

UNDERSTANDINGS IN DISASTER RISK REDUCTION AND RESILIENCE

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Keywords: disaster, risk, reduction, livelihoods, resilience, vulnerability, shock, stress, urban, assets

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Summary

Disasters are anything but natural. Much can be done to reduce the risk of large scale disasters exacting high death tolls and causing extensive damage. Central to the understanding of disaster risk reduction (DRR) are the separation of the naturally-induced phenomenon, e.g. earthquake or cyclone from man-made vulnerability; and that most disasters are cyclical in nature, i.e., they are likely to reoccur, meaning that actions can be taken to reduce their severity.

Good disaster risk reduction measures begin with vulnerable populations, i.e., they put people in the middle. Building up skills and abilities and strengthening governance are vital for successful DRR.

Current efforts in DRR are complemented by new thinking concerning resilience, which seeks to unite a range of activities towards communities ‘bouncing back better’ after a disaster. Resilience and DRR actions are currently being applied in particular to the

growing phenomenon of increased urban vulnerability, for which many actors are ill-prepared.

1. Introduction

When the 7.8 on the Richter Scale earthquake struck Haiti on January 12th 2010 it left, according to the Government of Haiti, some 316 000 people dead and left well over one million people homeless. Haiti beforehand however was already in a state of chronic crisis: as the poorest country in the western Hemisphere it had suffered from weak governance for decades, short cycles of other naturally-induced disasters (cyclones, landslides), and massive environmental degradation.

Six weeks after the Haiti earthquake, on 27th February 2010 an earthquake measuring 8.8 on the Richter Scale struck the South American country of Chile, killing some 550 people and damaging over 350 000 homes.

While recognizing some differences between the earthquake's attributes (for example, Chile's earthquake was 21 miles deep and Haiti's was 8 miles deep), what is remarkable are the scales of devastation compared to the size of the earthquake: while Chile's earthquake was over 500 times more powerful than that that struck Haiti, the death toll was less than 0.2% of those killed in Haiti.

Why is this? The reasons involve the degrees of preparedness and vulnerability within each country, which are inextricably linked to the levels of wealth and poverty: while Chile is ranked at 44 in the 2011 Human Development Index (a measure of relative wealth of nations based on people-oriented indicators, such as wellbeing), Haiti is way behind at 158 out of 187 countries (indeed, since the earthquake the country has slipped further down).

Disasters are therefore anything but natural – central to an understanding of effective disaster risk reduction (DRR) concerns the complex social, political and economic dynamics that determine how well a country is able to withstand disaster.

2. What Is Disaster Risk Reduction (DRR)?

'Today, disaster risk management is considered to be a constantly evolving and integral paradigm that not only incorporates most of the different trends and perceptions mentioned above, but is also indispensable for cost-effective development and sustainable poverty reduction'.

- Wamsler, 2005, 17

Large scale disasters in the first half of the last decade, such as the 2004 Asian tsunami, 2005's Hurricane Katrina and the 2005 Kashmir earthquake pushed disaster management to the top of the agenda of many donors and aid agencies (La Trobe 2005; Wamsler 2006). More recently, in 2010, disasters accounted for the deaths of some 270 000 people and caused US\$10 billion in damages (DFID, 2011, 4). If the development discourse of the preceding decade had been dominated by conflict and its resolution,

then this decade has been marked by the rapid development of disaster risk reduction, commonly known as DRR.

DRR is defined by the UK Government's Department for International Development (DFID) as 'policies and practices to minimize (with a view to longer-term prevention) disaster losses' (DFID, 2004, 17). DFID names three 'broad areas for interventions': hazard minimization (where possible); reducing exposure and susceptibility; and enhancing coping and adaptive capacity.

In addition to high profile disasters, a second important driver for DRR's growth is engagement from aid agencies and aid donors over climate change, wherein DRR offers approaches that directly deal with climate changes' visible consequences among vulnerable populations, e.g. increased flooding in Bangladesh, vulnerable coastal communities.

The 2007 conference 'Making disaster risk reduction work' organized by the ProVention Consortium, a longstanding grouping of leading NGOs and think tanks concerned with DRR, argued that 'Increasing the political space for urgent action can also benefit ... climate change, a global agenda with high visibility, can provide a strong impetus to engage in building more resilient communities to natural hazards. In the same vein, disasters are actual visible and tangible challenges for countries and communities, while climate change may be perceived as a distant problem' (ProVention, 2007, 12).

