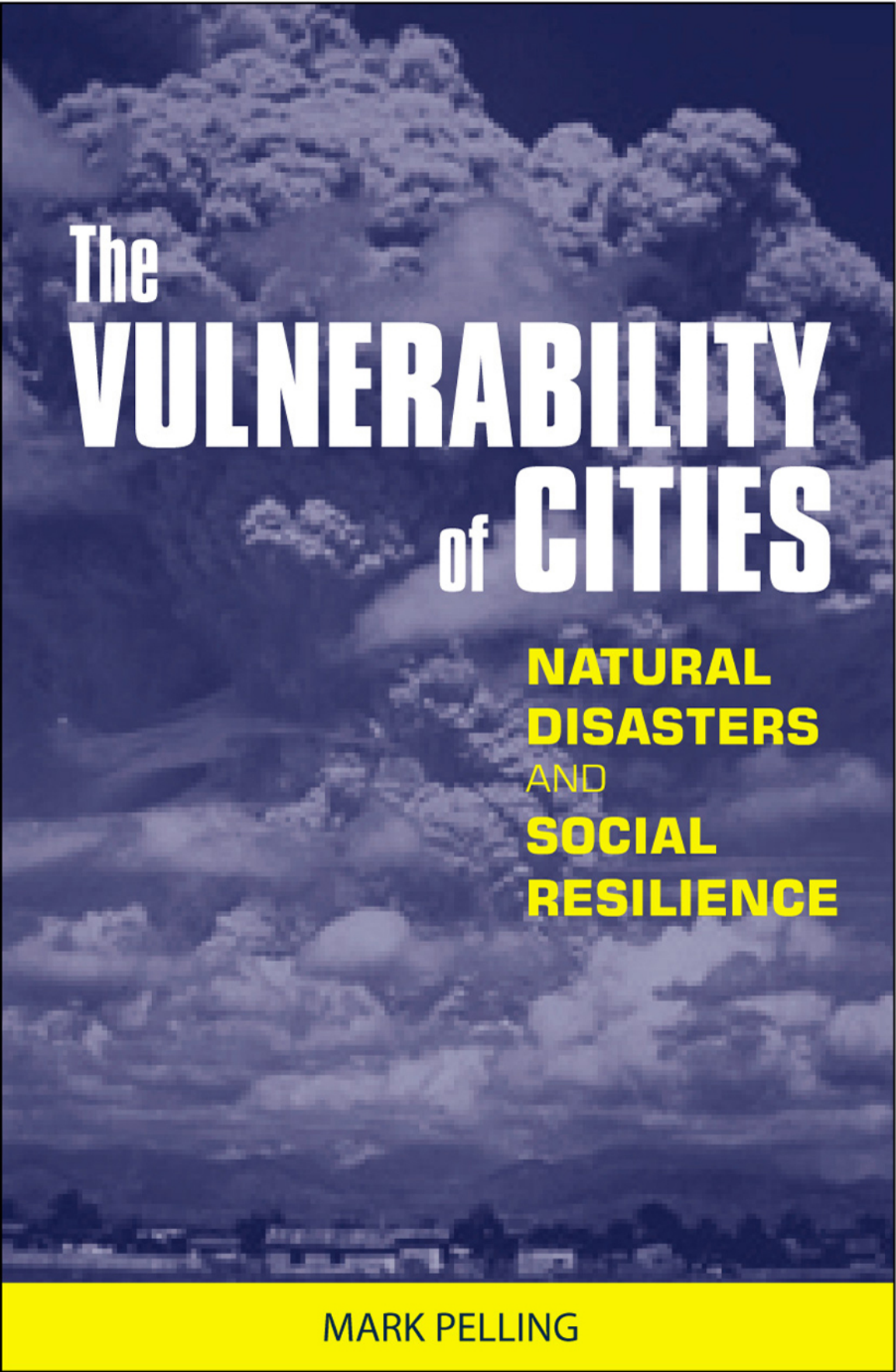




The **VULNERABILITY** of **CITIES**

**NATURAL
DISASTERS
AND
SOCIAL
RESILIENCE**

MARK PELLING

The Vulnerability of Cities

For Ulli

The Vulnerability of Cities

Natural Disasters and Social Resilience

Mark Pelling

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List of Acronyms and Abbreviations

ACHR	Asian Coalition for Housing Rights
ADN	Ayuntamiento Distrito Nacional (Dominican Republic)
AMDEM	Asociación de Mejoramiento y Desarrollo de Los Manguitos (Dominican Republic)
ANDA	Albouystown Neighbourhood Development Association (Guyana)
AUDP	Asian Urban Disaster Mitigation Program
B\$	Barbadian dollars
BBC	British Broadcasting Corporation
BECT	British Earthquake Consortium for Turkey
BLP	Barbados Labour Party
CARE	Cooperative for Assistance and Relief Everywhere (<i>formerly the Cooperative for American Remittances to Europe</i>)
CBO	community-based organization
CDB	Caribbean Development Bank
CDC	Civil Defence Commission (Guyana)
CDERA	Caribbean Disaster Emergency Response Agency
CDRC	Citizens' Disaster Response Center
CERO	Central Emergency Relief Organization (Barbados)
CHPA	Central Housing and Planning Authority (Guyana)
CIDA	Canadian International Development Agency
CONDIC	Comité Nacional de Desarrollo Integral Comunitario (Dominican Republic)
CPRME	Comisión Presidencial para la Reforma y Modernización del Estado
DCC	Disaster Coordinating Council
DDMC	Dominican Disaster Mitigation Committee
DERO	District Emergency Relief Organization (Barbados)
DFID	Department for International Development (UK)
DR\$	Dominican dollars
DRC	Dominican Red Cross
ECHO	Humanitarian Aid Office (European Commission)
ESRC	Economic and Social Research Council
FCT	Future Centre Trust (Barbados)
FUNDASAL	The Salvadorian Foundation for Development and Basic Housing

GCC	Georgetown City Council (Guyana)
GDP	gross domestic product
GGG	Good and Green Guyana
GNP	gross national product
GRC	Guyana Relief Council
GS&WC	Georgetown Sewerage and Water Commissioners
HIV/AIDS	human immunodeficiency virus/acquired immunodeficiency syndrome
IDAC	Instituto de Acción Comunitaria (Dominican Republic)
IDDI	Instituto Dominicano de Desarrollo Integral (Dominican Republic)
IFI	international financial institution
IFRC/RC	International Federation of the Red Cross and Red Crescent
IMF	International Monetary Fund
INGO	international non-governmental organization
IPCC	Intergovernmental Panel on Climate Change
LETS	local economic trading scheme
MOCUGRECA	Movimiento Cultural Gregorio Castillo
MP	Member of Parliament
NGO	non-governmental organization
ODA	Overseas Development Administration (UK)
ONAPLAN	Office of National Planning (Dominican Republic)
PAHO	Pan American Health Organization
PCW	Pinelands Creative Workshop (Barbados)
PDC	Pinelands Development Council (Barbados)
PLD	Dominican Liberation Party (Dominican Republic)
PNC	People's National Congress (Guyana)
PPP	People's Progressive Party (Guyana)
PRD	Dominican Revolutionary Party (Dominican Republic)
RADIUS	Risk Assessment Tools for Diagnosis of Urban Areas Against Seismic Disasters programme (United Nations)
SAP	structural adjustment programme
SIMAP	Social Impact Amelioration Programme (Guyana)
SDVC	Support Disaster Victims Campaign
SPARC	Society for Promotion of Area Resource Centre
SPSS	Statistical Package for Social Scientists
UCOREBAM	Unión Comunitaria para la Recogida de Basura del Barrio Los Manguitos (Dominican Republic)
UN	United Nations
UN-HABITAT	United Nations Human Settlements Programme (<i>formerly</i> UNCHS (Habitat))
UNCHS (Habitat)	United Nations Centre for Human Settlements (<i>now</i> UN-HABITAT)

UNCRD	United Nations Centre for Regional Development
UNDRCO	United Nations Disaster Relief Coordinator
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNICEF	United Nations Children's Fund (<i>formerly</i> United Nations International Children's Emergency Fund)
UNPD	United Nations Population Division
UK	United Kingdom
USA	United States of America
USAID	United States Agency for International Development
WCED	World Commission on Environment and Development
WHO	World Health Organization
WRI	World Resources Institute (USA)
YMCA	Young Men's Christian Association

Section I

Cities and Environmental Risk

Chapter 1

Tracing the Roots of Urban Risk and Vulnerability

INTRODUCTION

On 10 July 2000, 300 people were killed by a landslide in Manila, the Philippines. A shameful and avoidable loss, but just one from a growing list of urban disasters with a natural trigger. The event stands out because the landslide was not of soil, rocks or mud but of solid waste. This was truly an urban disaster. The disaster occurred in a squatter settlement, home to 300,000 people. The squatters lived on and around the Payatas rubbish dump, which takes garbage from Manila's 10 million inhabitants. The landslide and the response of survivors to it help in showing some of the fundamental characteristics of urban risk and vulnerability in Africa, Asia and Latin America and the Caribbean. First, it reminds us that urban areas are not immune to the forces of nature, which are more often associated with risk in rural communities. Second, it illustrates that it is communities of the poor and marginalized that face living with the greatest threats to health and livelihood from natural disaster, as well as having to cope with everyday risks from living and working in hazardous environments.

Responses to the Payatas landslide highlight the way in which the political–legal regime of a city can shape the capacity of different actors to cope with disaster impacts. The city government had in the past given up to US\$200 to the families of victims of disaster – an appallingly low value to place on a human life, and hardly sufficient to replace the potential economic contributions to the household of an active household member. Knowing the city government's past record, relatives of victims pre-empted a statement from the city authorities by demonstrating outside the court in Quezon City, Manila. After some time, and with support from human rights lawyers, the survivors filed a US\$20m legal claim against the city government for compensatory and moral damages based on the assertion that the city authorities were responsible for managing the Payatas dump. That the low-income victims of an urban disaster could launch such a well-orchestrated response relied upon specific kinds of social organization and legal rights in the city – basic conditions that are absent in some cities, and exceeded in others.

It is the objective of this book to explore the social attributes of at-risk communities and cities and examine the ways in which these assets shape human vulnerability to disaster. In Manila a long tradition of civil society organizing at the city and national levels provided a resource of human rights lawyers. Amongst community members experience of grassroots organizing and community-based self-help had fostered the skills necessary for leaders to organize community-level protest. More generally, it is a reflection of the relative power of civil society compared to the state, and of the attributes of the political–legal regime in place in Manila, that criticism of the state was allowed to be voiced by the survivors of the Payatas disaster, that open reporting of the event was possible in the press and that compensation could be discussed in a court of law.

In the course of the book we hope to go some way towards explaining why, at the beginning of the 21st century, urban areas in so-called developing countries appear to be increasingly affected by environmental risk. Environmental risk in the city is interpreted as an outcome of the political interests and struggles over power that shape the urban environment and society. As Harvey argues, ‘all ecological projects (and arguments) are simultaneously political–economic projects (and arguments) and vice-versa. Ecological arguments are never socially neutral...’ (Harvey, 1993, p25).

We will need to examine how power makes certain social groups within the city, and collectively, certain cities, more disaster-prone than others. Two expressions of power need to be considered: the material and the non-material (Braun and Castree, 1998). An example of a material expression of power is the contrasting ability of different actors to purchase land or secure housing in the city, with consequences for place of residence and access to basic services. Non-material expressions of power have been explored through discourse analysis, which argues that power resides in the control of ideas rather than things because it is ideas that shape the way in which things are used (Haraway, 1997). Examples of this form of ideological competition include contrasting perceptions of the role of and reason for participatory development approaches. Is participation a tool to facilitate grassroots empowerment and the transfer of skills to grassroots actors to challenge the status quo, or a mechanism to encourage grassroots actors to contribute labour in development projects and to undertake responsibility for maintaining new infrastructure to increase cost efficiency and project sustainability for funding agencies? To understand the geography of risk in the city we need to tackle both material and discursive forms of power. We need to identify the sources and uses of power that direct the distribution of resources in the city, and to understand this we need to be aware of the ideological positions of dominant actors in the city that justify decision-making for resource distribution.

