in parallel with preparedness for the extreme hazard?*
- *Where does the post-disaster humanitarian process and its actors link up to all this? In relief and recovery, are cultural attitudes and beliefs ignored because they are considered irrelevant to the life-saving and recovery process? What does relief and recovery do to undermine, retain or modify local cultures?*

Many organizations fail to reflect on the fact that they have their own culture, and that part of that culture is how they deal with the power relations affecting the people they intend to support. The first issue that often gets played down is understanding that people’s poverty, and their vulnerability to hazards, is a result of the way that power systems operate. Is it possible to reduce vulnerability and achieve adaptation without any significant changes to power? Because the answer is often no, or only partially possible, the organizations concerned tend to evolve a culture that enables them to avoid dealing with the reality that they may not be very effective.

One of the most important issues to be understood in any location is the power systems that affect the location and people living there. This is especially important in rural areas where power affects use and ownership of the assets and resources that people use for livelihoods. Can the power systems (for example, land tenure and gender) be avoided? The report has explored some cases (e.g., cyclone shelters in Bangladesh) where it is possible to achieve some preparedness activities that do not challenge power and, therefore, enable some vulnerability reduction to happen. But is this possible for all aspects of vulnerability?

Many organizations have also adopted a culture of community as an organizational concept for framing their work. Using community in this way reinforces the notion that power relations are not so significant at the local level. It is a culture that can also distract organizations from assessing what ‘communities’ cannot achieve because the local scale is too small for risk reduction and the relevant hazards are affected by other processes happening at larger scales.

The organizational behaviour becomes an approach to people and localities that involves a type of collusion in which organizations, their local partners and the funding agency ‘silently’ agree that they will leave power systems undisturbed, accept that community is a valid concept and largely ignore the local people’s own priorities in order to promote the specific issues for which they have received funding. The report’s editors asked DRR colleagues and friends why it is so difficult and rare for DRR organizations to acknowledge the key power relations that affect the localities where they want to work. The response here from a very well-informed Bangladeshi who has worked in both DRR and adaptation activities for a major international non-governmental organization (NGO) was typical:

“I think there is an unwritten consensus between [international] NGO and their local partner not to talk about it. You have seen that most of the NGO-led adaptation projects are only for three to five years. Within this limited time frame, it is quite impossible to address power relations. I feel that they want to address it; they have to spend a substantial time building rapport with the community. But in reality, they do not have that much of time in their project. They select a local partner and the funding agency asks them to begin the implementation, which means spend money. The donor wants visibility and needs to burn money. They are not interested who is getting what and how. If they have good visibility for their work and high burning rate [i.e., spend the whole budget in time], this can ensure their next projects; power relations are not required. This is another type of power relation at macro level between donor and recipient of the funding.”

Another Bangladeshi NGO worker confirmed this: “I used to work with a major [international] NGO for two years. I also found projects are mostly about some short-term solutions or spending money in a way where there can be lots of visibility. It does not address power issues and go in-depth of the problem. It is very outcome-driven practice.” Do some organizations manage this problem better than others? Are these exceptional because of special circumstances in Bangladesh or widespread around the world? Anecdotal evidence suggests that it is common, but such frank acceptance rarely finds its way into project reports or evaluations, since all the parties to the process have an interest in avoiding facing up to it.

This is not to imply that the organizations do not have good motives. But almost every reader will surely be aware of an organization that has applied for funding to give them resources for the future and to maintain jobs, but not necessarily for activities that they would do if they followed their goals. It is not that the organizations tied into this culture are malevolent or hypocritical (see below). It is a culture and, as such, has evolved through a complex acceptance of principles (to

support poor and vulnerable people), concepts (community and participation) and faith in which each of the parties mutually reinforces the beliefs of the other.

Local-level and community-based work is not the only way to support people. In many parts of the world, the most effective way to reduce poverty (and thereby in many cases to reduce vulnerability to natural hazards) is to provide good levels of social services. This includes public health and education, and is achieved through income redistribution to improve people's livelihoods (enabling good nutrition) and general well-being. This, of course, requires the correct policies, with efficient taxation and redistribution, and a recognition of 'alternative' interpretations of risk and well-being (see Chapter 6). These are all a result of top-down policies, and were largely the basis for 'development' in most high-income countries, where health services, social security and fairer income distribution emerged during the 20th century. In the past 30 or 40 years, 'development' has tended to be a substitute for failures of governments and markets to carry out such top-down policies. So the problem with top-down does not seem to be a result of the direction (from the top down) of the policy, but the fact that governments are unable or unwilling to carry them out, interest groups sabotage good intentions (for private gain) or markets subvert the operation of the policies (for corporate gain).

The question then is: can it ever be possible for bottom-up attempts to be sufficient in filling the gaps left by government and the market? There is an easy answer to this question: no matter how many organizations are working at grass-roots level, it is impossible to be 'community-based' in every single community on earth. All people and all households, in every village and neighbourhood in the world, will have to adapt to climate change. It is, therefore, logically impossible for organizations such as the Red Cross Red Crescent and NGOs to achieve this through community-based activities. So they must also be involved in designing policies that are effective on a top-down basis. Mansuri and Rao (2013) call this the 'sandwich' approach, in which work at both local and national scales is layered into an effective single structure. A key part of this would be the national-level support for local-level capacities for disaster preparedness, rather than the hit-and-miss approach of local DRR and adaptation carried out by Red Cross Red Crescent and NGOs.

Sector approaches for including culture in disaster risk reduction

For two key sectors (the built environment, and health and medicine), some more specific ideas about what needs to be done for organizations to include culture are outlined below.

Housing and the built environment

In the section on the built environment (Chapter 5), the report highlights the importance of cultural considerations both in the construction of homes to withstand hazards and in the rebuilding of greater resilience in their aftermath. This is an especially important consideration given the projected rise in world population, the majority of whom will live in non-engineered, informal structures in sprawling urban conglomerations. Over the centuries, people learned to adapt the built environment to the hazards that confronted them. Design and construction, the materials and practices, and the uses of the buildings were part of a cultural adaptation to risk based on experience.

Unfortunately, much of this hard-earned knowledge has been lost and has been replaced by reinforced-concrete frame constructions that have become the building method of choice for a lot of urban and rural housing over the last half-century. Much of this construction takes place in unsupervised environments where the quality of materials and workmanship cannot be guaranteed. All too often, the result has been structural collapse and many deaths. Only recently have people begun to rediscover and adapt traditional construction practices to make safer homes in the future, with some DRR organizations playing a significant part in promoting the change. But the impact of disaster too often involves a loss of confidence in traditional values and structures, including local building cultures.

The aim of post-crisis assistance should be to enable affected people to recover through local capacities. Unfortunately, the requirements of organizations in shelter programming often exclude such approaches. Too often external 'experts' assume superior expertise and fail to acknowledge that they can learn as much as they might give. For DRR and adaptation of the built environment to climate change, external interventions need to recognize the importance of cultural criteria and the limitations of technical criteria, and increase the integration of local building skills and knowledge.

Cultures of health and medicine

Health and medicine are deeply rooted in culture (see Chapter 6). Organizations that engage in public health need to be able to understand that public health measures that are culturally sensitive have more potential for long-term success. Health-related relief that is based on biomedical knowledge often intervenes in cultures that have different values, beliefs, attitudes, experiences and behaviours. Disaster response that builds on existing value systems appears to be more successful than 'imported' approaches based on a concept of intervening, training

and then leaving (Barron, 2004; Bhugra, 2006). Humanitarian actors and agencies need to be prepared to adjust to local standards and conditions, and disaster medicine should ideally be embedded in preventive and curative health services such that (national) primary healthcare systems are put in a position to handle extreme situations.

On a political level, the way societies function in relation to risk also depends on cultural understandings, legal arrangements and economic interests, all of which are culturally affected. People's customs, norms or taboos often 'overrule' the importance of hazards and lead them not to cooperate in actions that seem obviously beneficial from the viewpoint of an outsider public health or DRR expert. The people who are targeted in public health campaigns also rarely respond in the way biomedical actors intend. They might, for instance, have long-standing interpretations of illnesses that differ from biomedical explanations or different priorities with regard to improving their well-being and livelihoods.

'Healing' can have other meanings than biomedical cure. Some people might understand it as an enhancement of well-being, as social integration or even as spiritual fulfilment. It is necessary to move beyond the situation where local perceptions are often considered mythical, mystical or inappropriate in DRR action or are regarded as being too vague to be incorporated in health interventions.

Conclusion

The report has emphasized that DRR cannot continue and be successful unless it incorporates culture – both people's own culture and a re-examination of that of the organizations involved. What makes this more significant is that climate change will increase the number of vulnerable people and worsen the extreme hazards. So, with more people at risk and more severe events, DRR will become even less effective unless it can include culture. In addition, some aspects of people's culture may lead them to ignore or avoid the threat of climate change or to deal with it in similar ways to natural hazards.

Climate change requires a complete rethink on how organizations do DRR. Where cultural factors are acting as barriers, therefore, it becomes even more important to understand and transform them. Institutional cultures must then evolve to take on the new challenges. Climate change can be regarded as a window of opportunity, in which DRR organizations can check and change their own outlook, beliefs and behaviours, and learn from the very visible cultural responses and blocks to dealing with global warming that are apparent in high-income countries and some religions. It is also an opportunity because of the way it provokes a re-think of how DRR is carried out, as the climate change aspect forces a focus on livelihoods and

people's everyday problems and needs. Adaptation requires dealing with food and nutrition, health and all other aspects of well-being alongside the disaster and extreme event components of climate change. It, therefore, offers the opportunity of integration as something that all DRR and adaptation organizations must seize with rapid enthusiasm.

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Disaster preparedness training is of the utmost importance in earthquake-prone regions. The buildings are part of the China Urban Search and Rescue Training Base, near Beijing. The buildings were deliberately constructed this way to enable training for earthquake rescue.

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Disaster data

According to the Centre for Research on the Epidemiology of Disasters (CRED), 337 disasters related to natural hazards and 192 related to technological hazards (typified hereafter as “natural disasters” and “technological disasters”) were reported worldwide in 2013.

The number of natural disasters was the lowest of the decade. As regards technological disasters, their number was the second lowest of the decade, almost half the number in 2005, the peak year of the decade.

Floods remain the most frequent natural disasters. Storms were the second most frequent, but the number of events in 2013 was slightly higher than the decade’s average.

The number of deaths caused by natural disasters (22,452) is almost 80 per cent below the average for the decade (97,954), much lower than the peak years of 2004 (242,829 deaths), 2008 (235,272 deaths) and 2010 (297,728 deaths).



View of houses destroyed by the wildfire that spread to populated areas in Valparaiso (Chile) in April 2014.

At least 2,500 homes were destroyed, leaving 11,000 people homeless.

© Vladimir Rodas

The two deadliest natural disasters of 2013 were Typhoon Haiyan, which hit the Philippines in November and killed 7,986 people, and a flood caused by monsoon rain which caused the death of 6,054 people in India in June. The death toll of these two disasters is very far from the number of deaths caused by the Indian Ocean tsunami in December 2004 (226,408 deaths) and the January 2010 earthquake in Haiti (222,570 deaths). Seventeen natural disasters caused at least 100 deaths each, for a total of 4,260. The total deaths from these major disasters (18,300) accounted for 81 per cent of all deaths from natural disasters. Floods accounted for 44 per cent of deaths caused by natural disasters and windstorms for 41 per cent.

The number of people killed by technological disasters (6,711) is 26 per cent below the decade's average (7,954). The event that resulted in the highest number of deaths (1,127) was the collapse of a textile factory building in Bangladesh. Eight other technological disasters led to more than 100 deaths each, for a total of 1,365. Fifty-seven per cent of deaths from technological disasters were related to transport accidents.