Significantly, DRR is positioned by many lead agencies within the context of development. This is evidenced by many of the titles of recent agency publications and toolkits, such as UNDP's 2004 global report *Reducing disaster risk; a challenge for development* and Tearfund's 2005 toolkit *Mainstreaming disaster risk reduction: a tool for development organizations*.

An increasing literature base for DRR is also being provided from Asia, notably Japan (following the 1994 Kobe earthquake and more recently the 2011 earthquake and tsunami) and India, following in large rapid onset disasters in Latur (1993), Orissa (1999) and Gujarat (2001). Recent work includes Neekhra's study of growing vulnerability in slums in India (Neekhra 2008) and a review of coping mechanisms for urban disaster management (Mekvichai 2008). Think tanks such as the Overseas Development Institute (ODI) have published a good practice review (Twigg 2004), while the Red Cross (2002) and UNDP (2004) regularly advocate enhanced DRR within development.

2.1 Three Models for Understanding Disasters

This section presents three approaches for understanding and explaining DRR. The first two emerge from disaster management, and are the Pressure and Release (or crunch) model (Blaikie et al, 2004), and the Cycle of disaster. The third model, which emerged from developmental approaches to chronic poverty, is the livelihoods approach (Chambers and Conway, 1991).

2.1.1. The Pressure and Release Model: Describing Disaster using Vulnerability and Hazard

'There is no such thing as a natural disaster'

- Wamsler, 2007, 15

A central debate within disaster management literature since the 1980s has been that of the nature of vulnerability and its role in natural disasters (Cuny, 1983; Twigg, 2001; Wamsler 2007; Benson and Twigg, 2001; Blaikie et al, 1994; Davis, 1978). Natural disaster can be defined as 'a serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses' (UNISDR, 2009).

In this definition, the serious disruption is caused by more than the phenomenon itself, such as a volcano or an earthquake. A vulnerable situation is also required. Hence a volcano erupting on a deserted island in Hawaii can be a beautiful spectacle; however a volcano erupting on the small populated island of Montserrat, causing damage to property and lives, is, for those whose lives are adversely affected, a disaster.

Vulnerability can be defined as 'a condition or set of conditions which adversely affect people's ability to prepare for, withstand and/or respond to a hazard' (Warmington 1995, 1). Within this definition, the focus is not on the phenomenon but on people, and their ability to deal with the onset of a natural phenomenon in advance of, during and immediately after its occurrence.

This understanding of vulnerability is given form in the Pressure and Release (PAR) model, developed in the 1980s and described in detail by Blaikie et al in the 1994 seminal text *At Risk: natural hazards, people's vulnerability and disasters*. The PAR model is based on the simple formula:

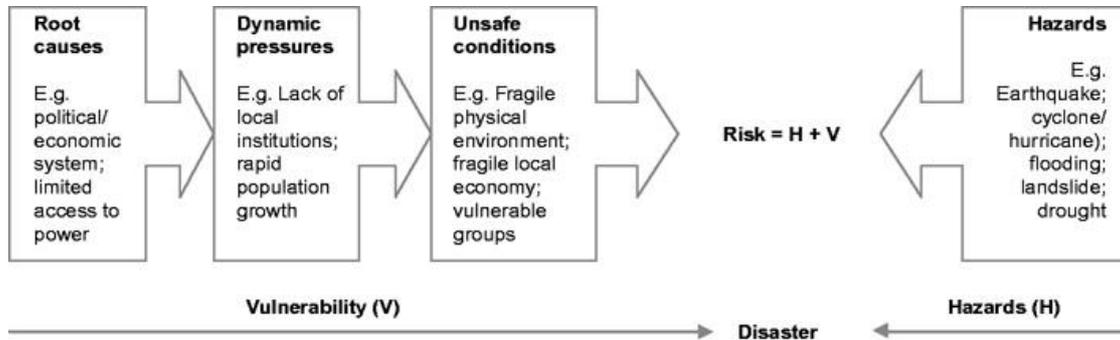
Disaster = Hazard + vulnerability

The PAR model, illustrated in figure one below, comprises two elements: the pressure model, i.e. the causes of disaster for a particular hazard; and the release model, i.e. measures that can be taken to reduce or avoid the disaster occurring. Vulnerability is disaggregated into three elements representing the progression of vulnerability: unsafe conditions (immediate manifestations of vulnerability); dynamic pressures (the cause of the unsafe conditions); and the underlying causes (i.e. the fundamental 'roots of the problem').