SUSTAINABLE DEVELOPMENT, DISASTER AND THE CITY

Both disaster studies and urban studies are notoriously multi-disciplinary, and words often have multiple meanings. Box 1.1 provides definitions for some key terms.

Identifying disaster

The difficulty of disentangling natural hazards from other sources of threat to life and livelihood – especially from technological hazards and social hazards of violence and war – is frequently commented upon by disaster researchers (Burton, Kates and White, 1993; Blaikie et al, 1994; Tobin and Montz, 1997; Mitchell, 1999). The utility of an approach that singles out individual threats to humanity is greatest for research and policy that seeks to understand and mitigate a single type of physical process, but is reduced for work oriented towards understanding and intervening in human responses to hazard threats. As work on disasters over the last ten years has increasingly focussed on issues of human vulnerability and resilience, the more integrative approach has gained favour (White et al, 2002). Here, hazards are defined as ‘human ecological interaction that can generate disaster’ (Mitchell, 2001, p87). What constitutes a disaster is discussed in more length below, but clearly the term can operate at different scales. As the example from the Patayas landslide demonstrated, an event leading to a single casualty or death can become a disaster for any

Box 1.1 *Key terminology*

Risk: To be threatened by harm. To be at risk is to be under threat of harm.

Hazard: The potential to harm individuals or human systems. In this work, hazard is ascribed to natural, physical or environmental elements. It can be everyday (scarcity of clean drinking water) or episodic (volcanic eruption).

Vulnerability: Denotes exposure to risk and an inability to avoid or absorb potential harm.

Physical vulnerability: Vulnerability in the built environment.

Social vulnerability: Vulnerability experienced by people and their social, economic and political systems.

Human vulnerability: The combination of physical and social vulnerability.

Resilience: The capacity to adjust to threats and mitigate or avoid harm. Resilience can be found in hazard-resistant buildings or adaptive social systems.

Disaster: The outcome of hazard and vulnerability coinciding. Disaster is a state of disruption to systemic functions. Systems operate at a variety of scales, from individuals' biological and psychological constitutions or local socio-economies to urban infrastructure networks and the global political economy.

dependants of the person who has been injured or killed. At an urban scale, disasters are events of sufficient enormity to cause disruption to the urban system. This can be measured in a number of ways.

A common indicator of urban disaster is for the number of victims in proportion to the total population to be high, though there is no universally accepted ratio (Cross, 2001). Problems of data quality, particularly for historical events, limit the applicability of this approach (Pelling and Uitto, 2001). If 'impacted population' is used rigorously as a definition of disaster then the problem of proportionality will cause many small events in large populations to be hidden (Mossler, 1996). This is the case in large cities where events may directly impact on only a small proportion of the urban population compared to smaller urban centres, or where many small events may have a large cumulative impact but be overlooked by municipal or national authorities and international actors. An alternative measure of urban disaster may be to include only those events that have been felt to impact upon and cause dislocations within the 'urban system'. Within this we might include the economic functions of the city, its political regime and infrastructural integrity. Indicators for economic impact could include fluctuations in urban income, local rates of inflation and unemployment and the contribution of urban activities to national gross domestic product (GDP). Changes in political and social organization could be indicated by changing crime rates or periods of military control. Infrastructural integrity might be indicated by the number and proportion of, amongst other things, dwellings, industrial premises, hospitals, schools, sewers, roads and electricity cables etc destroyed or damaged by an event. For individual events much of this kind of data is available, but for the majority of cases it is not, again limiting the usefulness of this approach. A third source of definition might be to include only those events that have been recognized as disasters by a third party, be this a national government, municipality or international organization. This approach avoids the need for quantitative data but is open to political distortions where agencies might want to suppress or exaggerate the importance of an event (Albala-Bertrand, 1993). A deeper problem with these definitions of disaster is their failure to recognize the cumulative impact of small impact events. This is discussed below, but it should be noted here that cumulative disasters, including for example localized landslides or flooding, traffic accidents or the impacts of air pollution, cause more death and incapacitation in the city than larger scale events (Hardoy et al, 2001). To a great extent, therefore, fuzziness in the definition of disaster is less of a weakness than it may first appear.

The coevolution of urbanization and risk

Environmental risks, including chronic and catastrophic forms of 'natural disaster', occur as part of the development process (Hewitt, 1983; Castree and Braun, 2001). More than this, natural disasters are signifiers of the inequalities that underpin capitalist (and alternative) development, of unsound and

manifestly unsustainable human–environment relations. With specific reference to mega-cities, Mitchell (1999) describes how urban disasters are not amenable to technological quick fixes alone, and rather that the nature of disaster risk is constantly being redefined as changes to urban landscapes and socio-economic characteristics unfold. Urbanization affects disasters just as profoundly as disasters can affect urbanization.

Norgaard (1994) describes the pattern of changing human and environmental processes acting in one place as coevolutionary. The metaphor of an evolving biological system is useful. Here, there is no simple one-way line of causality in the production of human or environmental conditions: ‘nature’ does not cause ‘natural disasters’; rather risk in the city is an outcome of a myriad of feedback loops and thresholds and competing ideas, mechanisms and forms. In this way, the breaching of a critical threshold – perhaps by a relatively minor initial event – can initiate a cascading series of knock-on effects with wide repercussions throughout the urban system. The rate of change can be fast or slow, with catalysing events, such as catastrophic disaster or political reform, sometimes altering the context in which the combined human–environmental system operates. This creates space for rapid adaptation and hidden or new forms of human and/or environmental organization to evolve and rise to prominence – for a new equilibrium to establish itself before the next upheaval. There is of course no guarantee that successive periods of equilibrium will mark out a march towards progress, with backsliding and loss of human and environmental assets being as likely an outcome as the developmental progress that has been assumed in the post-Enlightenment era.

An example of a threshold-breaching event, which threatened to disrupt the stability of an urban system, comes from Metro Manila. Here, a small earthquake put one small section of the track of the city’s 15km light rail system out of alignment. This minor failure caused the system to be closed for a number of days and reduced its overall capacity for several months, putting more traffic onto the road network and creating knock-on problems (Solway, 1994). In contrast, Webber (1990 in Cross, 2001) explains how the collapse of the Oakland expressway and the closure of the San Francisco Bay Bridge following the Loma Preta earthquake did not lead to disruption of the San Francisco Bay Area’s transport system because of a high degree of redundancy in the metropolitan transport network. These examples highlight one way through which systems can be designed to have resiliency to unanticipated change such as natural disaster shocks.

The idea of resiliency suggests a proactive stance towards risk. It has been discussed within ecological theory, systems analysis and disaster studies (Tobin and Montz, 1997). Barnett (2001), in an analysis of policy responses to the uncertainty of climate change, draws on Wildavsky (1988) to identify six principles of resilient systems (see Box 1.2).

The local effects of global environmental change and economic, political and cultural globalization are adding greater uncertainty to development

Box 1.2 *Wildavsky's principles of resilient systems*

- *The homeostasis principle.* Systems are maintained by feedbacks between component parts which signal changes and can enable learning. Resilience is enhanced when feedbacks are transmitted effectively.
- *The omnivory principle.* External shocks are mitigated by diversifying resource requirements and their means of delivery. Failures to source or distribute a resource can then be compensated for by alternatives.
- *The high flux principle.* The faster the movement of resources through a system, the more resources will be available at any given time to help cope with perturbation.
- *The flatness principle.* Overly hierarchical systems are less flexible and hence less able to cope with surprise and adjust behaviour. Top-heavy systems will be less resilient.
- *The buffering principle.* A system which has a capacity in excess of its needs can draw on this capacity in times of need, and so is more resilient.
- *The redundancy principle.* A degree of overlapping function in a system permits the system to change by allowing vital functions to continue while formerly redundant elements take on new functions.

Source: Barnett (2001)

planning in general, and more specifically to the prediction and management of natural hazard and human vulnerability. Uncertainty amongst policy-makers comes from the increasing difficulty with which planning decisions can reliably be made based on extrapolating environmental hazard, human vulnerability and disaster experience from the past, when the physical and human conditions that contextualized past events are being re-shaped by local and global forces. Added to this, it is easy for local decision-makers working in agencies with limited financial and human resources to feel disempowered by the global scale of risk, that their ability to influence risk pressures is being undermined by their distance from, and the global scale of, sources of risk. When uncertainty and disempowerment are felt by decision-makers there is a danger that investment in disaster preparedness and mitigation will be left outside of urban development strategy, with disaster management reverting to a focus on post-disaster humanitarian relief and rehabilitation. Planners may well ask: 'How can we justify an investment in vulnerability reduction when we do not know beyond reasonable doubt the magnitude and frequency of future natural hazards nor the characteristics of populations at risk?', or question the effectiveness of local interventions into forces that are global in scale.

In such an atmosphere of growing uncertainty and reactive planning, dominant disaster mitigation tools based around physical engineering solutions to human exposure to hazard are becoming less attractive. The danger is that engineering-based solutions are not being replaced by alternative strategies, with

urban societies being allowed to live under the shadow of increasing risk. One way around this impasse may be to emphasize the social as well as the physical dimensions of risk. This is where Wildavsky's principles of resilience can help us. They point a way towards identifying an array of basic principles out of which alternative policy options for building resiliency to a whole range of stimuli – economic, physical, social etc – can be built. Returning to the six principles developed by Wildavsky (1988), particular characteristics of urban systems can be identified, support for which would build resilience in general and an enhanced capacity to cope with natural disaster shock in particular:

- Communications systems in the city. Information should flow freely between experts, policy-makers and citizens. Local knowledge and development priorities need to be identified and risks must be clearly communicated.
- Risks are greatest when functions are dependent upon a single resource. At the individual level, multiple livelihoods provide some resilience. For big business, developing contacts with a range of suppliers will help limit production delays following disaster.
- Local participation in decision-making through formal democratic structures and also by involvement in local development projects will maximize the benefit gained by citizens from development programmes and projects.
- Social surplus invested in buildings insurance, life insurance, social services or emergency services will be available at times of need following disaster.

Most of these practical outcomes of Wildavsky's account of resilience are already being pursued in cities of the global South. But they continue to be seen as responding to individual sectoral risks, so that ameliorating social vulnerability to environmental risk is divorced from vulnerability to economic or socio-political risks. The aim of placing Wildavsky's principles within the context of coevolution is to emphasize the range of fundamental policy options available to urban decision-makers that bridge the gap between disaster mitigation and mainstream development policy.

Whilst coevolution is a useful device for framing urban development and environmental risk, it is a difficult concept to operationalize. Data requirements would make a complete coevolutionary study of a city exorbitantly expensive. Despite this, some attempts have been made. In a study of coastal cities, Timmerman and White (1997) found that policy-makers were ill-prepared to study or plan at the interface between the built and natural environmental components of the city. Policy and planning institutions were orientated towards disaster response rather than preparation or mitigation. Citizens and firms who were in a position to respond to risk tended to react to perceived risk individualistically: the rich distanced themselves from hazard by accessing private water supplies, owning generators etc.