In 2013, the numbers of people reported affected by both natural and technological disasters were the lowest of the decade.

Far fewer people were reported affected by natural disasters in 2013 (almost 100 million people) than in the decade's peak years of 2010 (341 million) and 2011 (262 million). In 2013, 49 per cent of people reported affected were victims of storms. The most severe were Typhoon Haiyan in the Philippines, which affected 16 million people, and Cyclone Phailin in India with 13 million affected. Five other storms affected between 1 million and 8 million people for a total of 14.7 million; nine floods affected between 1 million and 3.5 million people for a total of 19.6 million; between 1 million and 5 million people were affected by four droughts for a total of 10.5 million; and two earthquakes affected a total of 5.5 million people. All these disasters accounted for 80 per cent of the total number of people affected by natural disasters.

Technological disasters affected, proportionally, very few people. The total of 22,000 people affected in 2013 is 74 per cent lower than the decade's average. Six disasters affected more than 1,000 people for a total of 16,000, or 73 per cent of all affected. The most severe was an explosion in a firework factory in Viet Nam which affected 4,500 people.

In 2013, natural disasters cost US\$ 118.6 billion, the fourth lowest of the decade. A flood in Germany cost almost US\$ 13 billion and Typhoon Haiyan, US\$ 10 billion. Thirty natural disasters (14 storms, 13 floods, 2 earthquakes and 1 extreme temperature episode) caused damages amounting to between US\$ 1 and US\$ 6 billion

for a total of US\$ 75 billion. All these disasters accounted for 83 per cent of total reported damages.

For technological disasters, the only damages reported in 2013 were for a gas leak in Republic of Korea (US\$ 30 million) and a fire in a village in Nepal (US\$ 1 million).

Cost of technological disasters amounted to a total of US\$ 578 million in 2013, far below the average for the decade of US\$ 2.8 billion. The costliest disasters were a train derailment followed by a fire in Canada, which caused damages estimated at US\$ 235 million, an explosion in a fertilizer plant in the United States, which cost US\$ 200 million, and a train derailment in Spain, which occasioned damages amounting to US\$ 138 million.

EM-DAT: a specialized disaster database

Tables 1–13 on natural and technological disasters and their human impact over the last decade were drawn and documented from CRED's EM-DAT: International Disasters Database (www.emdat.be). Established in 1973 as a non-profit institution, CRED is based at the School of Public Health of the Catholic University of Louvain in Belgium and became a World Health Organization (WHO) collaborating centre in 1980. Although CRED's main focus is on public health, it also studies the socio-economic and long-term effects of large-scale disasters.

Since 1988, CRED has maintained EM-DAT, a worldwide database on disasters. It contains essential core data on the occurrence and effects of more than 20,800 natural and technological disasters in the world from 1900 to the present. In 1999, CRED began collaborating with the United States Agency for International Development's Office of Foreign Disaster Assistance (USAID/OFDA).

The database is compiled from various sources, including United Nations (UN) agencies, non-governmental organizations, insurance companies, research institutes and press agencies. Priority is given to data from UN agencies, followed by OFDA, governments and IFRC. This prioritization is not a reflection of the quality or value of the data but the recognition that most reporting sources do not cover all disasters or may have political limitations that could affect the figures. The entries are constantly reviewed for redundancies, inconsistencies and the completion of missing data. CRED consolidates and updates data on a daily basis. A further check is made at monthly intervals. Revisions are made annually at the end of the calendar year.

The database's main objectives are to assist humanitarian action at both national and international levels, to rationalize decision-making for disaster preparedness and to provide an objective basis for vulnerability assessment and priority setting.

Data definitions and methodology

CRED defines a disaster as “a situation or event, which overwhelms local capacity, necessitating a request to national or international level for external assistance (definition considered in EM-DAT); an unforeseen and often sudden event that causes great damage, destruction and human suffering”.

For a disaster to be entered into the database, at least one of the following criteria must be fulfilled:

- Ten or more people reported killed
- 100 people or more reported affected
- Declaration of a state of emergency
- Call for international assistance.

The number of people killed includes people confirmed as dead and people missing and presumed dead. People affected are those requiring immediate assistance during a period of emergency (i.e., requiring basic survival needs such as food, water, shelter, sanitation and immediate medical assistance). People reported injured or homeless are aggregated with those reported affected to produce a ‘total number of people affected’.

The economic impact of a disaster usually consists of direct consequences on the local economy (e.g., damage to infrastructure, crops, housing) and indirect consequences (e.g., loss of revenues, unemployment, market destabilization). In EM-DAT, the registered figure corresponds to the damage value at the moment of the event and usually only to the direct damage, expressed in US dollars (2013 prices).

In 2007, a new natural disaster category classification was introduced in EM-DAT. This new classification was initiated by CRED and Munich Re, and brought together CRED, Munich Re, Swiss Re, the Asian Disaster Reduction Center (ADRC) and the UN Development Programme (UNDP). The goals were to create and agree on a common hierarchy and terminology for all global and regional databases on natural disasters and to establish a common and agreed definition of sub-events that is simple and self-explanatory.

This classification is a first step in the development of a standardized international classification of disasters. It distinguishes two generic categories for disasters (natural and technological). Natural disasters are divided into five sub-groups, which in turn cover 12 disaster types and more than 32 sub-types. The five sub-groups and 12 types are as follows:

- **Biological disasters:** Insect infestations, epidemics and animal attacks (the two last categories are not included in the *World Disasters Report*)
- **Geophysical disasters:** Earthquakes and tsunamis, volcanic eruptions, dry mass movements (avalanches, landslides, rockfalls and subsidence of geophysical origin)
- **Climatological disasters:** Droughts (with associated food insecurities), extreme temperatures and wildfires
- **Hydrological disasters:** Floods (including waves and surges), wet mass movements (avalanches, landslides, rockfalls and subsidence of hydrological origin)
- **Meteorological disasters:** Storms (divided into nine sub-categories).

Technological disasters remain unchanged and comprise three groups:

- **Industrial accidents:** Chemical spills, collapse of industrial infrastructure, explosions, fires, gas leaks, poisoning and radiation
- **Transport accidents:** Transportation by air, rail, road or water
- **Miscellaneous accidents:** Collapse of domestic or non-industrial structures, explosions and fires.

In Tables 1–13, ‘disasters’ refer to disasters with a natural and technological trigger only, and do not include wars, conflict-related famines, diseases or epidemics.

The classification of countries as ‘very high’, ‘high’, ‘medium’ or ‘low human development’ is based on UNDP’s 2013 Human Development Index (HDI). It should be noted that in 2013 HDI rankings changed for a significant number of countries. For a small number of countries, which do not appear in the HDI, the World Bank’s classification of economies by the countries’ level of income is used as reference (‘high’, ‘upper middle’ ‘lower middle’ and ‘low’).

In both EM-DAT and the tables in this annex, data are considered at country level for many reasons, including the fact that it is at this level that they are reported most of the time and also due to issues regarding possible aggregation and disaggregation of data. For droughts or food insecurities, which are often multi-years events, their impact over time is taken into account.

Bearing in mind that data on deaths and economic damage from drought are infrequently reported, CRED has adopted the following rules as regards data for droughts:

- The total number of deaths reported for a drought is divided by the number of years for which the drought persists. The resulting number is registered for each year of the drought’s duration.
- The same calculation is done for the reported economic damages.

- For the total number of people reported to be affected, CRED considers that the same number is affected each year that the disaster persists.

Some disasters begin at the end of a year and may last some weeks or months into the following year. In such cases, CRED has adopted the following rules:

- With regard to the numbers of people reported affected, the total number is recorded for both the start year and the end year.
- For the numbers of people reported killed, CRED distinguishes between sudden-onset disasters (earthquakes, flash floods, landslides, etc.) and slow-onset disasters (wildfires, some floods, extreme temperatures, etc.) as follows:
 - Sudden-onset disasters: All those killed are registered to the year the disaster started.
 - Slow-onset disasters: The total of all those killed is divided by two and a half is attributed to each year of persistence.
- Reported economic damages are always attributed to the end year of the disaster. This is because damage is related to both the strength of a disaster and its duration.

By using these rules, some data bias correction is attempted. However, they are far from perfect and CRED will try to improve them, as well as the database as a whole, in the future.

Caveats

Key problems with disaster data include the lack of standardized collection methodologies and definitions. The original information, collected from a variety of public sources, is not specifically gathered for statistical purposes. So, even when the compilation applies strict definitions for disaster events and parameters, the original suppliers of information may not. Moreover, data are not always complete for each disaster. The quality of completion may vary according to the type of disaster (for example, the number of people affected by transport accidents is rarely reported) or its country of occurrence.

Data on deaths are usually available because they are an immediate proxy for the severity of the disaster. However, the numbers put forward immediately after a disaster may sometimes be seriously revised, occasionally several months later.

Data on the numbers of people affected by a disaster can provide some of the most potentially useful figures, for planning both disaster preparedness and response, but they are sometimes poorly reported. Moreover, the definition of people affected remains open to interpretation, political or otherwise. Even in the

absence of manipulation, data may be extrapolated from old census information, with assumptions being made about percentages of an area's population affected.

Data can also be skewed because of the rationale behind data gathering. Reinsurance companies, for instance, systematically gather data on disaster occurrence in order to assess insurance risk, but with a priority in areas of the world where disaster insurance is widespread. Their data may therefore miss out poor, disaster-affected regions where insurance is unaffordable or unavailable.

For natural disasters over the last decade, data on deaths are missing or undocumented for 26 per cent of reported disasters, data on people affected are missing for 20 per cent of disasters; and data on economic damages are missing for 59 per cent of disasters. The figures should therefore be regarded as indicative. Relative changes and trends are more useful to look at than absolute, isolated figures.

Dates can be a source of ambiguity. For example, a declared date for a famine is both necessary and meaningless – a famine does not occur on a single day. In such cases, the date the appropriate body declares an official emergency has been used. Changes in national boundaries cause ambiguities in the data and may make long-term trend analysis more complicated.

However, in some cases, available data may differ greatly according to sources, be more or less documented estimations and/or subject to controversies. In these cases, CRED always compiles all available data or analysis to try to make its own documented estimation, which can be revised when more accurate data are provided.

Information systems have improved vastly in the last 35 years and statistical data are now more easily available, intensified by an increasing sensitivity to disaster occurrence and consequences. Nevertheless there are still discrepancies. An analysis of quality and accuracy of disaster data, performed by CRED in 2002, showed that occasionally, for the same disaster, differences of more than 20 per cent may exist between the quantitative data reported by the three major databases – EM-DAT (CRED), NatCat (Munich Re) and Sigma (Swiss Re).

Despite efforts to verify and review data, the quality of disaster databases can only be as good as the reporting system. This, combined with the different aims of the major disaster databases (risk and economic risk analysis for reinsurance companies, development agenda for CRED) may explain differences between data provided for some disasters. However, in spite of these differences, the overall trends indicated by the three databases remain similar.

The lack of systematization and standardization of data collection is a major weakness when it comes to long-term planning. Fortunately, due to increased pressures for accountability from various sources, many donors and development agencies have started paying attention to data collection and its methodologies.

Part of the solution to this data problem lies in retrospective analysis. Data are most often publicly quoted and reported during a disaster event, but it is only long after the event, once the relief operation is over, that estimates of damage and death can be verified. Some data gatherers, like CRED, revisit the data; this accounts for retrospective annual disaster figures changing one, two and sometimes even three years after the event.

