

Disasters and Development

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Climate-related disasters are defined by development: Poor people are disproportionately affected (Pelling, 2003; Wisner et al., 2004; Ribot, 2010). In the first place, natural hazards are unevenly distributed. In 2007, Asia was the region hardest hit and most affected by natural disasters, accounting for 37 per cent of reported disasters and 90 per cent of all the reported victims (Dodman et al., 2009). Human-induced climate change impacts such as sea-level rise and increased climate extremes are likely to have the heaviest impact on small island developing states, the poorest countries in the world and African nations (IPCC, 2007).

Development context determines vulnerability to natural hazards. For example, individuals and households that have reliable access to food and adequate food reserves, clean water, health care and education will inevitably be better prepared to deal with a variety of shocks and stresses – including those arising because of climate change (Dodman et al., 2009). The role of development in determining the risk posed by natural hazards is now well established in the disaster-risk reduction literature (Anderson and Woodrow, 1989; Wisner et al., 2004; Kelly and Adger, 2009).

But what does this relationship mean for managing adaptation to climate-related disasters? Does the role of development in defining climate-related risks have implications for how those risks are (or should be) responded to? Should climate disasters be managed differently in developed and developing countries? This chapter addresses these questions with reference to the case studies within this book and elsewhere.

21.1 The Relationship between Development and Climate-Related Disasters

The role of development in defining disasters is underpinned by the concept of 'vulnerability'. 'Vulnerability' is broadly understood as 'being prone to or susceptible to damage or injury' (Wisner et al., 2004: 9).

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However, the extent to which this matters to different groups is determined by factors related to their socio-economic development. Large landowners may have more efficient irrigation and drainage systems than small farmers; wealthier households may have the means (capacity, education, resources) to diversify their income options during the wet season; poorer households may be more exposed to injury and have fewer means to access healthcare systems during times of crisis. This is summed up by Ribot (2010) in the following statement:

The poor and wealthy, women and men, young and old, and people of different social identities or political stripes, experience different risks while facing the same climatic event... the inability to manage stress does not fall from the sky. (Ribot, 2010: 49)

From this perspective, the role of development is not in defining exposure to a specific hazard but in enabling or undermining adaptive capacity in order to build resilience to a range of stresses including climatic hazards. Development defines the 'drivers' or underlying causes of vulnerability that determine not only whether people are exposed in the first place but also whether they are able to cope with and adapt to that exposure.

21.2 The Role of Development in Shaping Climate-Related Disaster Risk Reduction and Response

Different frameworks for understanding vulnerability shape the role of development in disaster response and in climate change adaptation. Early attempts to develop guidelines for mitigating disasters resulted in conventional disaster management approaches that specifically targeted the impacts of hazards, with policy recommendations for managing disasters focusing on narrowly technological engineering approaches to controlling the physical environment (Pelling, 2001; Wisner et al., 2004). This approach demanded solutions designed by a small team of highly technical experts that could analyse the hazard and develop targeted technical responses.

However, during the 1980s, many observers from disaster risk reduction and development studies began to draw attention to the link between the risks people face and the reasons behind their vulnerability to these risks in the first place (Sen, 1981; Hewitt, 1983; Anderson and Woodrow, 1989; Blaikie et al., 1994). Since then, three decades of work in disaster risk reduction have highlighted the ways in which technological approaches to risk management have focused consultations on expert opinion to the exclusion of stakeholders and communities set to benefit from the outcomes (Pelling, 2001).

This recognition led to a shift in disaster management in developing countries that began to recognise and address factors related to under-development as a first step in building resilience to disasters. This, in turn, gave rise to development-focused solutions and locally appropriate, livelihoods-based support in building resilience from the bottom-up.

This latter approach demands a more participatory approach to defining local risks and developing locally appropriate responses. Taking a 'social vulnerability'-based perspective on climate change risk shifts the emphasis of risk assessment away from climate change impacts and towards the local circumstances of vulnerability. This recognition has led proponents of a social vulnerability approach to argue that risk assessments that inform risk-reduction policies need to be more locally responsive and therefore inclusive (Huq et al., 2004; Few et al., 2007; Ayers, 2011). If the factors that determine vulnerability are context specific, designing risk-reduction interventions to address these factors requires a knowledge base that is tailored to local settings. Participatory and locally driven responses are therefore not only ethical but also practical when development priorities are taken as the starting point for risk reduction (Few et al., 2007). This perspective gave rise to community-based disaster risk-reduction approaches in under-developed contexts that prioritise locally appropriate development interventions designed with the participation of vulnerable communities. This approach is now well established as one of the pillars of human security within the Disaster Risk Reduction (DRR) field (Pelling, 2003).