In a coevolutionary examination of vulnerability to coastal flood hazard in Vietnam, Adger (1999) identifies the historical progression of socio-physical periods of equilibrium and pays particular attention to the ways in which global climate change and market liberalism are re-shaping society and society–nature relations on this hazardous coast. These changes seem to be increasing overall human vulnerability to coastal flooding. More generally, and from a longer time-scale, the rise of urban ways of living and organizing can itself be thought of as an outcome of coevolution. As a coevolutionary process, urbanization is a mode of human organization producing new and unfixed sets of rules and constraints that shape the on-going interaction of humanity and the environment. Our interest is to examine how different forms of political organization in the city have shaped the capacity of local actors to move out of positions of vulnerability in relation to the environment, and the extent to which the rules shaping this capacity can themselves be changed to open more opportunities for coping with and mitigating environmental risk. A historical perspective will be needed to capture the thrust of coevolutionary change in the city.

Sustainable development and cities

‘If there could be such a thing as sustainable development, disasters would represent a major threat to it, or a sign of its failure’ (Hewitt, 1995, p155).

Despite Hewitt’s scepticism, the dominant discourse shaping the coevolution of urban spaces around the turn of the millennium has been sustainable development, and as components of this the ideas of participatory development and urban governance. It is incorporated here as a heuristic device for bringing together the different human and non-human elements that shape and are shaped by urbanization and risk.

Much of the literature on cities and development is limited by taking a weak sustainability approach (eg, World Bank, 2000). This sees cities primarily as engines of economic growth, where sustainable development is used to justify trends already well established in urban development. Support for the business-as-usual approach continues to be widespread, despite mounting environmental and social crises generated by the types of concentrated and extensive urban economic growth that result from this understanding of sustainability (Girardet, 1999).

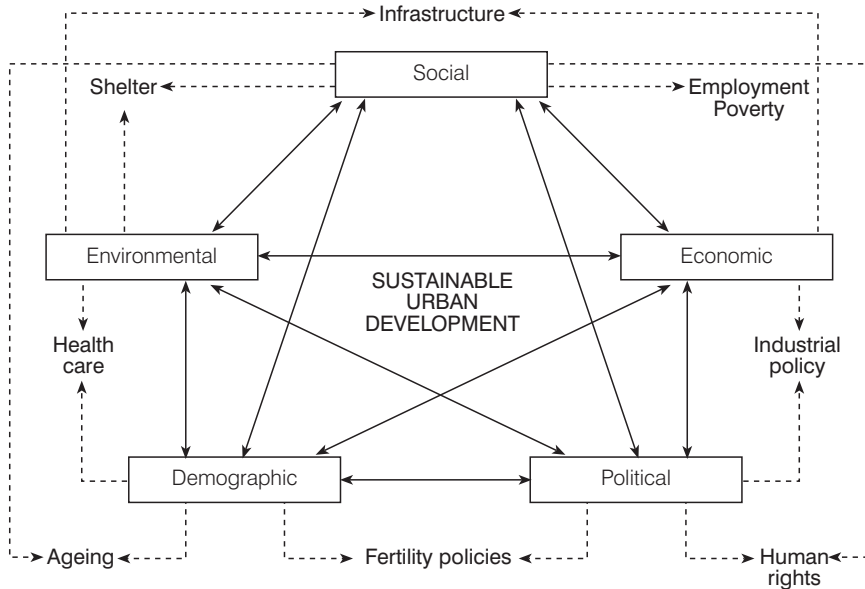
The business-as-usual approach has been challenged by a more ecologically centred perspective of the urban ecology school (Hardoy, Mitlin and Satterthwaite, 1992; Girardet, 1999). This group criticizes the linear metabolism of cities, where flows of raw materials (food, water, chemical and human energy, inventiveness) are turned into products (political power, manufactured goods and services, social and biological reproduction) and waste. Goods are drawn in from increasingly distant environments to satisfy the urban metabolism. The distance from which goods are acquired and to which wastes can be sent is

linked to the developmental stage of the city. For example, Mexico City's water metabolism draws from several different catchments. Through a system of canals, drinking water is drawn from up to 150km away (Connolly, 1999). Smaller and poorer cities will tend to draw on local hinterlands, the largest cities will draw upon a global market and contribute significantly to global environmental problems. The worst environmental problems are found in marginalized areas of poor or middle-ranking cities (recall the Payatas dump incident). Here local waste (rubbish, sewerage etc) accumulates together with waste from wider urban processes (industrialization, traffic) and even global trends (global climate change and sea-level rise) to create a treble burden of environmental risk for residents of these threatened places (McGranahan, Songsore and Kjellén, 1996; McGranahan et al, 2001). Add to this the greater susceptibility to natural disaster impacts experienced by those living in squatter settlements, tenement blocks or inner-city slums and the disproportionate weight of the environmental burden carried by the poor becomes clear.

The business-as-usual and ecological city approaches share two weaknesses. Neither adequately synthesizes the human and ecological imperatives of sustainable urbanization, and neither gives adequate weight to the social issues of poverty and human vulnerability (Pelling, 2001a). The fragmented vision of sustainable urbanization that these perspectives present allows gains in one area to generate losses elsewhere. A typical example is, as we saw above, for wealthy neighbourhoods or cities to export waste, simultaneously addressing local environmental concerns and causing more distant environmental degradation in low-income districts of the city or in the rural/global hinterland. Sustainable urbanization requires that urban systems be seen in a regional and global, as well as a local, context and that the components of urban development are viewed as an interacting whole.

The elements to be considered in such a holistic view of sustainable urbanization are shown in Figure 1.1. Five components are identified: social, economic, political, demographic and environmental. Some of the areas in which different sectors interact are shown, though there are many more that could be added. For example, the environment is linked to social development through local environmental quality and environmental justice – the ability of different social groups to access basic environmental goods, like shelter, and avoid the impacts of environmental hazards. This figure is useful in demonstrating the interconnectivity of the five components of sustainable urbanization and the need to place any policy to mitigate risk in the broader context of urban life as well as within larger regional and global physical and human systems (see Chapter 2).

There has been some criticism of the usefulness of this type of all-encompassing view of sustainable urbanization. McGranahan et al (2001) argue that in being confronted by a wealth of development issues and planning dilemmas, policy-makers are in danger of not seeing the policy wood for the contextual trees. This is a fair point, and there will always be a risk of sacrificing



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Figure 1.1 *Sustainable urbanization: main components and indicative issues*

analytical detail when using such a broad framework. But the greater danger is to overlook the fundamental inter-connectivity of the different components that shape the coevolution of urban settlements, and their relationships with the wider regional and global human and physical environments. The urban system is complex, and we need to be cautious of falling into the trap of reductionism.

If identifying the components of a more sustainable urbanization is proving difficult, then operationalization is no less problematic. Moving towards sustainable urbanization requires:

'seeking the institutional and regulatory framework in which democratic and accountable city and municipal authorities ensure that the needs of the people within their boundaries are addressed while minimizing the transferring of environmental costs to other people or ecosystems or into the future' (Satterthwaite, 1997, p1684).

Reorienting cities towards a vision of sustainability where environmental risk can be minimized places emphasis on the need for open and inclusive urban management set within a nested hierarchy of local, regional and international governance. Inside cities, municipal government occupies a pivotal position in its varied roles of service provider, community resource mobilizer, regulator, advocate and strategic planner. However, the capacity of municipal governments

has very often been limited by financial and human resource scarcity and, especially in capital cities, by the capture of municipal responsibilities (and budgets) by central government (Stren, 1989). Strengthening municipal authorities whilst broadening the base of urban governance by including civil society and private sector organizations should be a central concern for policy-makers (Dillinger, 1994; Abbott, 1996; Schübeler, 1996). At the beginning of the 21st century some movement has been made in this direction, with international agencies and international non-governmental organizations (INGOs) as well as some national and city-level authorities prioritizing the institutional strengthening of city governments, urban poverty alleviation, family planning and community development. But such programmes tend not to be designed or implemented as part of broader integrated strategies for sustainable urbanization and risk reduction (Pelling, 2001b). Despite this, it is possible to identify examples of best practice, and selected cases are discussed below and in more detail in Chapter 4.

ENVIRONMENTAL HAZARD AND THE CITY

The disaster cycle in an urban context

What is known about the interaction of human systems with environmental hazards comes mostly from studies of rural natural disaster. These suggest that disaster shocks are discrete phenomena with a more or less well-marked beginning and end. They are also perceived as sequential phenomena, with each event playing a role in the shaping of subsequent risks, hazards, vulnerabilities and ultimately disasters (Mitchell, 1996). A disaster cycle results. Here, on-going pre-disaster preparedness activities are at some time interrupted by a disaster warning, followed by a disaster event. Immediately after the disaster is a short emergency phase, followed by progressively longer periods concerned with restoring basic services and physical, social, economic and psychological reconstruction. Reconstruction should dovetail into the next round of mitigation and preparedness work as systems learn from the event by adapting to reduce the likelihood of future events. This is of course an idealized model. In urban systems all phases of the disaster cycle may be experienced simultaneously in different parts of the city. This may be because more than one disaster is unfolding at any given time or because of different rates of response to disaster (communities may become isolated by disaster impacts, slowing their recovery). Discrete events often overlap, forming a complex mix of hazard types and disaster stages in any one place. From the perspective of impacted communities, Mitchell (1996, p31) quotes LaPlante (1988, p220) at length, and this is worth repeating here in anticipation of the discussions of community and grassroots actors which follow in Chapters 3–8:

'[T]he emergency phase, is typically a period of high consensus in the community, with much altruistic behaviour aimed at preventing or reducing human suffering. Next, activities that will return the community to normal functioning are undertaken and initiate the second period, called the restoration phase. When a semblance of normal functioning is achieved, activities aimed at permanence begin the reconstruction phase: families return to home, work or school and community rebuilding gets under way. Family and individual needs may come into conflict with community goals at this stage of recovery... [A] final stage ... reflects activity at essentially the community level, called the ... development reconstruction phase. During this time of second-stage community reconstruction, plans and actions decided upon during the earlier reconstruction are implemented.

An important indicator of the capacity of a community or urban system to adapt to environmental hazards is the extent to which plans and actions decided upon before the disaster are reappraised. When time and political and financial resources are limited there is a danger that restoration and reconstruction are drawn out or never fully completed, exposing vulnerable individuals and groups to additional hazard, or that pre-disaster conditions are simply replicated.

The lack of a developed critical assessment of the social aspects of urban disaster is partly explained by the historical development of disaster studies, which has drawn greatly from examinations of mainly rural events, particularly floods and famines. By looking at the geography of environmental risk in this way, cities have been perceived as offering some security to these hazards, for example by providing access to food resources during a famine (Drèze and Sen, 1989) or as a place where resources are available for responding to rapid onset disasters. But cities are increasingly becoming the locus of risk (Mitchell, 1999). As early as 1994, Green (in Blaikie et al, 1994) commented that flooding, once a classic hazard of rural areas, was becoming a predominantly urban event. In 1993 Anton identified urban drought as an emergency problem for cities in Latin America.

In urban development there has been a contradictory tendency to exclude nature from analysis (Allen, Massey and Pryke, 1999). In urban areas, society is popularly perceived as being in control of a benign physical environment where temperature can be moderated, disease controlled, floodwaters channelled away and food easily accessed. The low priority afforded to environmental hazard is reflected in the dearth of information about hazards in many cities. Outside the wealthiest of cities it is unusual to find a database of identified hazard risk areas or populations at risk. Mitchell (1999) found this to be the case for several of the world's largest cities including Seoul, Republic of Korea, and Dhaka, Bangladesh, where despite hundreds of lives having been lost to floods neither city had collated information on hazard experience as a first step to mitigating risk. Where risks have been locally mitigated in cities they tend to have been shifted onto other populations and ecological systems. For example, sewerage

may be piped out of some wealthy urban districts but is often received as river pollution by downstream peri-urban and rural communities (Hardoy, Mitlin and Satterthwaite, 2001).