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TABLE 1 Total number of reported disasters,¹ by continent, level of human development² and year (2004–2013)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total ³
Africa	164	170	202	184	173	156	132	163	123	114	1,581
Americas	138	139	105	133	144	115	144	130	115	105	1,268
Asia	321	360	308	262	240	233	253	235	210	229	2,651
Europe	98	125	98	104	58	75	99	49	91	69	866
Oceania	23	16	18	11	13	19	18	15	14	12	159
Very high human development	120	139	119	114	102	95	108	90	112	120	1,119
High human development	179	157	118	143	113	118	146	102	118	94	1,288
Medium human development	273	284	272	235	244	212	216	217	167	187	2,307
Low human development	172	230	222	202	169	173	176	183	156	128	1,811
Total	744	810	731	694	628	598	646	592	553	529	6,525

Source: EM-DAT, CRED, University of Louvain, Belgium

¹ In Tables 1–13, 'disasters' refer to those with a natural and/or technological trigger only, and do not include wars, conflict-related famines, diseases or epidemics.

² See note on UNDP's Human Development Index country status in the disaster definitions section in the introduction to this annex.

³ Since slow-onset disasters can affect the same country a number of years, it is best to use figures on total numbers to calculate annual averages over a decade rather than as absolute totals (see the methodology section in the introduction to this annex).

Note: Some totals in this table may not correspond due to rounding.

With 529 disasters reported, 2013 is the year with the decade's lowest number of disasters, very far below the peak of 2005. Among continents, the number of disasters was the lowest of the decade in Africa and in the Americas, the second lowest in Asia and Oceania, and the third lowest in Europe.

In 2013, numbers of disasters were at their lowest level in countries with high and low human development and at their second lowest in medium human development countries.

In countries with very high human development, the number of disasters in 2013 – the same number as in 2004 – was the second highest of the decade.

Over the decade, Asia is the continent most frequently affected with 41 per cent of all disasters. Africa comes second with 24 per cent.

TABLE 2 Total number of people reported killed, by continent, level of human development¹ and year (2004–2013)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
Africa	4,246	3,192	5,780	3,821	3,027	3,180	3,052	3,509	3,028	2,663	35,498
Americas	8,555	5,434	1,563	2,921	2,737	2,245	226,458	3,372	2,060	1,761	257,106
Asia	239,063	90,841	20,648	15,827	235,622	9,995	17,749	29,138	8,360	22,875	690,118
Europe	1,259	1,026	5,837	1,665	807	1,363	57,073	1,667	1,704	1,832	74,233
Oceania	35	46	24	273	25	888	140	221	433	32	2,117
Very high human development	1,278	3,226	4,506	1,645	1,051	2,458	2,024	21,840	1,438	2,481	41,947
High human development	38,804	2,908	3,681	2,983	2,022	3,063	59,204	3,692	2,714	1,815	120,886
Medium human development	201,867	14,624	19,507	7,916	95,866	8,338	14,182	7,729	5,746	19,770	395,545
Low human development	11,209	79,781	6,158	11,963	143,279	3,812	229,062	4,646	5,687	5,097	500,694
Total	253,156	100,539	33,852	24,507	242,218	17,671	304,472	37,907	15,585	29,163	1,059,072

Source: EM-DAT, CRED, University of Louvain, Belgium

¹ See note on UNDP's Human Development Index country status in the disaster definitions section in the introduction to this annex.

Note: Some totals in this table may not correspond due to rounding.

In 2013 the number of people reported killed was the third lowest of the decade, much lower than the peak years of 2004, 2008 and 2010 and than the average for the decade.

It was the lowest of the decade in Africa, the second lowest in the Americas and the third lowest in Oceania. On the other hand, it was the third highest in Europe and the fifth highest in Asia, but still much lower than the decade's average for both continents.

The numbers of people reported killed were the lowest of the decade in countries with high human development and the third lowest in countries with low human development. They were at their third highest level in medium human development countries and at their fourth highest in very high human development countries. However in both cases, these numbers were far below the decade's averages.

In 2013, 78 per cent of people killed by disasters lived in Asia, a percentage that is higher than the continent's average for the decade (65 per cent). The proportion of people killed in Africa (9 per cent) is also higher than its 3 per cent average for the decade.

The percentages of people reported killed in 2013 were 6 per cent in both the Americas and Europe and 0.1 per cent in Oceania, all of which are lower than the decade's average for these continents.

TABLE 3 Total number of people reported affected, by continent, level of human development¹ and year (2004–2013), in thousands

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total ²
Africa	36,902	22,856	26,665	12,530	22,653	42,636	33,965	31,423	45,675	8,261	283,566
Americas	9,703	8,308	1,455	9,119	20,314	7,046	12,789	11,877	5,844	2,731	89,186
Asia	132,860	129,717	119,101	190,885	182,754	174,056	292,534	217,987	89,729	87,017	1,616,640
Europe	538	525	260	1,651	268	141	834	79	581	1,750	6,627
Oceania	119	28	38	172	105	77	549	484	263	78	1,913
Very high human development	5,593	1,210	284	1,337	13,730	2,555	3,884	1,426	350	4,212	34,579
High human development	5,611	7,143	1,932	8,491	6,545	4,378	5,897	11,553	5,137	1,610	58,297
Medium human development	109,677	116,233	115,728	165,829	178,781	169,708	271,431	209,103	75,251	81,740	1,493,480
Low human development	59,241	36,850	29,576	38,699	27,039	47,316	59,459	39,768	61,353	12,275	411,576
Total	180,122	161,435	147,519	214,356	226,094	223,956	340,671	261,850	142,092	99,837	1,997,932

Source: EM-DAT, CRED, University of Louvain, Belgium

¹ See note on UNDP's Human Development Index country status in the disaster definitions section in the introduction to this annex.

² Since slow-onset disasters can affect the same people a number of years, it is best to use figures on total numbers affected to calculate annual averages over a decade rather than as absolute totals.

Note: Some totals in this table may not correspond due to rounding.

In 2013, almost 100 million people were affected by disasters, the lowest total of the decade, far below the high levels of 2007 to 2011 and half the average for the decade. In Africa and Asia, the number of people reported affected in 2013 was the lowest of the decade. It was the second lowest in the Americas and the fourth lowest in Oceania. In Europe, however, the number of people affected by disaster was the highest of the decade, and more than 2.5 times higher than the average for the decade.

In 2013, the number of people affected living in countries of high and low human development was the lowest of the decade. It was the second lowest in medium human development countries. In very high human development countries, however, it was the third highest of the decade.

In 2013, Asia accounted for 87 per cent of people reported affected, above its 81 per cent average for the decade. The four other continents' proportions of people reported affected by disaster were all below their average for the decade.

TABLE 4 Total amount of disaster estimated damage, by continent; level of human development¹ and year (2004–2013), in millions of US dollars (2013 prices)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
Africa	2,133	42	273	759	1,021	193	65	1,084	971	241	6,783
Americas	83,695	211,476	8,495	18,311	71,779	16,589	85,459	72,346	107,494	34,770	710,415
Asia	84,451	33,962	27,984	39,995	131,927	19,781	41,962	292,738	28,354	58,521	759,674
Europe	2,317	19,315	2,892	25,505	5,196	13,538	19,804	3,133	25,293	22,427	139,419
Oceania	702	269	1,531	1,664	2,804	1,930	18,355	21,929	893	3,259	53,336
<i>Very high human development</i>	<i>137,032</i>	<i>215,200</i>	<i>13,814</i>	<i>52,955</i>	<i>72,437</i>	<i>29,371</i>	<i>100,695</i>	<i>315,792</i>	<i>129,593</i>	<i>52,134</i>	<i>1,119,023</i>
<i>High human development</i>	<i>11,602</i>	<i>15,833</i>	<i>2,105</i>	<i>13,508</i>	<i>8,053</i>	<i>4,044</i>	<i>15,295</i>	<i>8,948</i>	<i>6,709</i>	<i>9,041</i>	<i>95,138</i>
<i>Medium human development</i>	<i>19,420</i>	<i>27,525</i>	<i>25,251</i>	<i>13,663</i>	<i>127,054</i>	<i>18,048</i>	<i>30,193</i>	<i>63,662</i>	<i>23,019</i>	<i>56,255</i>	<i>404,090</i>
<i>Low human development</i>	<i>5,244</i>	<i>6,505</i>	<i>4</i>	<i>6,108</i>	<i>5,184</i>	<i>568</i>	<i>19,461</i>	<i>2,829</i>	<i>3,683</i>	<i>1,788</i>	<i>51,374</i>
Total	173,298	265,064	41,175	86,233	212,727	52,031	165,645	391,231	163,005	119,217	1,669,626

Source: EM-DAT, CRED, University of Louvain, Belgium

¹ See note on UNDP's Human Development Index country status in the disaster definitions section in the introduction to this annex.

Note: Some totals in this table may not correspond due to rounding.

As mentioned in the introduction, damage assessment is frequently unreliable. Even for the existing data, the methodologies are not standardized and the financial coverage can vary significantly. Depending on where the disaster occurred and who reports it, estimations may vary from zero to billions of US dollars.

The total amount of damage reported in 2013 was the fourth lowest of the decade. It was also the fourth lowest in Africa and the Americas. But it was the fourth highest in Asia and the third highest in Europe and Oceania. However, in Asia and Oceania, the amount of damages remained below their average for the decade.

The amounts of damages were the third lowest in very high and low human development countries, but the fifth highest in high human development countries and the third highest in those of medium development.

The contribution of Europe to the total amount of damages climbed to 19 per cent, far higher than their 8 per cent average for the decade. On the other hand, the contribution of the Americas in 2013 (29 per cent) was largely below its average for the decade (43 per cent). Asia accounted for 49 per cent of all reported damages, slightly above its average for the decade (46 per cent). Contributions of Oceania (3 per cent) and Africa (0.2 per cent) were lower than their respective 3.2 and 0.4 per cent average for the decade.

The highest contribution to total damages (47 per cent) came from medium human development countries, far above their 24 per cent average for the decade. Disaster damages in very high human development countries accounted for 44 per cent of total damages, a much lower percentage than their 67 per cent average for the decade.

TABLE 5 Total number of reported disasters, by type of phenomenon and year (2004–2013)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
Droughts/food insecurity	19	28	20	13	21	31	27	24	30	12	225
Earthquakes/tsunamis	42	25	24	21	23	22	25	30	29	28	269
Extreme temperatures	19	29	32	25	11	26	34	19	52	17	264
Floods ²	135	193	232	219	175	159	189	159	142	149	1,752
Forest/scrub fires	8	13	10	18	5	9	7	7	7	10	94
Insect infestation	12	n.d.r.	1	n.d.r.	n.d.r.	1	n.d.r.	n.d.r.	n.d.r.	n.d.r.	14
Mass movement: dry ³	1	n.d.r.	1	n.d.r.	3	1	n.d.r.	n.d.r.	1	1	8
Mass movement: wet ⁴	16	12	20	10	12	29	32	18	13	11	173
Volcanic eruptions	5	8	12	6	7	3	6	6	1	3	57
Windstorms	128	131	77	105	111	87	91	85	90	106	1,011
Subtotal climato-, hydro- and meteorological disasters	337	406	392	390	335	342	380	312	334	305	3,533
Subtotal geophysical disasters	48	33	37	27	33	26	31	36	31	32	334
Total natural disasters	385	439	429	417	368	368	411	348	365	337	3,867
Industrial accidents	81	76	64	53	38	43	36	32	25	25	473
Miscellaneous accidents	62	66	33	43	30	27	47	34	26	31	399
Transport accidents	216	229	205	181	192	160	152	178	137	136	1,786
Total technological disasters	359	371	302	277	260	230	235	244	188	192	2,658
Total	744	810	731	694	628	598	646	592	553	529	6,525

Source: EM-DAT, CRED, University of Louvain, Belgium

¹ Since slow-onset disasters can affect the same country a number of years, it is best to use figures on total numbers to calculate annual averages over a decade rather than as absolute totals (see the methodology chapter of this annex).