This approach is in contrast to the early paradigm of climate change that focused on the impact of biophysical change in the atmosphere rather than the factors that make people vulnerable to these changes. 'Adaptation' to climate change emerged from this context to deal with the impacts of non-mitigated greenhouse gas emissions, resulting in an 'impacts-based' approach to managing climate change risk (Burton et al., 2002). The primary adaptation focus was 'technology-based' interventions such as dams, early warning systems, seeds and irrigation schemes based on specific knowledge of future climate conditions (Klein, 2008).

This impacts-based approach shifts the balance of climate-related disaster management back towards a hazard-risk framework that implies a particular type of scientific or technological expertise is needed to assess climate risks for policymaking. The role of 'development' in this sense is building technological and scientific capacity and is at odds with the bottom-up and locally inclusive approaches adopted in DRR. Yet the impacts-based approach has dominated climate change adaptation management under the United Nations Framework Convention on Climate Change (UNFCCC) (Huq and Toulmin, 2006; Schipper, 2006; Ayers and Dodman, 2010).

This perception of adaptation is starting to change, driven largely by the development and disaster risk reduction communities. In 2002, a report released by ten leading development-funding agencies stated that climate change was a threat to development efforts and poverty reduction, including the achievement of the Millennium Development Goals, and that pro-poor development was key to successful adaptation (Sperling, 2003). The report reflects many of the themes emerging in the DRR and vulnerability literature on vulnerability at the time (e.g. Smit et al., 2000; Huq et al., 2002; Kates, 2009), including recommendations to support sustainable livelihoods, improve governance and make institutions more accountable and participatory (Sperling, 2003;

Klein, 2008). Since 2002, research and non-governmental organisation (NGO) communities have increasingly incorporated climate change within their development work, believing they have the skills, experience, local knowledge and networks to undertake locally appropriate vulnerability-reduction activities that increase resilience to a range of factors that include climate change (Ayers and Dodman, 2010).

This shift is particularly evident through the recently emerging discourse of community-based adaptation (CBA). CBA operates outside UNFCCC-led processes, starting at the community level to identify, assist and implement community-based development activities that strengthen the capacity of local people to adapt. Proponents of CBA suggest that done well, CBA presents an opportunity for shifting the balance of risk assessments back towards participatory, locally responsive adaptation planning (Jones and Rahman, 2007; Ayers and Forsyth, 2009). Other observers point to the relative infancy of CBA and the need for more critical engagement with the learning from grass-roots development and disaster-risk reduction about how to achieve meaningful participatory action (Dodman and Mitlin, 2011).

Although this shift towards more development-orientated climatic disaster response is relatively recent, this chapter proposes that in low-income contexts, the role of development in achieving resilience has been explicitly recognised, and several of the case studies in this book highlight this. This creates entry points for incorporating vulnerable people in making more holistic choices about managing disasters, improving their own adaptive capacity and moving away from impacts-focused and expert-driven decision making. In the remainder of this chapter, we use the book's case studies and two additional case studies to illustrate how attention to the role of development can provide entry points into more effective, inclusive planning for climate-related risk reduction.

21.3 Managing Disasters in Developed and Developing Country Contexts: A Review of Case Studies

The 'Impacts-Based' Approach to Risk Management in Developed Countries

This chapter has proposed that adopting an 'impacts-based' approach to managing risks can result in the sidelining of development-related or vulnerability issues in managing disaster responses and an over-emphasis on technocratic expertise in defining 'solutions'. This is well illustrated by the historical response to flooding in the Mississippi river basin, North America (Chapter 4). In this case, enormous amounts of financial and engineering resources have been poured into building then raising and extending a system of levees and flood protection systems on the floodplains of the Mississippi River starting as far back as the early 1700s. Yet with almost ridiculous regularity, flooding events overtop or breach these structures, causing widespread inundation, death and destruction. The key flaw here is that as quickly as the flood defences are increased, the river is further constricted, the floodplain further urbanised – counteracting any 'advancement' in flood protection. The approach highlights

an impacts-based approach and, in this case, one that has had limited success in real terms for the affected community.