Throughout this work the use of 'environmental' is preferred to 'natural' risk, hazard or disaster. This is because it is becoming increasingly difficult to separate the human and 'natural' causes of hazard and disaster events. Basic physical systems, from global climate circulation to local hydraulic regimes, have been influenced by human activity (IPCC, 2001). Smith (1984) called this process the construction of a 'second nature', where human intervention had created an increasingly modified natural world leaving few if any elements of it in a pristine state. There is a burgeoning literature on the human production of nature that supports this view (Peet and Watts, 1996; Bryant and Bailey, 1997; Braun and Castree, 1998). The recognition that human action has led to global climate change and accelerated sea-level rise makes it difficult to claim that any hydrological or meteorological hazard impacting on the city is entirely 'natural' in origin, although this claim is less valid for earthquake or volcanic hazard.

Catastrophic and chronic disaster

Work and writing on the urban environment tends to treat large, catastrophic events separately from apparently more trivial everyday hazards. Catastrophic shocks, such as flooding, hurricanes, earthquakes, droughts etc, win popular attention and are the concern of disaster studies specialists (Pelling, 2001b). Everyday hazards or chronic disasters are felt as long-term stresses associated with exposure to everyday risks such as poor sanitation, unfit housing or polluted air. Everyday hazards are less visible, and certainly less newsworthy than catastrophic events, and have been analysed in a somewhat fragmented fashion by diverse specialists including engineers, medics, land-use planners and urban sociologists. But chronic and catastrophic disasters are linked in many ways.

Figure 1.2 depicts the frustration experienced in Georgetown, Guyana, by residents having to cope with the inconveniences and health consequences of an inadequate drinking water supply whilst a dysfunctional drainage system leads to regular flooding in the city. Clearly, in this case at least, catastrophic and chronic hazards share root causes in a decaying urban infrastructure – an experience repeated throughout the cities of the developing world. But just how deep do these common roots go, and to what extent are shared patterns of risk generation amenable to common policy responses? This is a critical question for city authorities and funding agencies with limited financial resources. Some answers to these questions are offered in the following discussions. The everyday hazards that underlie chronic disaster (for example, daily exposure to disease pathogens) pave the way for catastrophic disaster by the incremental lowering of people's thresholds of resilience (Kasperson et al, 1996). At the same time, daily exposure to low levels of risk can have the perverse effect of reducing



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Source: Pelling (2001b)

Figure 1.2 *Everyday and catastrophic hazards in Georgetown, Guyana*

people's willingness to prepare for the possibility of catastrophic disaster, as risk becomes an accepted and normalized part of everyday life (Blaikie et al, 1994). Following catastrophic events, levels of resilience to both chronic stress and any subsequent catastrophic shock for individuals and groups are typically lowered. Indeed, in catastrophic disasters, the greatest potential for loss of life often comes not from the direct impacts of the hazard – collapsed houses or flying debris – but from everyday health risks following the dislocations caused by a catastrophic disaster, such as limited access to clean drinking water, lack of sanitation, insufficient access to food, warmth or shelter and social disorder. Frequent exposure to risk can lead to what Chambers (1989) described as the ratchet effect of vulnerability, where each succeeding event reduces the resources a group or individual has to resist and recover from the next environmental shock or stress. In cities the ratchet effect will be generated and felt by people having to live with multiple risk types – crime and violence, disease, unemployment, pollution and technological hazard – as well as environmental hazard.

Within disaster management, the need to integrate chronic and catastrophic disaster has been recognized, for example by the United Nations (UN) Healthy Cities Programme (WHO, 1999). However, the holism argued for by sustainable urbanization has not yet produced a synthesized policy approach to chronic and catastrophic disaster. The approach taken here is to broaden the standard conceptualization of disaster as catastrophe to include the chronic events rooted in everyday hazard. The distribution of both types of risk stems from unequal power relations between different social classes and residential districts in the city. Differential ability to access basic resources and services from the state, civil society and private sector shape the capacity of communities to avoid

environmental risk. This is as true for risk from hurricane damage stemming from poorly constructed houses as it is for risk from diseases carried by vectors thriving in unsanitary neighbourhoods where garbage is left uncollected. The proximate environmental causes of catastrophic and everyday risks are also similarly associated with improper sanitation, inadequate drinking water provision and garbage collection, inappropriate housing construction and location, and insufficient education and health care (Hardoy, Mitlin and Satterthwaite, 1992). It is less important to separate the two final categories of risk than it is to understand the shared underlying processes that lead to human vulnerability overall. As the International Federation of the Red Cross and Red Crescent (IFRC/RC) argues, 'a city with good sewers, drains and rubbish collection is also much better able to cope with flooding. Well-designed and well-built homes greatly reduce risks from physical hazard, and from earthquakes, floods or cyclones' (IFRC/RC, 1998, p13).

OUTLINE OF THE BOOK

The body of this book is divided into three sections. Section I, comprising this introduction and Chapters 2, 3 and 4, sets up and then explores in detail an argument for the analysis of human vulnerability to urban environmental hazard based around the concept of adaptive potential. This theoretical debate is then grounded in Section II by Chapters 5, 6 and 7, which examine adaptive potential in three contrasting urban political contexts. In particular, the case studies allow us to appreciate the ways in which different aspects of the theoretical discussions can interact and affect one another in lived experience. These case studies and the theoretical debate are then synthesized in the final section and concluding chapter.

We have already introduced the concept of human vulnerability and situated it in broader debates and policy on sustainable development and the city. Chapter 2 takes this discussion of urban risk further through an analysis of the scale and nature of environmental risk faced by urban populations. The interactions between environmental hazard and disaster and urban evolution are explored. Chapter 3 examines the intellectual origins of vulnerability. To do this we need to travel outside of the urban studies literature and draw from studies of social vulnerability to environmental hazard in rural settings. Applying this work to hazards in an urban context is achieved through a discussion of adaptive potential at the local level. In Chapter 4 we take a closer look at the types of actor that make up systems of governance in the urban South. These include: the local representatives of global actors, such as INGOs and international financial institutions (IFIs), national governments, municipal governments, indigenous NGOs with national, city or local spheres of influence, and community-based organizations (CBOs).

The three case study cities, with populations ranging from 200,000 to 5 million, fulfil two purposes. First, they form a bridge in the literature on

sustainable urbanization which has focussed on mega-cities with 5 million or more residents and tended to overlook smaller cities, despite these holding the majority of urban citizens in aggregate (Mitchell, 1999; Satterthwaite, 1999). Second, they represent examples of the reproduction of vulnerability and of adaptive potential under contrasting political-economic regimes. The first case study of a liberal democracy is set in Bridgetown, Barbados, one of the most highly ranked developing countries (UNDP, 2000). In Bridgetown, modernization and macro-economic growth have coincided with an undermining of community development and civil society, which in turn casts doubt on adaptive potential. The second case study is of a city that has passed through a centralized and so-called 'socialist' regime. Georgetown, Guyana, is an example of a post-socialist urban society where civil society and the private sector are both very weak and require building for adaptive potential to accrue, and where there is a tension between the long-term need to rebuild civil society to enhance adaptive potential and the desire for short-term mitigation efforts which overlook the deeper social roots of vulnerability. The third case study focusses on a country that has a history of right-wing government. Santo Domingo, the Dominican Republic, has a well-developed civil society, but one that is in competition with itself and the state. This has undermined opportunities for cooperation and constrained adaptive potential. In just three case studies it is not possible to capture the variety of state/civil society/private sector regimes that shape the reproduction of vulnerability throughout the global South, nor would it be advisable to try. However, this approach is useful in capturing the dominant political and economic fault lines and extremes of policy and action that are indicative of human processes leading to urban disaster which can be found to varying degrees of intensity and scope across urban societies.

In the final concluding chapter the theoretical discussions and case study material are brought together. An argument is made for social resilience as a concept that can move forward theory and policy on urbanization and disaster. Resilience incorporates the notion of adaptive potential as a response to human vulnerability and places politics (individual to global) at the centre of analysis and praxis on sustainable urbanization. Finally, some priority areas for further study and reflection are identified to encourage a broader discourse on urbanization and disaster.

References

- Abbott, J. (1996) *Sharing the City: Community Participation in Urban Management*, Earthscan, London
- Adams, W. M. (1990) *Green Development: Environment and Sustainability in the Third World*, Routledge, London
- Adger, N. (1996) *Approaches to Vulnerability to Climate Change*, CSERGE working paper #GEC 96-05, University of East Anglia, Norwich
- Adger, W. N. (1999) Social vulnerability to climate change and extremes in coastal Vietnam, *World Development* 27 (2), 249–269
- Adger, W. N. (2000) Institutional adaptation to environmental risk under the transition in Vietnam, *Annals of the Association of American Geographers* 90, 738–758
- Advocate Newspaper (1989) 'Relocated homes will be ready soon', 12 January, p3
- Advocate Newspaper (1995a) 'Ripped apart', 4 August, p52
- Advocate Newspaper (1995b) 'Dengue threat worries Lashley', 9 October, p5
- Advocate Newspaper (1997) 'On sandy or sani soil?' 11 July, p12
- Albala-Bertrand, J. M. (1993) *Political Economy of Large Natural Disasters: With Special Reference to Developing Countries*, Clarendon Press, Oxford
- Alexander, D. (1989) Urban landslides, *Progress in Physical Geography* 13, 157–191
- Alexander, D. (2000) *Confronting Catastrophe*, Terra, Harpenden
- Alfonso, H. D. (1997) Political decentralisation and popular alternatives: a view from the South, in Kaufman, M. and Alfonso, H. D. (eds) *Community Power and Grassroots Democracy*, Zed Books, London
- Allen, J. , Massey, D. and Pryke, M. (eds) (1999) *Unsettling Cities*, Routledge, New York
- Allison, M. , Harris, P. J. C. , Hofny-Collins, A. H. and Stevens, W. (1998) *A Review of the Use of Urban Waste in Peri-urban Interface Production Systems*, Department for International Development, London
- AMDEM (1999) Interview with Director, 18 June
- Amis, P. (1997) India urban poverty: where are the levers for its effective alleviation? *IDS Bulletin* 28 (2), 94–105
- Anderson, M. (1990) *Analyzing the Costs and Benefits of Natural Disaster Responses in the Context of Development*, Environment working paper #29, World Bank, Washington DC
- Anderson, M. (1992) Metropolitan areas and disaster vulnerability: a consideration for developing countries, in Kreimer, A. and Munasinghe, M. (eds) *Environmental Management and Urban Vulnerability*, World Bank discussion paper #18, World Bank, Washington DC
- Anon (1993) *Disaster Reduction, Environment and Development Brief*, UNESCO, Paris
- Anton, D. J. (1993) *Thirsty Cities: Urban Environments and Water Supply in Latin America*, International Development Research Centre, Ottawa
- APRODEMI (1999) community leader, personal communication
- Aroyo (1999) leader of community group Junta de Vecinos Grito de Capitollo, personal communication
- Azuela, A. , Duhau, E. and Ortiz, E. (eds) (1998) *Evictions and the Right to Housing: Experience from Canada, the Dominican Republic, South Africa, and South Korea*, International Development Research Centre, Ottawa
- Barnett, J. (2001) Adapting to climate change in Pacific island countries: the problem of uncertainty, *World Development* 29 (6), 977–993
- Bebbington, A. and Riddell, R. (1995) The direct funding of southern NGOs by donors: new agendas and old problems, *Journal of International Development* 7 (6), 879–893
- Beck, U. (1992) *Risk Society: Towards a New Modernity*, Sage, London
- Becker, C. (1999) Guyana Field Director, USAID, personal communication
- Bennett, J. (2000) Interagency co-ordination in emergencies, in Robinson, D. , Hewitt, T. and Harriss, J. (eds) *Managing Development: Understanding Inter-Organisational Relationships*, Sage, London
- Benson, C. (1997) *The Economic Impact of Natural Disasters in the Philippines*, Working paper 99, Overseas Development Institute, London
- Berke, P. R. and Beatley, T. (1992) *Planning for Earthquakes: Risk, Politics, and Policy*, Johns Hopkins University Press, Baltimore