² Includes waves and surges.

³ Landslides, rockfalls, subsidence, etc. of geophysical origin.

⁴ Landslides, avalanches, subsidence, etc. of hydrological origin.

Notes: Some totals in this table may not correspond due to rounding. In this table, n.d.r. signifies 'no disaster reported'. For more information, see section on caveats in the introductory text to this annex.

In 2013, the number of natural disasters was the lowest of the decade and the number of technological disasters the second lowest. Among natural disasters, floods and windstorms were the most frequent but the contribution of windstorms to the total number of disasters

(31 per cent) was higher than their proportion for the decade (26 per cent). The numbers of disasters caused by droughts were at their lowest level for the decade, those caused by mass movements of hydrological origin, extreme temperatures and volcanic eruptions at their second lowest, and those caused by floods at their third lowest. On the other hand, disasters occasioned by storms, earthquakes and wildfires were at their fourth highest level for the decade.

Among technological disasters, transport accidents were the most frequent, but their number in 2013 was the lowest of the decade, as was the number of industrial accidents.

TABLE 6 Total number of people reported killed, by type of phenomenon and year (2004–2013)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
Droughts/food insecurity	80	88	208	n.a.	6	2	n.a.	n.a.	n.a.	n.a.	384
Earthquakes/tsunamis	227,290	76,241	6,692	780	87,918	1,888	226,735	20,946	711	1,120	650,321
Extreme temperatures	856	814	5,104	1,044	1,608	1,212	57,064	806	1,598	1,982	72,088
Floods ¹	7,366	5,754	5,845	8,565	4,029	3,534	8,571	6,142	3,582	9,819	63,207
Forest/scrub fires	14	47	16	150	86	190	135	10	22	35	705
Insect infestation	n.a.	n.d.r.	n.a.	n.d.r.	n.d.r.	n.a.	n.d.r.	n.d.r.	n.d.r.	n.d.r.	n.a.
Mass movement: dry ²	44	n.d.r.	11	n.d.r.	120	36	n.d.r.	n.d.r.	16	46	273
Mass movement: wet ³	568	646	1,638	271	504	657	3,402	314	504	235	8,739
Volcanic eruptions	2	3	5	11	16	n.a.	323	3	n.a.	n.a.	363
Windstorms	6,609	5,294	4,329	6,035	140,985	3,287	1,498	3,103	3,102	9,215	183,457
Subtotal climato-, hydro- and meteorological disasters	15,493	12,643	17,140	16,065	147,218	8,882	70,670	10,375	8,808	21,286	328,580
Subtotal geophysical disasters	227,336	76,244	6,708	791	88,054	1,924	227,058	20,949	727	1,166	650,957
Total natural disasters	242,829	88,887	23,848	16,856	235,272	10,806	297,728	31,324	9,535	22,452	979,537
Industrial accidents	1,797	2,281	1,857	1,667	776	933	1,061	684	787	1,907	13,750
Miscellaneous accidents	2,115	2,669	1,126	909	895	911	1,507	755	1,112	1,003	13,002
Transport accidents	6,417	6,702	7,021	5,075	5,275	5,021	4,176	5,144	4,151	3,801	52,783
Total technological disasters	10,329	11,652	10,004	7,651	6,946	6,865	6,744	6,583	6,050	6,711	79,535
Total	253,158	100,539	33,852	24,507	242,218	17,671	304,472	37,907	15,585	29,163	1,059,072

Source: EM-DAT, CRED, University of Louvain, Belgium

¹ Includes waves and surges.

² Landslides, rockfalls, subsidence, etc. of geophysical origin.

³ Landslides, avalanches, subsidence, etc. of hydrological origin.

Notes: Some totals in this table may not correspond due to rounding. In this table, n.a. signifies 'no data available' and n.d.r., 'no disaster reported'. For more information, see section on caveats in the introductory text to this annex.

In 2013, the number of people killed by natural disasters was at their fourth lowest level of the decade and deaths caused by technological disasters at their third lowest.

Among natural disasters, the number of deaths caused by floods was the highest of the decade, windstorms the second highest and extreme temperatures the third highest.

However, when looking at their contribution to the total number of deaths in 2013, the number caused by floods (44 per cent) was much higher than their 6 per cent average for

the decade, as was the number of deaths from windstorms (41 per cent in 2013 versus a 19 per cent average for the decade). However, deaths caused by earthquakes represented only 5 per cent of total deaths against a 67 per cent average for the decade.

The two deadliest natural disasters in 2013 were Typhoon Haiyan in the Philippines (7,986 deaths) and a monsoonal flood in India (6,054 deaths).

The major disasters of the decade were the Indian Ocean tsunami in 2004 (226,408 deaths), the Haiti earthquake in 2010 (222,570 deaths), Cyclone Nargis in Myanmar in 2008 (138,375 deaths), the Sichuan earthquake in China in 2008 (87,476 deaths), the 2005 Kashmir earthquake (74,648 deaths) and a heatwave in Russia in 2010 (55,736 deaths).

Among technological disasters, the number of deaths from industrial accidents were the second highest of the decade, while deaths caused by transport accidents were the lowest. The deadliest technological disaster was caused by the collapse of a textile factory building in Bangladesh (1,127 deaths).

TABLE 7 Total number of people reported affected, by type of phenomenon and year (2004–2013), in thousands

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
Droughts/food insecurity	35,272	30,643	44,371	8,278	37,481	109,666	132,525	75,604	43,837	11,224	528,901
Earthquakes/tsunamis	3,147	6,187	3,859	1,382	47,580	3,221	6,937	1,748	2,860	7,031	83,953
Extreme temperatures	2,140	2	63	988	79,171	856	892	4,427	636	270	89,446
Floods ²	117,569	75,027	31,124	177,840	46,066	58,983	188,870	141,398	74,536	32,051	943,464
Forest/scrub fires	21	7	3	1,785	59	12	30	15	6	9	1,947
Insect infestation	n.a.	n.d.r.	n.a.	n.d.r.	n.d.r.	500	n.d.r.	n.d.r.	n.d.r.	n.d.r.	500
Mass movement: dry ³	<1	n.d.r.	<1	n.d.r.	<1	3	n.d.r.	n.d.r.	n.a.	<1	4
Mass movement: wet ⁴	230	10	432	9	5	44	2,460	7	4	1	3,202
Volcanic eruptions	53	341	379	51	40	57	171	46	10	105	1,251
Windstorms	21,383	49,117	67,112	23,974	15,652	50,583	8,749	38,551	20,178	49,124	344,423
<i>Subtotal climato-, hydro- and meteorological disasters</i>	<i>176,615</i>	<i>154,806</i>	<i>143,106</i>	<i>212,875</i>	<i>178,435</i>	<i>220,642</i>	<i>333,527</i>	<i>260,001</i>	<i>139,197</i>	<i>92,679</i>	<i>1,911,882</i>
<i>Subtotal geophysical disasters</i>	<i>3,200</i>	<i>6,528</i>	<i>4,237</i>	<i>1,433</i>	<i>47,621</i>	<i>3,281</i>	<i>7,108</i>	<i>1,793</i>	<i>2,870</i>	<i>7,136</i>	<i>85,209</i>
Total natural disasters	179,815	161,335	147,343	214,308	226,056	223,923	340,634	261,795	142,068	99,815	1,997,091
Industrial accidents	157	16	137	3	14	6	27	<1	4	8	372
Miscellaneous accidents	102	77	35	41	21	23	7	48	17	7	379
Transport accidents	48	6	4	4	4	5	3	6	3	6	89
Total technological disasters	307	100	175	48	39	33	37	55	24	22	841
Total	180,122	161,435	147,519	214,356	226,094	223,956	340,671	261,850	142,092	99,837	1,997,932

Source: EM-DAT, CRED, University of Louvain, Belgium

¹ Since slow-onset disasters can affect the same people a number of years, it is best to use figures on total numbers affected to calculate annual averages over a decade rather than as absolute totals.

² Includes waves and surges.

³ Landslides, rockfalls, subsidence, etc. of geophysical origin.

⁴ Landslides, avalanches, subsidence, etc. of hydrological origin.

Notes: Some totals in this table may not correspond due to rounding. In this table, n.a. signifies 'no data available'; n.d.r. signifies 'no disaster reported'. For more information, see section on caveats in introductory text.

In 2013, the number of people reported affected by both natural and technological disasters was the lowest of the decade.

Among natural disasters, windstorms were the disaster that affected the highest number of people in 2013 (49 million). This figure is also the third highest of the decade for windstorms and is far above the decade's average of 34 million. The storms contributed to 49 per cent of the total affected, against the 17 per cent average for the decade.

Floods affected 32 million people and droughts 11 million, far below their decade's average of 94 and 52 million, respectively. The numbers of people reported affected by all other natural disasters were also below their average for the decade in 2013.

The numbers of people affected by miscellaneous accidents were the lowest of the decade. In 2013, the three disasters that affected the most people were three windstorms: Typhoon Haiyan in the Philippines (16 million) and cyclones Phailin (13 million) and Utor (8 million) in China.

TABLE 8 Total amount of disaster estimated damage, by type of phenomenon and year (2004–2013), in millions of US dollars (2013 prices)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
Droughts/food insecurity	1,901	2,405	3,733	586	242	2,286	3,649	11,294	25,867	1,817	53,779
Earthquakes/tsunamis	49,234	8,242	4,086	17,332	95,640	6,774	52,051	245,676	19,373	9,075	507,484
Extreme temperatures	n.a.	492	1,191	n.a.	24,457	1,230	508	833	160	1,000	29,871
Floods ¹	13,572	21,631	9,702	27,768	22,044	8,949	52,407	76,024	26,765	53,175	312,035
Forest/scrub fires	4	4,606	1,118	5,322	2,709	1,694	2,278	3,133	1,254	1,072	23,190
Insect infestation	n.a.	n.d.r.	n.a.	n.d.r.	n.d.r.	n.a.	n.d.r.	n.d.r.	n.d.r.	n.d.r.	n.a.
Mass movement: dry ²	n.a.	n.d.r.	n.a.	n.d.r.	n.a.	n.a.	n.d.r.	n.d.r.	n.a.	n.a.	n.a.
Mass movement: wet ³	13	68	48	n.a.	n.a.	172	1,405	n.a.	n.a.	n.a.	1,706
Volcanic eruptions	n.a.	n.a.	179	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	179
Windstorms	106,912	227,105	21,118	34,219	67,635	29,220	30,949	54,269	89,554	52,492	713,472
Subtotal climato- hydro- and meteorological disasters	122,402	256,306	36,909	67,895	117,087	43,551	91,196	145,553	143,600	109,556	1,134,054
Subtotal geophysical disasters	49,234	8,242	4,264	17,332	95,640	6,774	52,051	245,676	19,373	9,083	507,670
Total natural disasters	171,637	264,548	41,173	85,227	212,727	50,325	143,247	391,228	162,973	118,639	1,641,724
Industrial accidents	1,143	504	n.a.	1,006	n.a.	1,707	22,122	n.a.	31	200	26,713
Miscellaneous accidents	n.a.	13	1	n.a.	n.a.	n.a.	275	<1	1	5	296
Transport accidents	518	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	2	n.a.	373	893
Total technological disasters	1,661	516	1	1,006	n.a.	1,707	22,397	3	32	578	27,902
Total	173,298	265,064	41,175	86,233	212,727	52,031	165,645	391,231	163,005	119,217	1,669,626

Source: EM-DAT, CRED, University of Louvain, Belgium

¹ Includes waves and surges.