Responses to windstorms/cyclones/hurricanes (Chapters 3, 9 and 11), in developed countries at least, are commonly technical engineering responses with a focus on building tolerance and event return periods. In the case of cyclone Tracy, a very successful adaptation of building regulations was evidenced. While the long-term results were highly successful, there were a number of important social issues that were not particularly well addressed, with some evidence that demographic changes in Indigenous populations may have resulted from the disaster (Haynes et al., 2011). In the case of hurricane Katrina (Chapter 3), it is clear that major social issues need to be addressed to reduce vulnerability in the future.

The Economist (2012) recently argued that the Dutch are reconsidering their philosophy of flood control through building ever-higher dykes to improving resilience. In the Room for River project, land use of vulnerable flood plains is being returned (in a planning sense) to floodplains through moving farms or raising buildings (*The Economist*, 2012).

We add one further case study example to our discussion. Following an unusually powerful thunderstorm in which 196 mm of rain fell in four hours at the head of a catchment, the small Cornish village of Boscastle suffered major damage. Government and Environment Agency officials framed the event as an indicator of climate change that could have severe implications for the future of the tourism industry. Based on this understanding, the Government commissioned external hydrological and climate systems experts to assess the impact of the flood and make a judgment on the appropriate solution. The resulting policy response was an expensive, highly technical engineering intervention. In her review of the process, Jennings (2009) suggests many locals viewed the policy with scepticism and even derision. Jennings argues that from the perspective of Cornish residents, the 2004 flood was the result of inept government land management practices as much as it was extreme weather events. While local residents acknowledged the role of extreme weather events on their local livelihoods and economy, they felt that assumptions about the role of climate change overshadowed the more important historical and institutional factors that had led to their dependency on a climate-sensitive tourism industry (Jennings, 2009: 247). Jennings suggests that despite apparent widespread efforts to ensure participation in decision making around policy responses to the event, knowledge perceived as 'local' was subordinated in favour of externally generated expertise.

This final case study shows how an over-emphasis on the impacts of the hazard meant that the role of development in defining vulnerabilities was sidelined and participation in determining adaptive solutions was restricted. On the contrary, Jennings shows how greater attention to lay and non-expert experiences can reveal locally embedded understandings of perceptions and experiences of risk that can allow more locally relevant risk-reduction solutions (Jennings, 2009).

Disaster Risk Management in Developing Countries

A clear and disproportionate human toll is recorded for almost all the case studies of events occurring in developing countries in this book. Although it is almost impossible to compare individual events quantitatively, it is clear that in developing countries, natural disasters often result in deaths on the order of several thousand people rather than the hundreds seen in developed countries. Disaster response often relies on assistance and aid from foreign countries and NGOs. The geographical vulnerability of developing countries is discussed in the opening of this chapter, but also of great significance are poverty, education and physical vulnerability (e.g. shelter) to extreme events.

While vulnerability is clearly tied to poverty – regardless of the economic development status of a country – the response to disasters in developing countries is very different to that in developed countries.

Of the six case studies featured in this book, we identify several commonalities. First is the community-level response that builds resilience. In Mexico, for example, community-based industry (coffee production) can be a source of resilience – with a capacity for self-organisation and learning that is helping these farmers adapt their business and communities to disasters and change (Chapter 18). Similarly, in Sahel and along the Nile, Batterbury and Mortimore (Chapter 15) and Goulden and Conway (Chapter 19) all identify the building of resilience at the community level through self-organisation and diversity.

The second commonality of the case studies in developing countries is that in many of these cases, disaster creates an entry point for development-based and participatory approaches to disaster response. These opportunities are often missed in high-income contexts in which a greater expectation is placed on the government to repair damage and return to the status quo. For example, following cyclone Sidr, the Bangladesh Government sought to adopt a 'build back better' approach to disaster recovery (Chapter 17).

In a further example, discussed in Rahman and colleagues (2009), a community-based adaptation project in the increasingly flood-prone Char Islands of the Gaibanda District, Northern Bangladesh, focused on identifying what made these flooding events 'disastrous' rather than on the biophysical impacts. While the project is a good example of community participation, it does highlight some of the challenges. The project revealed the reduced reliability of traditional knowledge systems to deal with changed weather conditions. It also highlighted the challenge of communicating complex messages about climate and change to the community. In this case, the information was not always seen as relevant to the community.