Berke, P. R. , Kartez, J. and Wenger, D. (1993) Recovery after disaster: achieving sustainable development, mitigation and equity, *Disasters* 17 (2), 93–109

Blaikie, P. , Cannon, T. , Davis, I. and Wisner, B. (1994) *At Risk: Natural Hazards, People's Vulnerability, and Disasters*, Routledge, London

Blair (1999) community leader, personal communication

Bolt, B. A. (1993) *Earthquakes*, Freeman, New York

Braun, B. and Castree, N. (eds) (1998) *Remaking Reality: Nature at the Millennium*, Routledge, London

Brennan-Galvin, E. (2001) The future of the world's megacities, *Global Outlook*, Woodrow Wilson Center for Scholars, Washington DC, pp18–24

Brewster, L. (1992) A Report on an Inventory of Domestic, Industrial and Agricultural Sources of Pollution in Barbados, Coastal Conservation Unit, Bridgetown

Briggs, J. and Yeboah, I E. A. (2001) Structural adjustment and the contemporary sub-Saharan African city, *Area* 33 (1), 18–26

Brown, H. A. (1994) Economics of Disaster with Special Reference to the Jamaican Experience, Working paper #2, Centre for Environment and Development, University of the West Indies, Mona Campus, Jamaica

Bryant, R. L. and Bailey, S. (1997) *Third World Political Ecology*, London, Routledge

Bryant, N. (2001) Floods Highlight Washington's Weakness, BBC News, http://news.bbc.co.uk/hi/english/world/from_our_own_correspondent, accessed 18 August

Burton, I. , Kates, R. W. and White, G. F. (1993) *The Environment as Hazard*, Guildford Press, London

Bynoe (1999) community leader, Sophia squatters' settlement, personal communication

Callaway, B. and Creevey, L. (1989) Women and the state in Islamic West Africa, in Charlton, S. E. M. , Everett, J. and Staudt, K. (eds) *Women, the State and Development*, State University of New York, New York

Cambers, G. (1987) Report Showing Photographic Evidence of Severe Beach Erosion in Barbados, Inter-American Development Bank, Bridgetown

Cameron, J. (1999) community leader, Sophia squatters' settlement, personal communication

Castells, M. (1972) *The Urban Question*, Edward Arnold, London

Castells, M. (1983) *The City and the Grassroots*, Edward Arnold, London

Castells, M. (1996) *The Rise of Network Society*, Blackwell, Oxford

Castree, N. and Braun, B. (2001) *Social Nature: Theory, Practice and Politics*, Blackwell, Oxford

Catafesta, C. (1999) Personal Communication

CDC (Civil Defence Commission) (1997) National Emergency Flood Relief, CDC, Georgetown

CDC (Civil Defence Commission) (1998) Director, personal communication

CDC (Civil Defence Commission) (1999) El Niño Crisis in Guyana 1997–1998, CDC, Georgetown

Cela, J. (1996) La ciudad del futuro o el futuro de la ciudad, *Antología Urbana de la Ciudad Alternativa, Ciudad Alternativa*, Santo Domingo, pp115–122

Cela, J. (1999) Personal Communication

CERO (Central Emergency Relief Organization) (1998) Personal Communication, 30 July

Chambers, R. (1989) Editorial introduction: vulnerability, coping and policy, *IDS Bulletin* 20 (2), 1–7

Chambers, R. (1995) Poverty and livelihoods: whose reality counts? *Environment and Urbanization* 7 (1), 173–204

Chan (1999) community leader, Sophia squatters' settlement, personal communication

Charles, C. L. , McNulty, S. and Pennell, J. A. (1998) *Partnering for Results: A Users' Guide to Intersectoral Partnering*, USAID, Washington DC

Charvériat, C. (2000) Natural Disasters in Latin America and the Caribbean: An Overview of Risk, Working paper 434, Inter-American Development Bank, Washington DC

Chester, D. K. (2002) Overview: hazard and risk, in Allison, R. J. (ed) *Applied Geomorphology: Theory and Practice*, John Wiley and Sons, Chichester

Chester, D. K. , Degg, M. , Duncan, A. M. and Guest, J. E. (2001) The increasing exposure of cities to the effects of volcanic eruptions: a global survey, *Environmental Hazards* 2 (3),

- Choguill, C. L. and Choguill, M. B. G. (1996) Toward sustainable infrastructure for low-income communities, in Pugh, C. (ed) *Sustainability, the Environment and Urbanization*, Earthscan, London
- Choup, A. (2000) Municipal government, decentralization and civil society organizations: the case of Santo Domingo's grassroots organizations, paper presented at the Latin American Studies Association, Hyatt Regency Hotel, Miami, 18 March
- CIDA (Canadian International Development Agency) (1999) personal communication with country representative
- Clark, D. (2000) World urban development: processes and patterns at the end of the twentieth century, *Geography* 85 (1), 15–23
- Claudette (1999) Community Leader, Sophia squatters' settlement, personal communication
- Clement, D. (1990) An Analysis of Disaster: Life after Gilbert, Working paper 37, Institute of Social and Economic Research, University of the West Indies, Barbados
- Coburn, A. , Pomonis, A. and Sakia, S. (1989) Assessing strategies to reduce casualties in earthquakes, in *International Workshop on Earthquake Injury Epidemiology for Mitigation and Response*, Johns Hopkins University Press, Baltimore
- Coleman, D. and Schofield, R. (eds) (1986) *The State of Population Theory: Forward From Malthus*, Blackwell, Oxford
- Collado, F. (1997) *Ventajas de la Descentralización Para el Desarrollo*, Editora Travárez, Santo Domingo
- Colletta, N. J. and Cullen, M. L. (2000) *Violent Conflict and Transformation of Social Capital: Lessons from Cambodia, Rwanda, Guatemala and Somalia*, World Bank, Washington DC
- Community Development Division (1998) *Groups and Organisations in Barbados*, Community Development Division, Bridgetown
- Connolly, P. (1999) Mexico City: our common future? *Environment and Urbanization* 11 (1), 53–78
- Coppin, A. (1995) Women, men and work in a Caribbean economy: Barbados, *Social and Economic Studies* 44 (2 & 3), 103–124
- CPRME (Comisión Presidencial para la Reforma y Modernización del Estado) (1998) *Reforma del Estado y Descentralización*, Impresel, Santo Domingo
- Cross, J. A. (2001) Megacities and small towns: different perspectives on hazard vulnerability, *Environmental Hazards* 3 (2), 63–80
- Daily Nation (1998a) 'No one to support residents', 31 August
- Daily Nation (1998b) 'Wash-out', 21 October
- Degg, M. (1986) Earthquake hazard assessment after Mexico (1985), *Disasters* 13 (3), 237–246
- Degg, M. (1992) Natural disasters: recent trends and future prospects, *Geography* 77, 198–209
- Degg, M. (1998) Natural hazards in the urban environment: the need for a more sustainable approach to mitigation, in Maund, J. G. and Eddleston, M. (eds) *Geohazards in Engineering Geology*, Engineering Geology Special Publication, 15, Geological Society, London, 329–337
- Desai, V. (1995) *Community Participation and Slum Housing: A Study of Bombay*, Sage, London
- Desai, V. (1996) Access to power and participation, *Third World Planning Review* 18 (2), 217–242
- de Soto, H. (1989) *The Other Path: The Invisible Revolution in the Third World*, I B Taurus, London
- DFID (Department for International Development) (2000) *Partnerships with the Private Sector*, www.dfid.gov.uk/public/working/buspart/ (February 2002)
- Diaram, R. (1999) Guyana's experience with CPACC's screening assessment of coastal vulnerability, paper presented at a Vulnerability and Adaptation Workshop, University of the West Indies, Port of Spain, Trinidad, 20–22 July
- Dierwechter, Y. (2002) Six cities of the informal sector – and beyond, *International Development Planning Review* 24 (1), 21–41
- Dillinger, W. (1994) *Decentralisation and its Implications for Urban Service Delivery*, Urban Management Programme, UNDP/UNCHS/World Bank, Nairobi

Disaster Emergency Committee (2002) Report on the Response to the Gujarat Earthquake, 2001, Disaster Emergency Committee, London

Division of Housing (1998) personal communication, 7 September

Drakakis-Smith, D. (1996) Sustainability, urbanisation and development, *Third World Planning Review* 18 (4), iii–x

Drèze, J. and Sen, A. (1989) *Hunger and Public Action*, Oxford University Press, Oxford

Duarte, I. , Brea, R. and Holguín, R. (1998) *La Cultura Política Dominicana: Entre el Paternalismo y la Participación*, Impresos Camilo, Santo Domingo

Duncan, N. (1994) Barbados: democracy at the crossroads, in Carlene, E. J. (ed) *Democracy in the Caribbean: Myths and Realities*, Praeger, London

Edwards, S. and Hulme, M. (1996) Too close for comfort? The impact of official aid on nongovernmental organisations, *World Development* 24 (6), 961–973

Enarson, E. and Morrow, B. H. (1998) *The Gendered Terrain of Disaster: Through Women's Eyes*, International Hurricane Center, Florida International University, Florida

Espillat, M. and Ballenilla, C. (1998) *Sistema Comunitario de Manejo y Control de Desechos Solidos Domésticos del Sector Los Manguitos del Barrio Capotillo*, Centro de Estudios Sociales P Juan Montalvo S J, Santo Domingo

Evans, P. (1996) Development strategies across the public–private divide, *Development and Change* 24 (6), 1–9

Everett, J. (1989) Incorporation versus conflict: lower class women, collective action, and the state in India, in Charlton, S. E. M. , Everett, J. and Staudt, K. (eds) *Women, the State and Development*, State University of New York Press, New York

Ferguson, T. (1995) *Structural Adjustment and Good Governance: The Case of Guyana*, Public Affairs Consulting Enterprise, Georgetown

Fernandez, A. S. (1996) Movimientos de pobladores: una alternativa para la participación popular, in *Ciudad Alternativa, Antología Urbana de la Ciudad Alternativa*, Ciudad Alternativa, Santo Domingo

Fiske, J. (1989) *Reading the Popular*, Unwin Hyman, Boston

Fiszbein, A. and Lowden, P. (1999) *Working Together For a Change: Government, Civic and Business Partnerships for Poverty Reduction in Latin America and the Caribbean*, Economic Development Institute of the World Bank, World Bank, Washington DC

Flentge, J. (2001) A Radio Soap Opera Promoting the Culture of Prevention! ISDR informe, www.eird.org/ing/revista/No3_2001/Pagina18.htm, accessed 13 September

Fowler, A. (1997) *Striking a Balance: A Guide to Enhancing the Effectiveness of Non-governmental Organisations in International Development*, Earthscan, London

Fowler, A. (2000) Beyond partnership: getting real about NGO relationships in the aid system, *IDS Bulletin* 31 (3), 1–13

Fowler, A. M. and Hennessy, K. J. (1995) Potential impacts of global warming on the frequency and magnitude of heavy precipitation, *Natural Hazards* 11, 283–303

Freire, P. (1985) *The Politics of Education: Culture, Power and Liberation*, Macmillan, Basingstoke

Friedmann, J. (1992) *Empowerment: The Politics of Alternative Development*, Belhaven, Oxford

Friedmann, J. (1996) Rethinking poverty: empowerment and citizens rights, *International Social Science Journal* 148, 161–172

Fukuyama, F. (2001) Social capital, civil society and development, *Third World Quarterly* 22 (1), 7–20

García, A. and Mercedes, A. (1996) Organizaciones barriales, mejoramiento urbano y desarrollo de la ciudad, in *Ciudad Alternativa, Antología Urbana*, Ciudad Alternativa, Santo Domingo