² Landslides, rockfalls, subsidence, etc. of geophysical origin.

³ Landslides, avalanches, subsidence, etc. of hydrological origin.

Notes: Some totals in this table may not correspond due to rounding. In this table, n.a. signifies 'no data available'; n.d.r. signifies 'no disaster reported'. For more information, see section on caveats in introductory text. Estimates of disaster damage must be treated with caution, as the financial value attached to infrastructures in developed countries is much higher than in developing countries. While reporting is better for large disasters, the low reporting rates of direct damage make analysis difficult.

In 2013, damages from natural disasters were the fourth lowest of the decade. Damages caused by floods were the second highest for the decade and accounted for 45 per cent of natural disaster damages, a percentage much higher than their 19 per cent average for the decade. While windstorms accounted for almost as much damage caused by natural disasters as floods, at 44 per cent in 2013, this percentage is very close to their 43 per cent average for the decade. Damages reported for earthquakes in 2013, however, represent less than 20 per cent of their average for the decade. Damages resulting from geophysical disasters accounted for only 8 per cent of natural disaster damages, far below their decade's average of 31 per cent.

A flood in Germany in May caused more than US\$ 12 billion in damages and Typhoon Haiyan, US\$ 10 billion.

TABLE 9 Total number of reported disasters, by type of phenomenon, continent and level of human development¹ (2004–2013)

	Africa	Americas	Asia	Europe	Oceania	VHHD	HHH	MHD	LHD	Total
Droughts/food insecurity	124	51	37	9	4	14	25	57	129	225
Earthquakes/tsunamis	18	39	174	27	11	41	71	121	36	269
Extreme temperatures	2	43	65	153	1	123	73	44	24	264
Floods ²	443	343	702	215	49	237	378	585	552	1,752
Forest/scrub fires	10	39	9	28	8	62	15	11	6	94
Insect infestation	13	n.d.r.	n.d.r.	n.d.r.	1	1	n.d.r.	2	11	14
Mass movement: dry ³	1	2	4	n.d.r.	1	n.d.r.	1	6	1	8
Mass movement: wet ⁴	12	34	115	8	4	7	33	84	49	173
Volcanic eruptions	5	20	22	1	9	5	12	30	10	57
Windstorms	82	336	400	139	54	384	146	347	134	1,011
<i>Subtotal climato-, hydro- and meteorological disasters</i>	686	846	1,328	552	121	828	670	1,130	905	3,533
<i>Subtotal geophysical disasters</i>	24	61	200	28	21	46	84	157	47	334
Total natural disasters	710	907	1,528	580	142	874	754	1,287	952	3,867
Industrial accidents	55	32	343	41	2	26	66	319	62	473
Miscellaneous accidents	97	49	192	60	1	44	81	169	105	399
Transport accidents	719	280	588	185	14	175	387	532	682	1,786
Total technological disasters	871	361	1,123	286	17	245	534	1,020	859	2,658
Total	1,581	1,268	2,651	866	159	1,119	1,288	2,307	1,811	6,525

Source: EM-DAT, CRED, University of Louvain, Belgium

¹ See note on UNDP's Human Development Index country status in the disaster definitions section in the introduction to this annex. VHHD stands for very high human development, HHD for high human development, MHD for medium human development and LHD for low human development.

² Includes waves and surges.

³ Landslides, rockfalls, subsidence, etc. of geophysical origin.

⁴ Landslides, avalanches, subsidence, etc. of hydrological origin.

Notes: Some totals in this table may not correspond due to rounding. In this table, n.d.r. signifies 'no disaster reported'. For more information, see section on caveats in introductory text.

During the decade, Asia accounted for 41 per cent of the total number of disasters but for 76 per cent of industrial accidents, 66 per cent of mass movements of hydrological origin, 65 per cent of earthquakes/tsunamis, 48 per cent of miscellaneous accidents, 40 per cent of floods and 40 per cent of windstorms.

Africa accounted for 24 per cent of the total number of disasters but for 93 per cent of insect infestations, 55 per cent of droughts/food insecurities and 40 per cent of transport accidents.

The Americas accounted for 19 per cent of the total number of disasters but for 41 per cent of wildfires, 35 per cent of volcanic eruptions and 33 per cent of windstorms.

Europe accounted for 13 per cent of the total number of disasters but for 58 per cent of extreme temperatures and 30 per cent of wildfires.

Oceania accounted for 2.5 per cent of the total number of disasters but for 16 per cent of volcanic eruptions, 8 per cent of wildfires and 7 per cent of insect infestations.

During the decade, medium and low human development countries accounted for 63 per cent of all disasters. Medium human development countries accounted for 35 per cent of the total number of disasters but for 67 per cent of industrial disasters, 53 per cent of volcanic eruptions, 49 per cent of mass movements of hydrological origin, 45 per cent of earthquakes and 42 per cent of miscellaneous accidents. Low human development countries accounted for 28 per cent of the total number of disasters but for 79 per cent of insect infestations, 57 per cent of droughts and 39 per cent of transport accidents.

High human development countries accounted for 20 per cent of the total number of disasters but for 27 per cent of earthquakes and extreme temperatures.

Very high human development countries accounted for 17 per cent of the total number of disasters but for 65 per cent of wildfires, 47 per cent of extreme temperatures and 38 per cent of windstorms.

TABLE 10 Total number of people reported killed, by type of phenomenon, continent and level of human development¹
(2004–2013)

	Africa	Americas	Asia	Europe	Oceania	VHHD	HHH	MHD	LHD	Total
Droughts/food insecurity	246	4	134	n.a.	n.a.	n.a.	12	138	234	384
Earthquakes/tsunamis	1,014	223,873	423,927	1,076	431	21,036	38,019	293,941	297,325	650,321
Extreme temperatures	22	1,731	5,969	64,019	347	7,775	58,879	3,051	2,383	72,088
Floods ²	7,156	9,990	44,847	1,075	139	1,136	7,081	34,175	20,815	63,207
Forest/scrub fires	128	78	67	229	203	463	92	92	58	705
Insect infestation	n.a.	n.d.r.	n.d.r.	n.d.r.	n.a.	n.a.	n.d.r.	n.a.	n.a.	n.a.
Mass movement: dry ³	98	48	117	n.d.r.	10	n.d.r.	12	251	10	273
Mass movement: wet ⁴	589	892	7,098	66	94	119	797	5,857	1,966	8,739
Volcanic eruptions	6	23	334	n.a.	n.a.	n.a.	21	330	12	363
Windstorms	1,514	11,034	170,261	396	252	6,102	911	26,404	150,040	183,457
Subtotal climato- hydro- and meteorological disasters	9,655	23,729	228,376	65,785	1,035	15,595	67,772	69,717	175,496	328,580
Subtotal geophysical disasters	1,118	223,944	424,378	1,076	441	21,036	38,052	294,522	297,347	650,957
Total natural disasters	10,773	247,673	652,754	66,861	1,476	36,631	105,824	364,239	472,843	979,537
Industrial accidents	2,068	721	9,961	971	29	328	1,712	7,901	3,809	13,750
Miscellaneous accidents	2,236	2,219	7,099	1,438	10	924	2,719	6,644	2,715	13,002
Transport accidents	20,421	6,493	20,304	4,963	602	4,064	10,631	16,761	21,327	52,783
Total technological disasters	24,725	9,433	37,364	7,372	641	5,316	15,062	31,306	27,851	79,535
Total	35,498	257,106	690,118	74,233	2,117	41,947	120,886	395,545	500,694	1,059,072

Source: EM-DAT, CRED, University of Louvain, Belgium

¹ See note on UNDP's Human Development Index country status in the disaster definitions section in the introduction to this annex. VHHD stands for very high human development, HHD for high human development, MHD for medium human development and LHD for low human development.

² Includes waves and surges.

³ Landslides, rockfalls, subsidence, etc. of geophysical origin.

⁴ Landslides, avalanches, subsidence, etc. of hydrological origin.

Notes: Some totals in this table may not correspond due to rounding. In this table, n.a. signifies 'no data available'; n.d.r. signifies 'no disaster reported'. For more information, see section on caveats in introductory text.

During the decade, Asia accounted for 65 per cent of the total number of people killed by disasters but for 93 per cent of deaths from industrial accidents, 92 per cent of deaths from volcanic eruptions, 81 per cent of deaths from mass movements of hydrological origin, 72 per cent of deaths from industrial accidents and 71 per cent of those from floods.

The Americas accounted for 24 per cent of all deaths from disasters but for 34 per cent of deaths from earthquakes. Europe accounted for 7 per cent of the total number of deaths from disasters but for 89 per cent of deaths from extreme temperatures and 32 per cent

from wildfires. Africa accounted for 3 per cent of the total number of deaths but for 64 per cent of deaths from droughts and 39 per cent from transport accidents. Oceania accounted for 0.2 per cent of the total number of deaths but for 29 per cent of deaths from wildfires.

During the decade, 85 per cent of people killed by disasters lived in medium and low human development countries. Low human development countries accounted for 47 per cent of the total number of deaths from disasters but for 82 per cent of deaths caused by windstorms and 61 per cent from droughts.

Medium human development countries accounted for 37 per cent of people killed by disasters, but for 91 per cent of deaths from volcanic eruptions, 67 per cent of those from mass movements of hydrological origin, 57 per cent from industrial accidents, 54 per cent from floods and 51 per cent from miscellaneous accidents.

High human development countries accounted for 11 per cent of all deaths from disasters, but for 82 per cent of those from extreme temperatures and 20 per cent from transport and miscellaneous accidents.

Very high human development countries accounted for only 4 per cent of disaster deaths but for 66 per cent of those caused by wildfires and 10 per cent of those from extreme temperatures.

TABLE 11 Total number of people reported affected, by type of phenomenon, continent and level of human development¹ (2004–2013), in thousands

	Africa	Americas	Asia	Europe	Oceania	VHHD	HHH	MHD	LHD	Total
Droughts/food insecurity	248,668	9,492	270,518	216	6	n.a.	5,580	282,330	240,991	528,901
Earthquakes/tsunamis	171	8,741	74,163	247	631	4,010	2,476	67,972	9,495	83,953
Extreme temperatures	8	3,491	85,417	529	2	149	3,962	84,658	678	89,446
Floods ²	30,061	44,132	865,130	3,320	821	14,866	33,592	760,602	134,404	943,464
Forest/scrub fires	15	878	25	1,017	12	791	1,013	132	12	1,947
Insect infestation	500	n.d.r.	n.d.r.	n.d.r.	n.a.	n.a.	n.d.r.	n.a.	500	500
Mass movement: dry ³	<1	3	<1	n.d.r.	n.a.	n.d.r.	n.a.	4	n.a.	4
Mass movement: wet ⁴	36	93	3,063	<1	10	23	10	2,510	659	3,202
Volcanic eruptions	295	437	468	n.a.	51	12	348	568	323	1,251
Windstorms	3,471	21,885	317,425	1,264	379	14,690	11,281	294,326	24,127	344,423
<i>Subtotal climato- hydro- and meteorological disasters</i>	<i>282,758</i>	<i>79,971</i>	<i>1,541,577</i>	<i>6,346</i>	<i>1,230</i>	<i>30,518</i>	<i>55,437</i>	<i>1,424,558</i>	<i>401,370</i>	<i>1,911,882</i>
<i>Subtotal geophysical disasters</i>	<i>467</i>	<i>9,181</i>	<i>74,632</i>	<i>247</i>	<i>683</i>	<i>4,022</i>	<i>2,824</i>	<i>68,545</i>	<i>9,818</i>	<i>85,209</i>
Total natural disasters	283,224	89,152	1,616,209	6,593	1,913	34,540	58,261	1,493,103	411,187	1,997,091
Industrial accidents	119	18	223	11	<1	27	6	219	121	372
Miscellaneous accidents	207	6	148	19	n.a.	3	22	142	213	379
Transport accidents	15	10	60	4	<1	10	8	17	54	89
Total technological disasters	342	34	431	34	<1	39	36	377	388	841
Total	283,566	89,186	1,616,640	6,627	1,913	34,579	58,297	1,493,480	411,576	1,997,932

Source: EM-DAT, CRED, University of Louvain, Belgium

¹ See note on UNDP's Human Development Index country status in the disaster definitions section in the introduction to this annex. VHHH stands for very high human development, HHD for high human development, MHD for medium human development and LHD for low human development.