By including underlying causes, the model seeks at each stage to prompt the question 'why?' to the causes of a disaster. For example, as Sálvano Briceño, the then Head of the United Nations International Strategy for Disaster Reduction (ISDR), succinctly stated after the Haiti earthquake, 'It's poverty that is at the core of these disasters.'

Used as a tool of analysis, the 'underlying causes' opens the door to discussions of systemic societal issues as a basis for vulnerability (Maskrey 1989). The release aspect

of the model can also be used to propose interventions to ‘reduce the pressure’ of a disaster.



Source: Adapted from Blaikie *et al.* (1994)

Figure 1. The Pressure and Release (PAR) Model Source: Soares, M., Gagnon, A., Doherty, R. (2012) ‘Conceptual elements of climate change vulnerability assessments: a review’, *International Journal of Climate Change Strategies and Management*, Vol. 4 Issue: 1, pp.6 – 35

The model is helpful above all in serving to separate the natural phenomenon from vulnerability – natural disasters are therefore anything other than natural. The model however is limited: in disaggregating vulnerability into three components the model prompts the headlines rather than the full story. Recognizing this, Blaikie et al (1994, 46) state that the PAR ‘exaggerates the separation of the hazard from social processes in order to emphasize the social causation of disasters’. To these ends they developed the companion ‘Access model’ in order to describe the nature of vulnerability in relation to access to resources.

2.1.2. Linking Relief to Disaster Mitigation and Preparedness: The Cycle of Disaster

‘Linking relief and development is by no means a mainstream concept, and remains experimental.’

- Herbinger, cited in Buchanan-Smith and Maxwell, 1994, 1

Linking relief to actions to reduce is important for good DRR – often aid funding streams dry out after the initial ‘relief surge’ following a disaster, when there is a need to consolidate recovery and improve chances for enduring risk reduction measures. The work of Anderson and Woodrow in the mid to late 1980s sought to mainstream the link between short term response to disasters and longer term, developmental actions to reduce vulnerability. Buchanan-Smith and Maxwell (1994, 1) describe this ‘virtuous circle’ as follows: ‘Better ‘development’ can reduce the need for emergency relief; better ‘relief’ can contribute to development; and better ‘rehabilitation’ can ease the transition between the two’.

A key element for linking relief to development concerns actions taken prior to a

disaster, known as disaster mitigation and preparedness (DMP). Twigg et al (2000, 2) provide the following definitions for these terms:

- Mitigation provides the overlap with development: both concern long term endeavors at improving quality of life. For example, a masons' training program in an earthquake prone area aimed at building skills and knowledge for seismic-proof construction would be both a mitigation measure (to prevent building collapse) and a developmental activity (improving the overall quality of buildings and building skills among masons)
- Preparedness is defined as 'any action to minimize the impact of a disaster. This ranges from physical measures such as flood defenses or reinforcing buildings to non- structural measures such as training, land use regulations, legislation, economic mechanisms and raising public awareness. Mitigation can take place at any time before, during or after a disaster'. Preparedness is defined as 'specific measures taken before disaster strikes, usually to forecast and warn against disasters, take precautions when they threaten, and arrange for the appropriate response (e.g. organizing evacuation procedures, stockpiling food supplies, and training and equipping rescue services).'

DMP came to particular prominence in the 1980s following a succession of high profile disasters throughout that decade (Twigg et al, 2000, 17). In 1987 the UN General Assembly assigned the 1990s as the United Nations International Decade for Natural Disaster Reduction (IDNDR). The resolution noted that 'in the previous 20 years natural disasters had claimed 3 million lives, affected at least 800 million people and caused immediate damages of over \$23 billion' (UN General Assembly 1987, cited from Twigg et al, 2000, 17).

DMP is often described in relation to other stages of a disaster through the Cycle of disaster model (Blaikie et al, 2004; WHO 2002). The Cycle, illustrated in figure two, describes the sequence of aid interventions following a rapid onset disaster. The sequence comprises immediate relief, followed by recovery and rehabilitation. The mode then shifts towards preparing for a disaster for the next time it happens, hence the Cycle of disaster.