Garza, G. (1999) Global economy, metropolitan dynamics and urban policies in Mexico, *Cities* 16 (3), 149–170

Gazzoli, R. (1996) The political and institutional context of popular organisations in urban Argentina, *Environment and Urbanization* 8 (1), 159–166

George, S. (1992) *The Debt Boomerang, Pluto*, London

Germain, R. D. (2000) *Globalization and its Critics: Perspectives from Political Economy*, Macmillan, Basingstoke

Giddens, A. (1984) *The Construction of Society: Outline of the Theory of Structuration*, University of California Press, Berkeley

Giddens, A. (1993) *New Rules of Sociological Method*, Polity, Oxford

Gilbert, A. , (1995) Debt, poverty and the Latin American city, *Geography* 80 (4), 323–333

Gilbert, A. and Ward, P. (1984a) Community action by the urban poor: democratic involvement, community self-help or a means of social control? *World Development* 12 (8), 769–782

Gilbert, A. and Ward, P. (1984b) Community participation in upgrading irregular settlements: the community response, *World Development* 12 (9), 913–922

Gilbert, R. , Stevenson, D. , Girardet, H. and Stren, R. (1996) *Making Cities Work: The Role of Local Authorities in the Urban Environment*, Earthscan, London

Gilbert, R. and Kreimer, A. (1999) *Learning from the World Bank's Experience of Natural Disaster Related Assistance*, Urban Development Division working paper series #2, World Bank, Washington DC

Giles, H. and Brown, B. (1997) And not a drop to drink: water and sanitation services to the urban poor in the developing world, *Geography* 82 (2), 97–109

Girardet, H. (1999) *Creating Sustainable Cities*, Schumacher Briefings #2, The Schumacher Society, Bristol

Goodhand, J. , Hulme, D. and Lewer, N. (2000) Social capital and the political economy of violence: a case study of Sri Lanka, *Disasters* 24 (4), 390–406

Government of Barbados (1996) *Habitat II: The Barbados National Report and Plan of Action*, Government of Barbados, Bridgetown

Government of Barbados (1998) *The Urban Renewal Programme (Greater Bridgetown Area)*, Government of Barbados, Bridgetown

GRC (Guyana Relief Council) (1999) Director, personal communication

Grant, R. (1998) Director of Pinelands Creative Workshop, personal communication

Green, A. and Matthias, A. (1995) NGOs – a policy panacea for the next millennium? *Journal of International Development* 7 (3), 565–573

Greenfield, G. (1994) *Latin American Urbanisation*, Greenwood Press, London

Gulkan, P. (2001) What Emerged From the Rubble, ProVention Consortium Conceptual Articles, www.proventionconsortium.org/articles/innovations.htm, accessed 13 September

Guyana Red Cross (1999) Director, personal communication

Guzman, R. (1999) interview at CONDIC, 5 May

Haggard, S. and Kaufman, R. (eds) (1992) *The Politics of Economic Adjustment*, Princeton University Press, Princeton

Halcrow plc (1994) *Primary Drainage System*, Georgetown Water and Sewerage Master Plan, Tn/GMP/09, Burdrop Park, Swindon

Haraway, D. (1997) *Modest Witness@Second Millennium*, Routledge, London

Hardoy, J. E. and Satterthwaite, D. (1989) *Squatter Citizen: Life in the Third World*, Earthscan, London

Hardoy, J. E. , Cairncross, S. and Satterthwaite, D. (1990) *The Poor Die Young: Housing and Health in Third World Cities*, Earthscan, London

Hardoy, J. E. , Mitlin, D. and Satterthwaite, D. (1992) *Environmental Problems in Third World Cities*, Earthscan, London

Hardoy, J. E. , Mitlin, D. and Satterthwaite, D. (2001) *Environmental Problems in an Urbanizing World*, Earthscan, London

Harris, N. (1995) Bombay in a global economy, structural adjustment and the role of cities, *Cities* 12, 175–184

Harriss, J. , Hunter, J. and Lewis, C. M. (eds) (1995) *The New Institutional Economics and Third World Development*, Routledge, London

Hartnady, C. (2002) *Earthquake Hazard in the Developing World*, submission to the International Strategy for Disaster Reduction consultation exercise in preparation for the Earth Summit 2002 conference, <http://earthsummit2002.dyndns.org/pages/discussion.cfm?ID=1&week=1>, accessed 28 April

Harvey, D. (1973) *Social Justice and the City*, Blackwell, Oxford

Harvey , D (1993) The nature of the environment: the dialectics of social and environmental change, in Milliband, R. and Panitch, L. (eds) *Real Problems, False Solutions: Socialist*

Register 1993, Merlin Press, London

Haughton, G. (1999) Environmental justice and the sustainable city, *Journal of Planning Education and Research* 18 (3), 233–243

Hecht, S. and Cockburn, A. (1989) *The Fate of the Forest: Developers, Destroyers and Defenders of the Amazon*, Penguin, London

Heijmans and Victoria (no date) *Citizenry-Based and Development-Oriented Disaster Response*, Center for Disaster Preparedness, Quezon City, the Philippines (www.adpc.ait.ac.th/pdr-sea/cbdo-dr/cover.html)

Hewitt, K. (ed) (1983) *Interpretations of Calamity: From the Viewpoint of Human Ecology*, Allen and Unwin, Boston

Hewitt, K. (1995) Sustainable disasters? perspectives and powers in the discourse of calamity, in Crush, J. (ed) *Power of Development*, Routledge, London

Hewitt, K. (1997) *Regions of Risk: A Geographical Introduction to Disasters*, Longman, Essex

Hildebrand, M. (2001) *The cities alliance: a new global challenge to urban poverty*, Global Outlook, Woodrow Wilson Center for Scholars, Washington DC, 16–17

Hobsbawm, E. J. (1996) The future of the state, *Development and Change* 27, 267–278

Hoy (1998) 'Hamilton and Son', 25 October

Hoy (1999a) 'Salud', 2 March

Hoy (1999b) editorial, 21 March

Huq, S. (1999) Environmental hazards in Dhaka, in Mitchell, J. K. (ed) *Crucibles of Hazard: Mega-cities and Disasters in Transition*, United Nations Press, Tokyo

Hurrell, A. (1994) A crisis of ecological viability? global environmental change and the nation state, *Political Studies* 42, 146–165

Hyden, G. (1997) Civil society, social capital and development: dissection of a complex discourse, *Studies in Comparative Development* 32 (1), 3–30

IDDI (Instituto Dominicano Desarrollo Integral) (1999) Los Manguitos project manager, personal communication

IFRC/RC (International Federation of the Red Cross and Red Crescent) (1998) *World Disasters Report 1998*, Oxford University Press, Oxford

IFRC/RC (International Federation of the Red Cross and Red Crescent) (1999) *World Disasters Report 1999*, Edigroup, Switzerland

IPCC (Intergovernmental Panel on Climate Change) (1990) *Climate Change: The IPCC Scientific Assessment*, Cambridge University Press, Cambridge

IPCC (Intergovernmental Panel on Climate Change) (2001) *Climate Change 2001: Impacts, Adaptation and Vulnerability*, www.ipcc.ch

Jacobi, P. (1997) Environmental problems in Sao Paulo: the challenge for coresponsibility and innovative crisis management, *Journal of Contingencies and Crisis Management* 5 (3), 131–139

James (1999) community leader, Sophia squatters' settlement, personal communication

Jordan, A. and O'Riordan, T. (1995) *Institutional Adaptation to Global Environmental Change (1): Social Institutions, Policy Change and Social Learning*, GEC 95-20, CSERGE, University of East Anglia

Junta de Vecinos Los Manguitos (1999) Director, personal communication

Kanneh, M. S. (1993) *Alboustown Upgrading Project: Terminal Report*, Central Housing and Planning Authority, Guyana

Kasperson, J. X. , Kasperson, R. E. and Turner, B. L. (1996) *Regions at Risk: Comparisons of Threatened Environments*, United Nations University Press, Washington DC

Kerr, D. and Kwele, N. (2000) Capital accumulation and the political reproduction of the urban housing problem in Botswana, *Urban Studies* 37 (8), 1313–1344

Khan, S. M. (1998) *Flood Rains in Guyana*, Hydrometeorological Service, Guyana

Kreimer, A. and Munasinghe, M. (eds) (1992) *Environmental Management and Urban Vulnerability*, World Bank Discussion Paper 168, World Bank, Washington DC

LaPlante, J. M. (1988) Recovery following disaster: policy issues and recommendations, in Comfort, L. K. (ed) *Managing Disaster: Strategies and Policy Perspectives*, Duke University Press, Durham, USA

Leach, M. , Mearns, R. and Scoones, I. (1997) *Environmental Entitlements: A Framework for Understanding the Institutional Dynamics of Environmental Change*, Discussion paper #359,

Institute of Development Studies, University of Sussex, Brighton

Leitmann, J. (1991) Environmental profile of São Paulo, in Munasinghe, M. (ed) *Managing Natural Disasters and the Environment*, World Bank, Washington DC

Lewis, O. (1966) The culture of poverty, *Scientific American* 214, 19–25

Lewis (1999a) Community Leader, Sophia squatters' settlement, personal communication, 31 October

Lewis, J. (1999b) *Development in Disaster-prone Places*, Intermediate Technology Publications, London

Lipton, M. and Maxwell, S. (1992) *The New Poverty Agenda: An Overview*, Discussion paper #306, Institute of Development Studies, University of Sussex, Brighton

Lister, S. (2000) Power in partnership? analysis of an NGO's relationships with its partners, *Journal of International Development* 12, 227–239

Listin Diario (1998) Seis millones de personas vivieron en las zonas afectadas por el huracán, 9 October

Lomnitz, L. (1977) *Networks and Marginality: Life in a Mexican Shanty Town*, Academic Press, New York

Losada, H. , Bennett, R. , Soriano, R. , Vieyra, J. and Cortés, J. (2000) Urban agriculture in Mexico city: functions provided by the use of space for dairy based livelihoods, *Cities* 17 (6), 419–432

McCarney, P. L. (ed) (1996) *Cities and Governance: New Direction in Latin America, Asia and Africa*, University of Toronto, Toronto

McGranahan, G. , Songsore, J. and Kjellén, M. (1996) Sustainability, poverty and urban environmental transitions, in Pugh, C. (ed) *Sustainability, the Environment and Urbanization*, Earthscan, London

McGranahan, G. , Jacobi, P. , Songsore, J. , Surjadi, C. and Kjellén, M. (2001) *The Citizens at Risk: From Urban Sanitation to Sustainable Cities*, Earthscan, London

McIlwaine, C. (1998) Civil society and development geography, *Progress in Human Geography* 22 (3), 414–424

McIlwaine, C. and Moser, C. (2001) Violence and social capital in urban poor communities: perspectives from Colombia and Guatemala, *Journal of International Development* 13, 1–20

Main, H. and Williams, S. W. (eds) (1994) *Environment and Housing in Third World Cities*, Wiley, Chichester

Mata Mamon (1999) community leader, personal communication

Matias, D. (1997) *Partidos, Sociedad Civil y Reforma Municipal*, Union de Vecinos Activos, Santo Domingo

Matsukawa, T. (2001) *Innovations in Disaster Management: Mobilizing Private Financing*, ProVention Consortium conceptual articles, www.proventionconsortium.org/articles/innovations.htm, accessed 13 September

May, P. J. , Burby, R. J. , Erikson, N. J. , Dixon, J. E. , Michaels, S. and Smith, D. I. (1996) *Environmental Management and Governance: Intergovernmental Approaches to Hazards and Sustainability*, Routledge, London

Mearns, R. (1995) Institutions and natural resource management: access to and control over woodfuel in East Africa, in Binns, T. (ed) *People and Environment in Africa*, John Wiley and Sons, Chichester