² Includes waves and surges.

³ Landslides, rockfalls, subsidence, etc. of geophysical origin.

⁴ Landslides, avalanches, subsidence, etc. of hydrological origin.

Notes: Some totals in this table may not correspond due to rounding. In this table, n.a. signifies 'no data available'; n.d.r. signifies 'no disaster reported'. For more information, see section on caveats in introductory text.

During the decade, the highest proportion of people affected by disasters was in Asia (81 per cent) but the continent accounted for 96 per cent of people affected by extreme temperatures and mass movements of hydrological origin and for 92 per cent of people affected by windstorms and floods.

Africa accounted for 14 per cent of people affected by disasters but for 54 per cent of those affected by miscellaneous accidents, 47 per cent affected by droughts, 32 per cent affected by industrial accidents and 24 per cent affected by volcanic eruptions.

The Americas accounted for 4.5 per cent of people affected by disasters but for 45 per cent of those affected by wildfires, 35 per cent affected by storms and 11 per cent affected by transport accidents.

Europe accounted for only 0.3 per cent of people affected by disasters but for 52 per cent of those affected by wildfires and 4 per cent of those affected by technological disasters.

Oceania accounted for only 0.1 per cent of people affected by disasters but for 4 per cent of those affected by volcanic eruptions and 0.7 per cent of those affected by earthquakes.

Medium and low human development countries accounted for 95 per cent of all people affected by disasters. Medium human development countries accounted for 75 per cent of the total number of people reported affected by disasters but for 95 per cent of those affected by extreme temperature, 85 per cent affected by windstorms and 81 per cent affected by earthquakes/tsunamis and floods.

Low human development countries accounted for 21 per cent of the total number of people reported affected by disasters but for 61 per cent of those affected by transport accidents, 56 per cent affected by miscellaneous accidents, 46 per cent affected by droughts and 33 per cent affected by industrial accidents.

High human development countries accounted for 4 per cent of the total number of people reported affected by disasters but for 52 per cent of those affected by wildfires, 28 per cent affected by volcanic eruptions and 9 per cent affected by transport accidents.

Very high human development countries accounted for less than 2 per cent of the total number of people reported affected by disasters but for 40 per cent of those affected by wildfires and 11 per cent affected by transport accidents.

TABLE 12 Total amount of disaster estimated damage, by type of phenomenon, continent and level of human development¹ (2004–2013), in millions of US dollars (2013 prices)

	Africa	Americas	Asia	Europe	Oceania	VHHD	HHH	MHD	LHD	Total
Droughts/food insecurity	64	33,693	11,047	8,153	823	33,783	8,259	11,586	151	53,779
Earthquakes/tsunamis	832	45,147	412,744	22,177	26,583	356,182	8,926	125,533	16,843	507,484
Extreme temperatures	n.a.	2,763	24,847	2,261	n.a.	2,860	2,164	24,847	<1	29,871
Floods ²	3,529	50,676	193,225	51,109	13,496	96,321	25,266	167,301	23,146	312,035
Forest/scrub fires	479	10,869	314	9,487	2,042	20,676	1,984	531	n.a.	23,190
Insect infestation	n.a.	n.d.r.	n.d.r.	n.d.r.	n.a.	n.a.	n.d.r.	n.a.	n.a.	n.a.
Mass movement: dry ³	n.a.	n.a.	8	n.d.r.	n.a.	n.d.r.	n.a.	8	n.a.	8
Mass movement: wet ⁴	n.a.	567	1,139	n.a.	n.a.	17	n.a.	1,670	20	1,706
Volcanic eruptions	n.a.	179	n.a.	n.a.	n.a.	n.a.	179	n.a.	n.a.	179
Windstorms	862	543,779	115,065	43,374	10,392	586,056	44,841	71,881	10,694	713,472
<i>Subtotal climato- hydro- and meteorological disasters</i>	<i>4,935</i>	<i>642,346</i>	<i>345,637</i>	<i>114,384</i>	<i>26,753</i>	<i>739,713</i>	<i>82,514</i>	<i>277,815</i>	<i>34,012</i>	<i>1,134,054</i>
<i>Subtotal geophysical disasters</i>	<i>832</i>	<i>45,326</i>	<i>412,752</i>	<i>22,177</i>	<i>26,583</i>	<i>356,182</i>	<i>9,104</i>	<i>125,541</i>	<i>16,843</i>	<i>507,670</i>
Total natural disasters	5,767	687,671	758,390	136,561	53,336	1,095,895	91,618	403,356	50,855	1,641,724
Industrial accidents	1,016	22,216	761	2,720	n.a.	22,480	3,503	730	n.a.	26,713
Miscellaneous accidents	n.a.	292	3	n.a.	n.a.	275	17	2	1	296
Transport accidents	n.a.	235	520	138	n.a.	373	n.a.	2	518	893
Total technological disasters	1,016	22,743	1,285	2,858	n.a.	23,129	3,520	734	519	27,902
Total	6,783	710,415	759,674	139,419	53,336	1,119,023	95,138	404,090	51,374	1,669,626

Source: EM-DAT, CRED, University of Louvain, Belgium

¹ See note on UNDP's Human Development Index country status in the disaster definitions section in the introduction to this annex. VHHD stands for very high human development, HHD for high human development, MHD for medium human development and LHD for low human development.

² Includes waves and surges.

³ Landslides, rockfalls, subsidence, etc. of geophysical origin.

⁴ Landslides, avalanches, subsidence, etc. of hydrological origin.

Notes: Some totals in this table may not correspond due to rounding. In this table, n.a. signifies 'no data available'; n.d.r. signifies 'no disaster reported'. For more information, see section on caveats in introductory text. Estimates of disaster damage must be treated with caution, as the financial value attached to infrastructures in developed countries is much higher than in developing countries. While reporting is better for large disasters, the low reporting rates of direct damage make analysis difficult.

During the decade, Asia accounted for 46 per cent of the reported damages but for 81 per cent of costs related to earthquakes, 67 per cent of those from mass movements of hydrological origin, 61 per cent of damages from floods and 58 per cent of those from transport accidents.

The Americas accounted for 43 per cent of total reported damages, but for 98 per cent of those from miscellaneous accidents, 83 per cent of those from industrial accidents, 76 per cent of those from storms and 63 per cent of those from droughts.

Europe accounted for 8 per cent of reported damages but for 40 per cent of those from wildfires, 16 per cent of those caused by floods and 15 per cent of those from droughts and transport accidents.

Oceania accounted for 3 per cent of all damages but for 8 per cent of those from wildfires.

Africa accounted for only 0.4 per cent of all reported damages but for 4 per cent of those from industrial accidents and 2 per cent of those caused by wildfires.

Sixty-seven per cent of disaster damages were reported from very high human development countries and 24 per cent from medium human development countries.

TABLE 13 Total number of people reported killed and affected by disasters by country and territory (1994–2003; 2004–2013; and 2013)

	Total number of people reported killed (1994–2003)	Total number of people reported affected (1994–2003)	Total number of people reported killed (2004–2013)	Total number of people reported affected (2004–2013)	Total number of people reported killed (2013)	Total number of people reported affected (2013)
AFRICA	43,671	267,405,621	35,498	283,565,969	2,663	8,260,959
Algeria	4,054	321,742	637	154,295	n.d.r.	n.d.r.
Angola	1,404	330,152	631	2,867,675	25	1,003
Benin	265	834,305	258	1,220,809	22	38,253
Botswana	23	144,276	12	14,226	12	4,210
Burkina Faso	45	252,290	474	6,169,063	16	11,406
Burundi	219	1,989,405	284	6,917,316	n.d.r.	n.d.r.
Cameroon	776	6,378	717	94,906	n.a.	2,344
Cape Verde	18	46,306	60	1	n.d.r.	n.d.r.
Central African Republic	190	80,666	243	121,242	62	41,737
Chad	131	1,586,977	175	8,958,763	n.a.	1,600,000
Comoros	256	300	521	351,785	35	n.a.
Congo, Democratic Republic of the	2,196	264,643	3,268	207,393	16	n.a.
Congo, Republic of	200	184,631	473	56,904	n.d.r.	n.d.r.
Côte d'Ivoire	383	173	277	114,064	n.d.r.	n.d.r.
Djibouti	146	321,125	196	1,523,339	n.d.r.	n.d.r.
Egypt	2,363	170,094	2,642	7,871	134	204
Equatorial Guinea	2	1,000	103	4,300	n.d.r.	n.d.r.
Eritrea	105	11,500,025	56	1,707,043	n.d.r.	n.d.r.
Ethiopia	1,017	30,537,718	1,360	54,833,298	n.a.	51,500
Gabon	31	n.a.	107	80,421	30	n.a.
Gambia	66	45,269	60	494,027	2	3,300

TABLE 13 Total number of people reported killed and affected by disasters by country and territory (1994–2003; 2004–2013; and 2013)

	Total number of people reported killed (1994–2003)	Total number of people reported affected (1994–2003)	Total number of people reported killed (2004–2013)	Total number of people reported affected (2004–2013)	Total number of people reported killed (2013)	Total number of people reported affected (2013)
Ghana	573	1,170,960	652	686,679	22	25,005
Guinea	366	220,095	462	146,397	25	11,106
Guinea Bissau	217	101,500	169	90,956	n.d.r.	n.d.r.
Kenya	1,403	98,747,744	2,027	26,871,945	223	115,824
Lesotho	1	1,333,751	66	2,410,590	n.d.r.	n.d.r.
Liberia	70	7,000	25	536,926	10	n.a.
Libya	174	28	688	2,147	41	2,022
Madagascar	802	4,511,827	1,086	6,221,856	65	44,879
Malawi	701	18,192,729	232	13,488,141	3	97,385
Mali	119	44,776	406	9,838,591	122	46,221
Mauritania	178	3,118,887	192	3,173,631	18	6,570
Mauritius	8	4,350	24	82	11	82
Mayotte (FR)	n.d.r.	n.d.r.	54	12	n.d.r.	n.d.r.
Morocco	1,697	949,774	1,491	130,290	39	72
Mozambique	1,674	9,787,428	687	6,212,250	119	240,000
Namibia	21	1,083,409	295	1,413,450	33	345,500
Niger	181	7,347,941	245	29,001,579	44	181,029
Nigeria	8,149	1,133,651	5,242	8,915,019	421	81,555
Reunion (FR)	2	3,700	2	90	n.d.r.	n.d.r.
Rwanda	338	2,984,990	180	4,039,206	n.d.r.	n.d.r.
Saint Helena (GB)	n.a.	300	n.d.r.	n.d.r.	n.d.r.	n.d.r.