These case studies demonstrate the value of taking livelihoods and development as the starting point and emphasising participation and local capacity building in designing climate disaster management strategies.

21.4 Discussion and Conclusions

While we have highlighted the success of bottom-up approaches in the case studies mentioned in this chapter, we acknowledge that this is not always the approach in developing countries, nor is it the only answer. Indeed, much adaptation planning in developing countries has been criticised for being equally top down, with an over-reliance on technical information at the expense of attention to the development-related factors that drive vulnerability (Burton, 2004; Schipper, 2007; Ayers, 2011).

Rather, we highlight cases in which development is taken as a starting point for building resilience to climate-related disasters. This provides an entry point for holistic and participatory approaches to vulnerability assessment and adaptation planning that is more likely to meet the needs of vulnerable people on the ground. We suggest that perhaps such approaches are more likely to be undertaken in low-income contexts for three reasons:

Firstly, development is perhaps a more obvious starting point in low-income contexts. Burton (2004) suggests that analysing vulnerable communities in low-income contexts would reveal an existing 'adaptation deficit', which is the existing capacity of many vulnerable countries and groups to cope with and adapt to *existing* climate risks and that any climate change adaptation program would need to reduce this deficit before those communities can adapt to future climatic changes.

The same is of course true in high-income contexts. A case in point is the devastation caused by hurricane Katrina in 2005 to New Orleans, which fell disproportionately on poor and marginalised communities. Following the disaster, there was widespread recognition of the apparent neglect of poor and/or African American citizens who tended to live in the areas most vulnerable to the flooding. Reports from the time suggested that any of the city's poor could not afford to heed hurricane warnings and flee before the hurricane struck (Chapter 3), making the disaster as much an issue of development as of the hurricane itself. And yet, part of the international outrage at the management of the disaster was precisely that Katrina exposed this kind of vulnerability in such a high-income country. Thus, development may not be an obvious starting point in developed nations, but it is nevertheless applicable.

Second, there is a long history of participatory development and disaster risk reduction in low-income countries. The importance of local participation in decision making around development interventions arose from a recognition that the managerial-style approaches of the 1970s and 1980s, dominated by professional expertise and bureaucratic control, were failing to achieve significant improvements in the livelihoods of the world's poor (Cornwall, 2000). Such observations gave rise to a 'participatory turn' in development studies and practice, emerging from the NGO community but rapidly being taken up by government and international development agencies (Williams, 2004). The trend towards more participatory approaches to development

has resulted in decades of research and advocacy into locally inclusive approaches to doing development and managing disasters. Climate-related disaster management in both high- and low-income contexts would do well to draw more lessons from this experience, but perhaps the parallels are more easily made in developing countries, where the participatory development history is stronger.

Thirdly, technological and financial capacity is greater in higher-income contexts. This drives a tendency towards technical assessment and high-cost infrastructure-based solutions that are simply not an option in some low-income contexts. We have argued that prioritising high-tech, high-scale and high-cost solutions risks missing the factors that undermine adaptive capacity or risk providing a solution to the wrong problem (Handmer, 2009).

Responding to climate-related disasters may in some cases represent a practical means of achieving sustainable development – with good (i.e. sustainable) development policies and practices bolstering adaptive capacity and adaptation to climate change often meaning good development (Huq and Ayers, 2007).

Of course, critics of this approach may suggest that the role of hazards in defining risk could become too marginalised, proving problematic particularly for practical issues of governance and finance. If climate change adaptation is simply good development, what makes it adaptation? Importantly, it is argued that much existing development will become unsustainable under changing climatic conditions, so 'development as usual' is not enough in light of a changing climate context. For example, investing in roads and communication infrastructure in coastal areas would encourage settlement in those areas; however, sea-level rise may mean that such settlements will be untenable in the long term. So there is an important process of ensuring that the vulnerabilities of development as frequently evidenced in the case studies of developed countries in this book (e.g. urbanisation of floodplains) are not repeated in a development approach to adapting to climate change.

It is not proposed here that all climate-related disaster management is development; but it is suggested that it is the development context that determines how 'disastrous' a climate hazard turns out to be. Development does not cause disasters, but it certainly has a key role in defining them. As such, while development is not the same as disaster response, it is a good place to start.

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