Mercer, C. (2002) NGOs, civil society and democratisation: a critical review of the literature, *Progress in Development Studies* 2 (1), 5–22

Minh-Ha, T. (1989) *Women, Nature, Other*, Indiana University Press, Indiana

Mitchell, J. K. (1996) Improving community responses, in Mitchell, J. K. (ed) *The Long Road to Recovery: Community Responses to Industrial Disaster*, United Nations University Press, Tokyo, pp1–41

Mitchell, J. K. (1999) *Crucibles of Hazard: Mega-Cities and Disasters in Transition*, UNU Press, Tokyo

Mitchell, J. K. (2001) What's in a name? issues of terminology and language in hazards research, *Environmental Hazards* 2 (3), 87–88

Mitchell, J. K. , Devine, N. and Jagger, K. (1989) A contextual model of natural hazard, *Geographical Review* 89 (4), 391–409

Mitlin, D. (2001) Civil society and urban poverty: examining complexity, *Environment and Urbanization* 13 (2), 151–174

Mitlin, D. and Thompson, S. (1995) Participatory approaches in urban areas: strengthening civil society or reinforcing the status quo, *Environment and Urbanization* 7 (1), 231–250

Mitlin, D. and Satterthwaite, D. (1996) Sustainable development and cities, in Pugh, C. (ed) *Sustainability, the Environment and Urbanization*, Earthscan, London

MOCUGRECA (1999) Director, personal communication

Mohan, G. (2002) Participatory development, in Potter, R. B. and Desai, V. (eds) *The Companion to Development Studies*, Arnold, London

Morel, E. (1996) Cuenca hidrográfica y urbanización, in *Ciudad Alternativa, Antología Urbana*, Ciudad Alternativa, Santo Domingo

Moser, C. (1996) *Confronting Crisis: A Comparative Study of Household Responses to Poverty and Vulnerability in Four Poor Urban Communities*, Environmental and Sustainable Studies and Monograph Series #8, World Bank, Washington DC

Moser, C. (1998) The asset vulnerability framework: reassessing urban poverty reduction strategies, *World Development* 26 (1), 1–19

Moser, C. , Herbert, A. and Makonnen, R. (1993) *Urban Poverty in the Context of Structural Adjustment: Recent Evidence and Policy Responses*, Urban Development Division, World Bank, Washington DC

Moser, C. , Gauhurts, M. and Gonhan, H. (1994) *Urban Poverty Research Sourcebook: Sub-city Level Research*, World Bank, Washington DC

Moser, C. and Holland, J. (1997) *Household Responses to Poverty and Vulnerability*, Volume 4: *Confronting Crisis in Chawama, Lusaka, Zambia*, Urban Management Programme Policy Paper #24, Urban Management Programme, Nairobi

Moser, C. and McIlwaine, C. (2001) *Violence in a Post-conflict Context: Urban Poor Perceptions from Guatemala*, World Bank, Washington DC

Mosse, D. (1994) Authority, gender and knowledge: theoretical reflections on the practice of participatory rural appraisal, *Development and Change* 25 (3), 497–526

Mossler, M. (1996) Environmental hazard analysis and small island states: rethinking academic approaches, *Geographische Zeitschrift* 84 (2), 86–93

Mulwanda, M. (1993) The need for new approaches to disaster management: the floods in Lusaka, Zambia, *Environment and Urbanization* 5 (2), 67–77

Munasinghe, M Menzes, B. and Preece, M. (1991) Rio reconstruction and flood prevention in Brazil, *Land Use Policy* 8 (4), October

Munich Re (1998) *World Map of Natural Hazards (2nd Edition)*, Munich Reinsurance Company, Munich

Narayan, D. (2000) *Voices of the Poor: Can Anyone Hear Us?* Oxford University Press, Oxford

National Labor Committee, El Salvador (2001) *Salvador earthquake: from poverty to misery*, www.nlcnet.org, accessed 21 February

Nicholls, R. J. (1995) Coastal megacities and climate change, *GeoJournal* 37 (3), 369–379

Norgaard, R. B. (1994) *Development Betrayed: The End of Progress and a Coevolutionary Revisioning of the Future*, Routledge, London

North, D. C. (1995) The new institutional economics and third world development, in Harriss, J. , Hunter, J. and Lewis, C. M. (eds) *The New Institutional Economics and Third World Development*, Routledge, London

Nurse, L. A. (1989) *The Effects of Hurricane Gabrielle on the Barbados East Coast*, Coastal Conservation Project Unit, Bridgetown

Nurse, L. A. (1997) *Report on Baseline Study – Scotland District: 27*, Community Development Division, Bridgetown

ODA (Overseas Development Administration) (1995) *Megacities: Reducing Vulnerability to Natural Hazards*, ODA and the Institute of Civil Engineers, Thomas Telford Press, London

Ojeda, A. C. (2001) *Strategic Community Management for Reducing Vulnerability to Disasters*, ISDR informe, www.eird.org/ing/revista/No3_2001/Pagina13.htm, accessed 13 September

O'Keefe, P. , Wisner, R. and Baird, A. (1977) Kenyan underdevelopment: a case study of proletarianisation, in O'Keefe, P. and Wisner, R. W. (eds) *Landuse and Development*, International African Institute, London

ONAPLAN (Oficina Nacional de Planificación) (1997) *Informe Población*, Government of the Dominican Republic, Santo Domingo, 11 December

- Ostrom, E. , Schroeder, L. and Wynne, S. (1993) *Institutional Incentives and Sustainable Development: Infrastructure in Perspective*, Westview Press, Oxford
- Özerdem, A. and Barakat, S. (2000) After the Marmara earthquake: lessons for avoiding short cuts to disasters, *Third World Quarterly* 21 (93), 425–439
- PAHO (Pan American Health Organization) (1994) *A World Safe from Natural Disasters*, the Journey from Latin America and the Caribbean, PAHO, Washinton, DC
- PAHO (Pan American Health Organization) (1998) Barbados, in *Health Conditions in the Americas*, Volume I, Scientific Publications, Washington DC
- PAHO (Pan American Health Organization) (2001) *Strengthening Local Capacity For Disaster Reduction: The Experience of PAHO*, ISDR Informe, www.eird.org/ing/revista/No3_2001/Pagina12.htm, accessed 13 September
- Payne, G. (1996) *Shelter Sector Diagnostic Guyana*, Department of Civic Design, Inter-American Development Bank, Washington DC
- Peak, L. and Trotz, D. A. (1999) *Gender, Ethnicity and Place: Women and Identities in Guyana*, Routledge, London
- Peet, R. and Watts, M. (1996) *Liberation Ecologies: Environment, Development, Social Movements*, Routledge, London
- Pelling, M. (1992) *Housing Strategies Employed by Lower-Income Groups in Greater Georgetown, Guyana*, occasional paper, Department of Geography, University of Guyana, Guyana
- Pelling, M. (1997) What determines vulnerability to floods: a case study in Georgetown, Guyana, *Environment and Urbanization* 9 (1), 203–226
- Pelling, M. (1998) Participation, social capital and vulnerability to urban flooding in Guyana, *Journal of International Development* 10, 469–486
- Pelling, M. (1999) The political ecology of flood hazard in urban Guyana, *Geoforum* 30, 249–261
- Pelling, M. (2001a) Sustainable cities, in Willis, K. and McIlwaine, C. (eds) *Middle America*, Addison Wesley Longman, London
- Pelling, M. (2001b) Natural disasters? in Castree, N. and Braun, B. (eds) *Social Nature: Theory, Practice and Politics*, Blackwell, Oxford
- Pelling, M. (2002) Assessing urban vulnerability and social adaptation to risk, *International Development Planning Review* 24 (1), 59–76
- Pelling, M. and Uitto, J. (2001) Small island developing states: natural disaster vulnerability and global change, *Environmental Hazards* 3 (2), 49–62
- Pelling, M. , Özerdem, A. and Barakat, S. (2002) The macro-economic impact of disasters, *Progress in Development Studies* 2 (4), 283–305
- Pérez, C. (1992) *Movimientos Sociales Dominicanos: Identidad y Dilemas*, INTEC, Santo Domingo
- Pérez, C. (1996) *Urbanización y Municipio en Santo Domingo*, INTEC, Santo Domingo
- Pérez, C. (1997) Popular organisations in the Dominican Republic: the search for space and identity, in Kaufman, M. and Alfonso, H. (eds) *Community Power and Grassroots Democracy: The Transformation of Social Life*, Zed Books, London
- Pérez, C. (1999) interview at INTEC, 21 April
- Pezzoli, K. (1993) Sustainable livelihoods in the urban milieu: a case study from Mexico City, in Friedmann, J. and Haripriya, R. (eds) *In Defence of Livelihood: Comparative Studies on Environmental Action*, Kumarian Press and UNRISD, West Hartford
- Pitt, M. (2001) *Using Microfinance for Disaster Mitigation*, The World Bank Group, Disaster Mitigation Facility, www.worldbank.org/html/fpd/dmf/microfinance, accessed 31 August
- Potter, R. B. (1995) Urbanisation and development in the Caribbean, *Geography* 80, 334–341
- Potter, R. B. (2002) Global convergence, divergence and development, in Potter, R. B. and Desai, V. (eds) *The Companion to Development Studies*, Arnold, London
- Potter, R. B. and Lloyd-Evans, S. (1998) *The City in the Developing World*, Longman, Harlow
- Pred, A. and Watts, M. (1992) *Reworking Modernity: Capitalism and Symbolic Discontent*, Rutgers University Press, New Jersey
- Puente, S. (1999) Social vulnerability to disasters in Mexico City: an assessment method, in Mitchell, J. K. (ed) *Crucibles of Hazard: Mega-cities and Disasters in Transition*, UN University Press, Tokyo