This model has found resonance among many practitioners (Tearfund, 2004) and is frequently used as a way of explaining the stages of post disaster recovery, and for highlighting mitigation and preparedness. It clarifies the stages of disaster and enables aid agencies to plan accordingly.

Concerning vulnerability, the implicit assumption is that good recovery will lead to preparedness and mitigation, i.e. activities that reduce vulnerability. The cycle also serves to indicate that, unless preventive measures can be taken to stop a disaster from occurring together, a disaster is sooner or later likely to occur.

The Cycle however has its critics. Research undertaken by Twigg (2000, 29) found that, of 62 aid practitioners interviewed on their understandings of the Cycle, 'All those who talked about it, or about the supposed differences between the various stages of relief,

rehabilitation, development and mitigation, felt that in reality there was (neither) a clear distinction between stages’. As one interviewee stated, ‘There are no boundaries between relief and development. It’s not a continuum and it’s not linear. You have emergency situations within ongoing development, and you need to use emergency response to promote long-term development, so the two are embedded in each other’ (Twigg, 2000, 30).

The disaster cycle

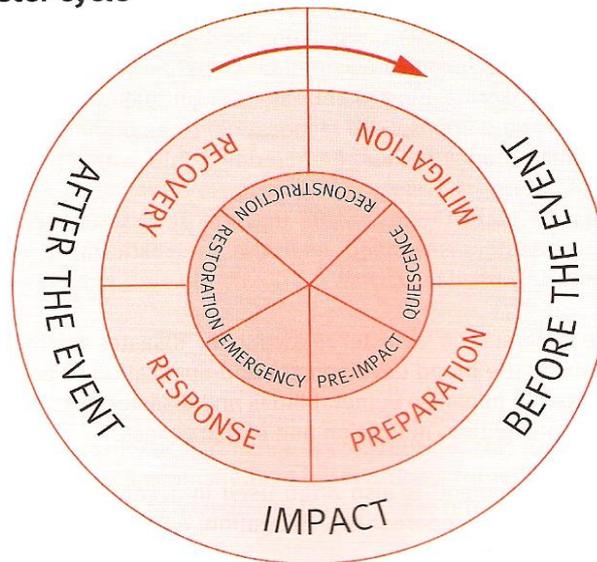


Figure 2. The Cycle of disaster (2004) Source: Twigg (2004) Disaster Risk Reduction: mitigation and preparedness in development and emergency programming

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Biographical Sketch

David Sanderson trained and worked in architecture before taking a Masters degree in Development Practice at Oxford Brookes University in 1991. Since then he has undertaken project management, training, research and consultancies in development and emergencies in over 30 countries in Africa, Asia, Latin America, Europe and the Caribbean. Between 1992-94 David was a Research Associate at Oxford Brookes University's Centre for Development and Emergency Practice (CENDEP). From 1994-98 he worked as Project Manager at the Oxford Centre for Disaster Studies, focusing on disaster risk reduction. Between 1998-2006 David worked for the NGO CARE International UK, firstly as Senior Technical and Policy Advisor and Head of the Policy Unit (1998-02), and subsequently for four years as Regional Manager for Southern and West Africa, based in CARE's Regional Management Unit in South Africa. In 2006 David returned to Brookes to become CENDEP's Director and Programme Leader for the Masters degree in Development and Emergency Practice (DEP). In this role David has undertaken professional engagements in Haiti, India, Bangladesh, China, South Africa, Qatar, Japan and Pakistan. He completed his PhD by published works in 2009, which brought together research and practice undertaken between 1995-2008 concerning urban risk and poverty, and was conferred Professor in 2010. David's professional experience lies in urban poverty, disaster risk reduction and livelihoods. He has undertaken work for the UK Government's Department for International Development (DFID), the Qatar Foundation, ALNAP, ELRHA, Disasters Emergency Committee (DEC), European Commission (DiPECHO, EC), United States Agency for International Development (USAID), World Bank (EDI Section), United Nations (UNDP/UNDESA), Action by Churches Together (ACT), British Council, Christian Aid, Tear Fund and the Mott Foundation. He sits on several NGO committees, teaches courses in Spain and Switzerland, and is a Visiting Professor at Université Paris-Est Créteil, France.