TABLE 13 Total number of people reported killed and affected by disasters by country and territory (1994–2003; 2004–2013; and 2013)

	Total number of people reported killed (1994–2003)	Total number of people reported affected (1994–2003)	Total number of people reported killed (2004–2013)	Total number of people reported affected (2004–2013)	Total number of people reported killed (2013)	Total number of people reported affected (2013)
Sao Tome and Principe	n.d.r.	n.d.r.	33	34	n.d.r.	n.d.r.
Senegal	1,547	885,020	394	2,372,287	49	163,319
Seychelles	5	8,037	3	7,830	n.a.	3,000
Sierra Leone	865	200,025	587	23,542	18	2,257
Somalia	2,730	4,020,989	1,072	18,770,049	169	247,380
South Africa	2,169	518,773	1,317	15,445,982	141	7,175
South Sudan ¹			146	738,000	99	581,000
Sudan	1,355	8,794,434	1,362	13,464,754	310	401,048
Swaziland	30	1,499,559	25	1,391,685	n.d.r.	n.d.r.
Tanzania, United Republic of	2,276	16,955,963	1,210	8,089,900	84	n.a.
Togo	3	291,905	168	299,785	n.d.r.	n.d.r.
Tunisia	311	27,180	406	7,160	n.d.r.	n.d.r.
Uganda	1,082	3,257,396	1,100	5,051,834	44	25,455
Zambia	325	3,214,395	390	3,624,111	53	1,800
Zimbabwe	409	28,369,630	506	15,200,438	146	3,877,318
AMERICAS	76,595	61,208,759	257,106	89,185,795	1,761	2,730,799
Anguilla (GB)	n.a.	150	n.d.r.	n.d.r.	n.d.r.	n.d.r.
Antigua and Barbuda	6	11,684	n.a.	30,800	n.d.r.	n.d.r.
Argentina	432	887,737	662	656,833	99	350,479
Aruba (NL)	n.d.r.	n.d.r.	n.d.r.	n.d.r.	n.d.r.	n.d.r.
Bahamas	1	n.a.	123	31,582	30	1,000
Barbados	n.a.	2,000	1	3,381	n.d.r.	n.d.r.

TABLE 13 Total number of people reported killed and affected by disasters by country and territory (1994–2003; 2004–2013; and 2013)

	Total number of people reported killed (1994–2003)	Total number of people reported affected (1994–2003)	Total number of people reported killed (2004–2013)	Total number of people reported affected (2004–2013)	Total number of people reported killed (2013)	Total number of people reported affected (2013)
Belize	75	145,170	11	68,000	n.d.r.	n.d.r.
Bermuda	22	n.a.	n.d.r.	n.d.r.	n.d.r.	n.d.r.
Bolivia	884	916,456	863	2,964,615	160	793,074
Brazil	2,301	22,181,893	3,770	7,386,274	383	261,415
Canada	445	86,238	133	139,706	61	102,100
Cayman Islands (GB)	n.a.	300	2	n.a.	n.d.r.	n.d.r.
Chile	197	597,859	906	3,069,996	16	21
Colombia	2,899	2,110,721	2,515	12,751,798	7	42,957
Costa Rica	126	873,073	131	430,110	n.d.r.	n.d.r.
Cuba	280	8,047,747	261	3,702,883	2	227
Dominica	16	5,891	2	7,870	n.d.r.	n.d.r.
Dominican Republic	804	1,083,783	1,221	380,613	n.a.	n.a.
Ecuador	839	450,038	399	989,837	36	28,758
El Salvador	1,862	2,086,201	588	565,207	n.a.	63,079
Falkland Islands (GB)	n.d.r.	n.d.r.	n.d.r.	n.d.r.	n.d.r.	n.d.r.
French Guiana (FR)	n.a.	70,000	n.d.r.	n.d.r.	n.d.r.	n.d.r.
Greenland (DK)	n.d.r.	n.d.r.	n.d.r.	n.d.r.	n.d.r.	n.d.r.
Grenada	n.a.	210	40	61,650	n.d.r.	n.d.r.
Guadeloupe (FR)	24	899	1	153	n.d.r.	n.d.r.
Guatemala	1,081	348,750	2,316	5,787,808	44	612
Guyana	10	1,252,600	34	409,774	n.d.r.	n.d.r.

TABLE 13 Total number of people reported killed and affected by disasters by country and territory (1994–2003; 2004–2013; and 2013)

	Total number of people reported killed (1994–2003)	Total number of people reported affected (1994–2003)	Total number of people reported killed (2004–2013)	Total number of people reported affected (2004–2013)	Total number of people reported killed (2013)	Total number of people reported affected (2013)
Haiti	2,497	1,841,855	229,529	5,026,813	28	33,265
Honduras	14,975	3,052,143	854	1,199,522	n.d.r.	n.d.r.
Jamaica	18	27,500	57	621,066	n.d.r.	n.d.r.
Martinique (FR)	n.a.	600	3	106	n.d.r.	n.d.r.
Mexico	3,654	2,837,988	1,781	11,449,926	337	173,759
Montserrat (GB)	32	13,000	n.a.	200	n.d.r.	n.d.r.
Netherlands Antilles (NL)	17	40,004	n.d.r.	n.d.r.	n.d.r.	n.d.r.
Nicaragua	3,496	1,642,274	432	574,135	27	14,149
Panama	55	42,585	135	113,370	n.a.	n.a.
Paraguay	168	525,354	419	2,141,025	n.a.	186,400
Peru	3,376	4,319,613	3,718	7,182,368	233	280,969
Puerto Rico (US)	122	167,390	41	7,285	n.d.r.	n.d.r.
Saint Kitts and Nevis	5	12,980	n.d.r.	n.d.r.	n.d.r.	n.d.r.
Saint Lucia	4	1,125	17	173,000	6	170,000
Saint Pierre et Miquelon (FR)	4	100	n.d.r.	n.d.r.	n.d.r.	n.d.r.
Saint Vincent and the Grenadines	n.d.r.	n.d.r.	13	21,000	13	13,091
Suriname	10	n.a.	25	31,548	n.d.r.	n.d.r.
Trinidad and Tobago	n.a.	617	3	1,760	n.d.r.	n.d.r.
Turks and Caicos Islands (GB)	43	n.a.	107	1,850	18	32
United States of America	5,288	4,787,883	5,255	20,894,963	245	215,376
Uruguay	99	25,547	48	144,020	n.d.r.	n.d.r.
Venezuela	30,418	700,798	690	162,948	16	36

TABLE 13 Total number of people reported killed and affected by disasters by country and territory (1994–2003; 2004–2013; and 2013)

	Total number of people reported killed (1994–2003)	Total number of people reported affected (1994–2003)	Total number of people reported killed (2004–2013)	Total number of people reported affected (2004–2013)	Total number of people reported killed (2013)	Total number of people reported affected (2013)
Virgin Islands (GB)	n.a.	3	n.d.r.	n.d.r.	n.d.r.	n.d.r.
Virgin Islands (US)	10	10,000	n.a.	n.a.	n.d.r.	n.d.r.
ASIA	825,476	2,643,097,996	690,118	1,616,639,884	22,875	87,017,240
Afghanistan	10,098	8,436,660	4,419	4,712,493	228	21,655
Armenia	20	319,906	1	76,000	n.a.	76,000
Azerbaijan	596	2,478,111	56	97,499	n.d.r.	n.d.r.
Bahrain	143	n.a.	92	60	13	n.a.
Bangladesh	11,259	50,508,051	11,881	76,395,387	1,227	1,608,407
Bhutan	239	66,600	24	20,028	n.d.r.	n.d.r.
Brunei Darussalam	n.a.	n.a.	n.d.r.	n.d.r.	n.d.r.	n.d.r.
Cambodia	1,148	25,446,614	931	4,047,015	200	1,500,000
China, People's Republic of ^{2,3}	35,202	1,524,460,318	113,545	1,087,329,093	1,797	27,469,043
Georgia	181	1,412,890	13	145,032	n.a.	26,750
Hong Kong (China) ²	187	8,909	74	15,713	n.d.r.	n.d.r.
India	69,300	697,323,825	46,078	170,233,654	7,781	16,709,159
Indonesia	8,194	8,513,312	181,979	10,807,067	265	692,728
Iran, Islamic Republic of	32,645	113,312,218	3,326	572,173	128	6,056
Iraq	135	7	1,553	74,746	11	n.a.
Israel	106	1,897	81	2,023,250	4	2,003,000
Japan	6,041	1,830,029	21,704	1,556,784	430	127,160
Jordan	136	330,352	60	92	17	32

TABLE 13 Total number of people reported killed and affected by disasters by country and territory (1994–2003; 2004–2013; and 2013)

	Total number of people reported killed (1994–2003)	Total number of people reported affected (1994–2003)	Total number of people reported killed (2004–2013)	Total number of people reported affected (2004–2013)	Total number of people reported killed (2013)	Total number of people reported affected (2013)
Kazakhstan	240	650,842	318	102,943	21	5,000
Korea, Democratic People's Republic of	610,449	74,431,915	1,692	5,661,911	51	848,690
Korea, Republic of	2,744	711,476	480	112,759	n.d.r.	n.d.r.
Kuwait	2	200	44	76	n.d.r.	n.d.r.
Kyrgyzstan	306	69,881	230	2,047,747	n.d.r.	n.d.r.
Lao People's Democratic Republic	185	3,274,405	152	1,374,330	72	574,253
Lebanon	48	17,555	135	54	n.d.r.	n.d.r.
Macau (China) ³	n.d.r.	n.d.r.	n.a.	133	n.d.r.	n.d.r.
Malaysia	660	103,168	310	532,851	104	75,207
Maldives	10	n.a.	133	28,963	n.d.r.	n.d.r.
Mongolia	208	3,936,711	98	1,553,234	n.d.r.	n.d.r.
Myanmar	423	352,338	139,597	3,320,929	221	73,349
Nepal	3,200	654,615	2,531	2,810,255	259	16,848
Oman	83	91	139	20,224	n.d.r.	n.d.r.
Pakistan	6,374	19,348,757	82,150	47,324,932	797	1,698,760
Palestine (West Bank and Gaza) ⁴	14	20	11	35,365	6	32,600
Philippines	7,251	32,529,252	22,446	93,601,543	8,541	25,667,719
Qatar	n.d.r.	n.d.r.	49	n.a.	n.d.r.	n.d.r.
Saudi Arabia	1,111	15,144	1,177	12,595	39	1,021
Singapore	n.a.	1,200	n.d.r.	n.d.r.	n.d.r.	n.d.r.
Sri Lanka	705	5,802,518	35,893	7,526,033	117	81,500

TABLE 13 Total number of people reported killed and affected by disasters by country and territory (1994–2003; 2004–2013; and 2013)

	Total number of people reported killed (1994–2003)	Total number of people reported affected (1994–2003)	Total number of people reported killed (2004–2013)	Total number of people reported affected (2004–2013)	Total number of people reported killed (2013)	Total number of people reported affected (2013)
Syrian Arab Republic	322	668,377	211	3,900,410	n.d.r.	n.d.r.
Taiwan (China)	3,493	1,166,427	944	2,361,770	10	1,670
Tajikistan	193	6,261,765	261	3,304,900	n.a.	2,500
Thailand	2,023	28,467,123	10,585	63,059,551	204	3,515,274
Timor-Leste ^a	4	3,558	1	10,127	n.d.r.	n.d.r.
Turkmenistan	51	n.a.	15	n.a.	n.d.r.	n.d.r.
United Arab Emirates	140	39	87	32	22	24
Uzbekistan	131	1,223,988	73	5,116	n.d.r.	n.d.r.
Viet Nam	8,384	28,689,836	3,334	18,306,656	234	4,133,721
Yemen	1,092	267,096	1,205	1,518,359	76	49,114
EUROPE	108,430	32,825,282	74,233	6,626,883	1,832	1,749,949
Albania	11	205,484	93	670,932	n.d.r.	n.d.r.
Austria	628	70,494	37	1,621	4	200
Azores (PT)	74	1,215	n.d.r.	n.d.r.	n.d.r.	n.d.r.
Belarus	92	23,499	9	13,275	4	11,325
Belgium	1,254	4,699	1,023	1,295	11	n.a.
Bosnia and Herzegovina	62	73,079	25	340,087	n.d.r.	n.d.r.
Bulgaria	20	1,940	142	52,145	n.d.r.	n.d.r.
Canary Islands (ES)	38	730	130	550	n.d.r.	n.d.r.
Croatia	875	4,000	40	2,916	n.d.r.	n.d.r.
Cyprus	59	3,087	48	80	n.d.r.	n.d.r.