- Pugh, C. (ed) (1996) *Sustainability, the Environment and Urbanization*, Earthscan, London
- Putnam, R. (2000) *Bowling Alone: The Collapse and Revival of American Community*, Simon and Schuster, New York
- Putnam, R. , Leonardi, R. and Nanetti, R. (1993) *Making Democracy Work: Civic Traditions in Modern Italy*, Princeton University Press, Princeton
- Ramia, J. (ed) (1994) *Humanidad y Naturaleza*, Fundación Ciencia y Arte, Santo Domingo
- Rashid, S. F. (2000) The urban poor in Dhaka City: their struggles and coping strategies during the floods of 1998, *Disasters* 24 (3), 240–253
- Riddell, B. (1997) Structural adjustment programmes and the city in tropical Africa, *Urban Studies* 34 (8), 1297–1307
- Robb, J. (1999) community leader, Sophia squatters' settlement, personal communication
- Rodriguez, A. and Winchester, L. (1996) The challenges for urban governance in Latin America: reinventing the government of cities, in McCarney, P. L. (ed) *Cities and Governance: New Directions in Latin America, Asia and Africa*, University of Toronto Press, Toronto
- Rosenau, J. (1997) *Along the Domestic–foreign Frontier*, Cambridge University Press, Cambridge
- Sahr, W. (1997) Semiotic-cultural changes in the Caribbean: a symbolic and functional approach, in Sahr, W. and Ratter, B. M. W. (eds) *Land, Sea and Human Effort*, University of Hamburg Press, Germany
- Samoff, J. (1990) Decentralisation and the politics of interventionism, *Development and Change* 21, 513–530
- Sanderson, D. (2000) Cities, disasters and livelihoods, *Environment and Urbanization* 12 (2), 93–102
- Sanderson, D. (2001) *Livelihoods, Disaster Risk Reduction, Urban Poverty*, CARE International UK, London
- Satterthwaite, D. (1997) Sustainable cities or cities that contribute to sustainable development? *Urban Studies* 34 (10), 1167–1691
- Satterthwaite, D. (1998) Meeting the challenge of urban disasters IFRC/RC, World Disasters Report 1998, Oxford University Press, Oxford
- Satterthwaite, D. (ed) (1999) *The Earthscan Reader in Sustainable Cities*, Earthscan, London
- Scholte, J. A. (2000) *Globalization: A Critical Introduction*, Macmillan, Basingstoke
- Schübeler, P. (1996) *Participation and Partnership in Infrastructure Management*, Urban Management Programme, UNDP/UNCHS/World Bank, Nairobi
- Schvenson, C. (1999) interview at UNDP, 28 April
- Scott, J. C. (1985) *Weapons of the Weak: Everyday Forms of Peasant Resistance*, Yale University Press, London
- Scott, J. C. (1990) *Domination and the Arts of Resistance: Hidden Transcripts*, Yale University Press, London
- Scott, N. (1999) Profiles of Squatting Areas in Guyana, paper presented at the National Symposium on Informal Human Settlement, University of Guyana, Georgetown, April 15
- Sen, A. (1981) *Poverty and Famines*, Oxford University Press, Oxford
- SESPAS (Secretaria de Estado de Salud Pública y Asistencia Social) (1996) *La Situación de Salud de Republica Dominicana*, SESPAS, Santo Domingo
- Sharma, S. (2001) Director of the Energy Environment Group, New Delhi, a note to the Mountain Forum – Asia elist mf-asia@lyris.bellanet.org
- Short, J. R. and Yeong-Hyun, K. (1999) *Globalization and the City*, Longman, Harlow
- Shrivastava, P. (1996) Long-term recovery from the Bhopal crisis, in Mitchall, J. K. (ed) *The Long Road to Recovery: Community Response to Industrial Disaster*, United Nations University Press, Tokyo
- Smith, K. (1992) *Environmental Hazards*, Routledge, London
- Smith, M. G. (1984) *Uneven Development*, Basil Blackwell, Oxford
- Smith, N. (1997) *Community Participation in the Implementation Process: Barbados - A Case Study in the Management of Coastal Areas*, Award Report, Canadian International Development Agency, Bridgetown
- Solway, L. (1994) Urban developments and megacities: vulnerability to natural disasters, *Disaster Management* 6 (3), 160–169

Stabroek News (1999a) 'Some 11.5M gallons of water wasted each day in city', 25 September, p15

Stabroek News (1999b) 'City Budget' 6 October, p2

Stabroek News (1999c) 'Depoliticise management to turn city's fortunes around', 13 October, p3

Statistical Service (1993) Population and Housing Census, 1990 Government of Barbados, Bridgetown

Steedman, S. (1995) Megacities: the unacceptable risk natural disaster, *Built Environment* 21 (2/3), 89–94

Stren, R. (1989) The administration of urban services, in Stren, R. and White, R. R. (eds) *African Cities in Crisis: Managing Rapid Urban Growth*, Westview, Oxford

Sukul (1999) community leader, Sophia squatters' settlement, personal communication

Swift, J. (1989) Why are rural people vulnerable to famine? *IDS Bulletin* 20 (2), 815

Swyngedouw, E. A. (1997) Power, nature and the city: the conquest of water and the political ecology of urbanisation in Guayaquil, Ecuador, *Environment and Planning* 29, 311–332

Sylves, R. T. and Waugh, W. L. (eds) (1990) *Cities and Disaster: North American Studies in Emergency Management*, Charles C Thomas, Springfield

Thomas, C. Y. (1982) Guyana: the IMF-World Bank Group and the general crisis, *Social and Economic Studies* 31 (4), 16–70

Thomas, C. Y. (1995) *Social Development and the Social Summit: A Look at Guyana, Jamaica and Trinidad and Tobago*, Institute of Development Studies, University of Guyana, Georgetown

Thompson (1999) community leader, Sophia squatters' settlement, personal communication

Thorne (1999) Director, True Vision, personal communication

Thouret, J. C. (1999) Urban hazards and risks: consequences of earthquakes and volcanic eruptions, an introduction, *GeoJournal* 49 (2), 131–135

Timmerman, P. and White, R. (1997) Megahydropolis: coastal cities in the context of global environmental change, *Global Environmental Change* 7 (3), 205–234

Tobin, G. A. and Montz, B. E. (1997) *Natural Hazards: Explanation and Integration*, Guildford Press, London

Töpfer, K. (1999) The Earthquake in Turkey, United Nations Human Settlements Programme press release, 26 August

Trotz, A. (1995) Gender, Ethnicity and Familial Ideology: Household Structure and Female Labour Force Participation in Guyana, unpublished PhD thesis, University of Cambridge, Cambridge

Trujillo, M., Ordóñez, A. and Hernández, C. (2000) Risk-mapping and Local Capacities, Oxfam working papers, Oxfam, Oxford

Tucker, B. E., Erdik, M. and Hwang, C. N. (eds) (1994) *Issues in Urban Earthquake Risk*, NATO ASI Series, Series E: Applied Sciences, 271, Kluwer, London

Turner, R. K., Kelly, P. M. and Kay, R. C. (1990) *Cities at Risk*, University of East Anglia, Norwich

Twigg, J. (2001) *Corporate Social Responsibility and Disaster Reduction: A Global Overview*, Benfield Greig Hazard Research Centre, CPRME (Comisión Presidencial para la Reforma y Modernización del Estado), University College London, London

UCOREBAM (1999) Director, personal communication

Uitto, J. I. (1998) The geography of disaster vulnerability in megacities, *Applied Geography* 18 (1), 7–16

UNCRD (United Nations Centre for Regional Development) (1995) *A Call to Arms: Report of the 17 January Great Hanshin Earthquake*, UNCRD discussion paper 95-2, Nagoya, Japan

UNCSD (United Nations Commission on Sustainable Development) (1997) *Barbados: Country Profile*, UNCSO, New York

UNDP (United Nations Development Programme) (1990) *Hazard Mitigation and Emergency Management Project: Barbados*, UNDP, Bridgetown

UNDP (United Nations Development Programme) (1996) *Guyana: Human Development Report*, UNDP, Georgetown

UNDP (United Nations Development Programme) (1997) *Consolidated Report on the Elaboration of a Poverty Eradication Plan for Barbados*, Government of Barbados/UNDP,

Bridgetown

- UNDP (United Nations Development Programme) (1998a) Culture as a Tool for Sustainable Development: Case Study of the Pinelands Creative Workshop, UNDP, Bridgetown
- UNDP (United Nations Development Programme) (1998b) Report on the Impacts of Hurricane Georges in the Dominican Republic, UNDP, Santo Domingo
- UNDP (United Nations Development Programme) (1998c) Guyana Directory of Non-governmental Organisations, 1998, UNDP, Georgetown
- UNDP (United Nations Development Programme) (1999a) Emergency/Rehabilitation Program: After Hurricane Georges in the Dominican Republic, Programme Report (DOM 98/013), UNDP, Santo Domingo
- UNDP (United Nations Development Programme) (1999b) Guyana: Report of the 1999 Living Conditions Survey, UNDP, Georgetown
- UNDP (United Nations Development Programme) (2000) Human Development Report 2000, Oxford University Press, Oxford
- UNDP (United Nations Development Programme) (2001) Human Development Report 2001, Oxford University Press, Oxford
- UNDRCO (United Nations Disaster Relief Co-ordinator) (1991) Mitigating Natural Disaster Phenomena, Effects and Options: A Manual for Policy Makers and Planners, United Nations, New York
- UN Habitat (1999) Human Settlement Statistics, www.unchs.org/guo/hssq/index.asp, accessed 15 January 2002
- United Nations (1989) Prospects for World Urbanization, United Nations, New York
- United Nations (1995) World Urbanisation Prospects, United Nations Population Division, New York
- UNPD (United Nations Population Division) (1999) World Population Prospects: The 1999 Revision, UNDP, Washington DC
- Vance, J. E. (1970) The Merchant's World: The Geography of Wholesaling, Prentice-Hall, Englewood Cliffs
- Van den Bersselaar (2001) Rural–urban Social Ties in Nigeria, paper presented in the African studies series, University of Liverpool, Liverpool
- Van der Linden, J. (1997) On popular participation in a culture of patronage: patrons and grassroots organisations in a sites and services project in Hyderabad, *Environment and Urbanization* 9 (1), 81–90
- Vargas, T. (1994) Las Organizaciones de Base en Santo Domingo, Centro de Estudios P Juan Montalvo S J, Santo Domingo
- Vasta (1999) Community Participation in Postdisaster Reconstruction: Lessons Learned from the Maharashtra Emergency Earthquake Rehabilitation Program, The World Bank Group, Disaster Management Facility, www.worldbank.org/html/fpd/dmf/best_practices2.htm, accessed 31 August 2001
- Velásquez, D. (2001) Progress in the IMSS Solidarity Program in South Veracruz, Mexico, ISDR Informe, www.eird.org/ing/revista/No3_2001/Pagina17.htm, accessed 13 September
- Verba, S. (1978) Participation and Political Equality, Cambridge University Press, Cambridge
- Walker, K. J. (1989) The state in environmental management: the ecological dimension, *Political Studies* 37, 25–38
- Walton, J. and Seddon, D. (1994) Free Markets and Food Riots: The Politics of Global Adjustment, Blackwell, Oxford
- Watts, M. (1983) Silent Voice: Food Famine and Peasantry in Northern Nigeria, University of California Press, Berkeley
- Weinberger, K. and Jütting, J. P. (2001) Women's participation in local organizations: conditions and constraints, *World Development* 29 (8), 1391–1404
- White, G. F., Kates, R. W. and Burton, I. (2002) Knowing better and losing even more: the use of knowledge in hazards management, *Environmental Hazards* 3 (3–4), 81–92
- WHO (World Health Organization) (1999) Health: creating healthy cities in the 21st century, in Satterthwaite, D. (ed) *The Earthscan Reader in Sustainable Cities*, Earthscan, London
- Wildavsky, A. (1988) *Searching for Safety*, Transaction Books, London
- Wisner, B. (1996) The geography of vulnerability, in Uitto, J. I. and Schneider, J. (eds) *Preparing for the Big One in Tokyo: Urban Earthquake Risk Management*, United Nations University, Tokyo

- Wisner, B. (1998) Marginality and vulnerability: why the homeless of Tokyo don't 'count' in disaster preparations, *Applied Geography* 18 (1), 25–33
- Wisner, B. (2001) Why post-Mitch lessons didn't reduce El Salvador's earthquake losses, *Disasters* 25 (3), 251–268
- World Bank (1992) *Guyana: From Economic Recovery to Sustained Growth*, World Bank, Washington DC
- World Bank (1997) *World Development Report 1997*, Oxford University Press, Oxford
- World Bank (2000) *World Development Report 2000*, Oxford University Press, Oxford
- Wratten, E. (1995) Conceptualising urban poverty, *Environment and Urbanization* 7 (1), 11–36
- Yacoob, M. and Kelly, M. (1999) *Secondary Cities in West Africa: The Challenge for Environmental Health and Prevention*, Woodrow Wilson International Center for Scholars, Comparative Urban Studies Occasional Paper Series # 21, Washington DC
- Yodmani, S. (no date) *Disaster Risk Management and Vulnerability Reduction: Protecting the Poor*, paper presented at the Asian and Pacific Forum on Poverty, organised by the Asian Development Bank
- Young, L. and Barrett, H. (2001) Adapting visual methods: action research with Kampala street children, *Area* 33 (2), 141–152
- Zapata-Marti, R. (1997) Methodological approaches: the ECLAC methodology, in *Assessment of the Economic Impact of Natural and Man-made Disasters*, proceedings of the expert consultation on methodologies, Brussels, 29–30 September, Universite Catholique de Louvain, Belgium, pp10–12