TABLE 13 Total number of people reported killed and affected by disasters by country and territory (1994–2003; 2004–2013; and 2013)

	Total number of people reported killed (1994–2003)	Total number of people reported affected (1994–2003)	Total number of people reported killed (2004–2013)	Total number of people reported affected (2004–2013)	Total number of people reported killed (2013)	Total number of people reported affected (2013)
Czech Republic	511	302,206	124	1,320,280	15	1,300,000
Denmark	8	n.a.	7	2,072	2	n.a.
Estonia	934	170	14	100	n.d.r.	n.d.r.
Finland	11	33	24	415	n.d.r.	n.d.r.
France	20,199	3,594,820	1,672	513,157	10	2,192
Germany	9,749	466,456	227	9,170	11	6,352
Gibraltar (GB)	n.d.r.	n.d.r.	n.d.r.	n.d.r.	n.d.r.	n.d.r.
Greece	580	159,775	414	14,804	12	n.a.
Hungary	231	147,241	656	106,830	n.a.	64,365
Iceland	34	282	n.a.	n.a.	n.d.r.	n.d.r.
Ireland	42	1,000	2	800	n.d.r.	n.d.r.
Isle of Man (GB)	n.d.r.	n.d.r.	n.d.r.	n.d.r.	n.d.r.	n.d.r.
Italy	21,075	129,309	1,438	92,343	487	3,063
Latvia	42	n.a.	104	29	54	29
Lithuania	64	n.a.	64	n.a.	n.d.r.	n.d.r.
Luxembourg	190	n.a.	n.a.	n.a.	n.d.r.	n.d.r.
Macedonia, Former Yugoslav Republic of	27	7,906	34	1,113,754	1	4,911
Malta	283	n.a.	139	31	27	n.a.
Moldova	62	2,655,037	38	246,098	n.d.r.	n.d.r.
Montenegro ⁶	n.d.r.	n.d.r.	14	13,668	13	32
Netherlands	1,106	255,294	1,033	133	2	n.a.

TABLE 13 Total number of people reported killed and affected by disasters by country and territory (1994–2003; 2004–2013; and 2013)

	Total number of people reported killed (1994–2003)	Total number of people reported affected (1994–2003)	Total number of people reported killed (2004–2013)	Total number of people reported affected (2004–2013)	Total number of people reported killed (2013)	Total number of people reported affected (2013)
Norway	270	6,130	22	612	n.d.r.	n.d.r.
Poland	984	240,968	1,271	107,368	29	53
Portugal	2,854	153,638	143	5,126	21	3,999
Romania	444	249,088	682	152,967	9	5,400
Russian Federation	6,938	3,976,755	59,059	527,341	214	337,144
Serbia ⁶	n.d.r.	n.d.r.	34	139,244	n.a.	3,000
Serbia-Montenegro ⁶	128	80,023	63	40,262	n.d.r.	n.d.r.
Slovakia	85	48,039	191	11,613	1	n.a.
Slovenia	289	700	20	13,655	n.d.r.	n.d.r.
Spain	15,724	12,071,913	554	25,381	79	740
Sweden	67	162	14	n.a.	7	n.a.
Switzerland	1,171	6,810	59	5,688	n.a.	84
Turkey	20,002	5,507,816	1,971	244,180	35	n.a.
Ukraine	593	2,084,263	1,718	441,987	2	2,260
United Kingdom	620	291,221	881	394,874	782	4,800
OCEANIA	3,426	21,376,249	2,117	1,913,221	32	77,720
American Samoa (US)	6	3	34	25,560	n.d.r.	n.d.r.
Australia	373	19,629,034	831	475,507	22	8,940
Cook Islands (NZ)	19	1,644	n.a.	2,810	n.d.r.	n.d.r.
Fiji	76	298,727	67	88,408	n.d.r.	n.d.r.
French Polynesia (FR)	13	511	21	3,411	n.d.r.	n.d.r.

TABLE 13 Total number of people reported killed and affected by disasters by country and territory (1994–2003; 2004–2013; and 2013)

	Total number of people reported killed (1994–2003)	Total number of people reported affected (1994–2003)	Total number of people reported killed (2004–2013)	Total number of people reported affected (2004–2013)	Total number of people reported killed (2013)	Total number of people reported affected (2013)
Guam (US)	229	21,564	1	300	n.d.r.	n.d.r.
Kiribati	n.a.	84,000	n.a.	85	n.d.r.	n.d.r.
Marshall Islands	n.d.r.	n.d.r.	n.a.	6,984	n.a.	6,384
Micronesia, Federated States of	47	31,423	1	6,008	n.d.r.	n.d.r.
Nauru	n.d.r.	n.d.r.	n.d.r.	n.d.r.	n.d.r.	n.d.r.
New Caledonia (FR)	2	1,100	n.d.r.	n.d.r.	n.d.r.	n.d.r.
New Zealand	24	3,417	251	623,516	n.a.	13,840
Niue (NZ)	n.d.r.	n.d.r.	1	702	n.d.r.	n.d.r.
Northern Mariana Islands	n.a.	300	3	200	n.d.r.	n.d.r.
Palau	1	12,004	n.a.	n.a.	n.a.	n.a.
Papua New Guinea	2,472	1,241,732	571	535,736	n.a.	35,000
Samoa	n.a.	n.a.	165	18,288	n.d.r.	n.d.r.
Solomon Islands	n.a.	1,915	85	45,509	10	13,556
Tokelau (NZ)	n.d.r.	n.d.r.	n.a.	26	n.d.r.	n.d.r.
Tonga	n.a.	23,071	84	561	n.d.r.	n.d.r.
Tuvalu	18	n.a.	n.a.	n.a.	n.d.r.	n.d.r.
Vanuatu	146	25,804	2	78,358	n.d.r.	n.d.r.
Wallis and Futuna (FR)	n.d.r.	n.d.r.	n.a.	1,252	n.d.r.	n.d.r.
World	1,057,598	3,025,913,907	1,059,072	1,997,931,752	29,163	99,836,667

Source: EM-DAT, CRED, University of Louvain, Belgium

¹ South Sudan became an independent state on 9 July 2011.

² Since July 1997, Hong Kong has been included in China as Special Administrative Region (SAR)

³ Since December 1999, Macau has been included in China as Special Administrative Region (SAR)

⁴ Since September 1993 and the Israel-PLO Declaration of Principles, the Gaza Strip and the West Bank have a Palestinian self-government. Direct negotiations to determine the permanent status of these territories began in September 1999 but are far from a permanent agreement.

⁵ Since May 2002, Timor-Leste has been an independent country.

⁶ From 1992 to 2003 Serbia and Montenegro were considered one country (Yugoslavia); in 2003, Yugoslavia became the State Union of Serbia and Montenegro and, in 2006, two separate countries: Serbia and Montenegro.

Notes: Some totals in this table may not correspond due to rounding. In this table, n.a. signifies 'no data available'; n.d.r. signifies 'no disaster reported'. For more information, see section on caveats in introductory text.

Over the last decade, the highest numbers of deaths per continent were reported in Nigeria (Africa), Haiti (the Americas), Indonesia (Asia), Russian Federation (Europe) and Australia (Oceania).

The highest numbers of disaster-affected people per continent were reported in Ethiopia (Africa), the United States of America (the Americas), China (Asia), Czech Republic (Europe) and New Zealand (Oceania).

Compared to the period from 1994 to 2003, the past decade has seen disaster deaths remain stable and the numbers affected by disasters reduced by one-third.

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The Fundamental Principles of the International Red Cross and Red Crescent Movement

Humanity The International Red Cross and Red Crescent Movement, born of a desire to bring assistance without discrimination to the wounded on the battlefield, endeavours, in its international and national capacity, to prevent and alleviate human suffering wherever it may be found. Its purpose is to protect life and health and to ensure respect for the human being. It promotes mutual understanding, friendship, cooperation and lasting peace among all peoples.

Impartiality It makes no discrimination as to nationality, race, religious beliefs, class or political opinions. It endeavours to relieve the suffering of individuals, being guided solely by their needs, and to give priority to the most urgent cases of distress.

Neutrality In order to continue to enjoy the confidence of all, the Movement may not take sides in hostilities or engage at any time in controversies of a political, racial, religious or ideological nature.

Independence The Movement is independent. The National Societies, while auxiliaries in the humanitarian services of their governments and subject to the laws of their respective countries, must always maintain their autonomy so that they may be able at all times to act in accordance with the principles of the Movement.

Voluntary service It is a voluntary relief movement not prompted in any manner by desire for gain.

Unity There can be only one Red Cross or Red Crescent Society in any one country. It must be open to all. It must carry on its humanitarian work throughout its territory.

Universality The International Red Cross and Red Crescent Movement, in which all societies have equal status and share equal responsibilities and duties in helping each other, is worldwide.

World Disasters Report 2014

Focus on culture and risk

This year's *World Disasters Report* focuses on culture and risk. The report explores the different ways in which culture affects disaster risk reduction and climate change adaptation and how disasters and risk influence culture. It examines why people choose to live in hazard-prone locations, and how culture and beliefs enable them to live with the risks they face. The report looks at the organizational culture of agencies working in the fields of disaster risk reduction and adaptation, and challenges the widespread faith in community-based activities. It also considers culture in relation to housing and reconstruction, and healthcare and medicine. Finally, the report indicates starting points for organizations to better align their actions with the way people think and act.

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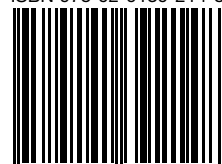
- The links between culture and risk
- How religion and beliefs influence perceptions of and attitudes towards risk
- Taking livelihoods seriously
- The myth of community?
- Culture, risk and the built environment
- Culturally sensitive public health: the HIV/AIDS disaster and beyond
- Putting culture at the centre of risk reduction
- Disaster data

“*Around the world today there is increasing awareness of the role of human factors in disasters and the critical importance of a culturally sensitive approach to disaster risk management. Culture shapes perceptions and behaviours and frames peoples' relationship to others and their environment. Traditional cultures often include skills that mitigate risks associated with natural hazards. The safeguarding of cultural landmarks and living heritage contributes to resilience, building a sense of continuity and hope among affected people. In its efforts to strengthen the capacities of the most vulnerable to better anticipate and adapt to disasters – through early warning systems, training kits or scientific expertise – UNESCO can testify to the essential role of local cultures in designing more effective responses. By shedding light on this vital relationship, this edition of the World Disasters Report provides the much-needed rationale for the integration of culture in disaster risk reduction and climate change mitigation at all levels.*”

Irina Bokova, Director-General of UNESCO

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