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Disaster Risk Reduction, Climate Change Adaptation and Human Security

A Commissioned Report for the Norwegian Ministry of Foreign Affairs

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List of Abbreviations

AU	African Union
CBA-X	Community Based Adaptation Exchange
COP	Conference of Parties
CRA	Community Risk Assessment
CRED	Centre for Research on the Epidemiology of Disasters
DFID	Department for International Development
DRR	Disaster Risk Reduction
ENSO	El Niño-Southern Oscillation
ERM	Environmental Resources Management
GDP	Gross Domestic Product
HFA	Hyogo Framework for Action
HIV/AIDS	Human immunodeficiency virus/ Acquired Immune Deficiency Syndrome
IPCC	Intergovernmental Panel on Climate Change
ICSU	International Council for Science
LCA	Linking Climate and Adaptation
MDGs	Millennium Development Goals
NGO	Non-governmental Organizations
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
PAR	Pressure and Release
PTSD	Post-traumatic Stress Disorder
SBSTA	Subsidiary Body for Scientific and Technological Advice
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNISDR	United Nations International Strategy for Disaster Reduction
WHO	World Health Organization

1. Introduction

> Information on climate change is building a new perception of disasters as of our own making. The increase in storms, droughts and other hazards expected to arise from the accumulation of greenhouse gases in the atmosphere as a result of industrialization and deforestation is clearly not natural.
>
> (UNISDR 2008)[1]

The Norwegian Nobel Committee awarded the 2007 Nobel Peace Prize to the Intergovernmental Panel on Climate Change and Al Gore, in an effort to "contribute to a sharper focus on the processes and decisions that appear to be necessary to protect the world's future climate, and thereby to reduce the threat to the security of mankind."[2] In the wake of the 2007 award, the relationship between climate change and security has surfaced as a key concern among national governments and international institutions. Security concerns associated with climate change include the potential for conflict over natural resources, population displacement and migration as the result of sea-level rise or other large-scale biophysical, ecological or social disruptions, and the prospect of increasingly frequent humanitarian disasters as the result of extreme climate events.[3] Many of these concerns are, in fact, directly related to the notion of human security, which can be considered a state or condition where individuals and communities have the options necessary to end, mitigate or adapt to threats to their human, environmental and social rights; have the capacity and freedom to exercise these options, and actively participate in pursuing these options.[4] Enhancing human security in the 21st century is about responding to climate change and disaster risks in ways that not only reduce vulnerability and conflict, but also create a more equitable, resilient and sustainable future.[5]

Recognition of the threats to human security associated with climate change has generated growing interest in the relationship between disaster risk reduction and climate change adaptation (see Box 1 for definitions).[6] There is an intuitive understanding that the two are closely linked, yet it has been difficult to elaborate a common framework for addressing disaster risk in the context of climate change. Part of this difficulty is related to competing discourses and understandings of both hazards and climate change.[7] Although there is a growing recognition that climate change must be met by both mitigation and adaptation measures, most contemporary research and policy debates about adaptation remain focused on reducing the biophysical impacts associated with one or more scenarios of future climate change.

In spite of the increased attention, interest, and sense of urgency in understanding and responding to climate change, the broader social causes and consequences are seldom addressed. Many questions thus remain unanswered: How do factors such as gender, age, class, education, culture, traditions, and living conditions influence climate risk and vulnerability? How will climate change influence the capacity of individuals, communities, businesses, governments, and NGOs to respond to multiple and interacting stressors? How will gradual changes in climate affect people's vulnerability to disasters and erode their resilience and livelihoods? How do responses to climate change, including disaster risk reduction strategies aimed at reducing vulnerability, affect the diversity of needs and values that contribute to human well-being? Whose security is most threatened by climate change and why? Finally, what categories of action and which investments appear to be the most effective for promoting adaptation and risk reduction? The growing recognition that there may be an increasing number of disasters linked to floods, droughts, wildfires and other climate-influenced events, coupled with increasing concern over the social implications of climate variability and change, calls for a much deeper and broader assessment of the connections between disaster risk reduction, climate change adaptation and human security.

The findings of this report suggest a timely need to undertake a more thorough assessment of the role that disaster risk reduction and climate change adaptation can play in minimizing threats to human security. Although the relationship between disaster risk reduction and climate change adaptation is increasingly recognized by researchers, policy makers and practitioners within both communities, the two communities have yet to develop coordinated efforts towards reducing climate change risks and vulnerability, which includes increasing the capacity to cope with and adapt to rapid changes, complex emergencies, and considerable uncertainty about the future. Thus far, many of the discussions taking place on adaptation to climate change are not well-informed by disaster risk reduction strategies, tools, frameworks and experiences.[8] At the same time, the disaster risk community has not fully incorporated climate change dimensions and information on climate impacts into its work. The risk of more complex, frequent, intense or unpredictable extreme weather events associated with global temperature increases, changing precipitation patterns and sea-level rise, coupled with both gradual and non-linear changes to ecosystems and natural resources, suggests the need for a renewed focus on the ways that disaster risk reduction and adaptation can influence the context in which climate change occurs. Rather than creating or perpetuating contexts for disaster, it is possible to use disaster risk reduction and adaptation strategies to create a context that promotes human well-being and security.

Box 1. Definitions of Disaster Risk Reduction and Climate Change Adaptation

UNISDR[9] defines *disaster risk reduction* as "the conceptual framework of elements considered with the possibilities to minimize vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards, within the broad context of sustainable development."

The IPCC[10] defines *climate change adaptation* as "adjustments in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities."

2. Disaster Risks and Climate Change

> . . . the type, frequency and intensity of extreme events are expected to change as Earth's climate changes, and these changes could occur even with relatively small mean climate change. Changes in some types of extreme events have already been observed, for example, increases in the frequency and intensity of heat waves and heavy precipitation events.
>
> (IPCC 2007)[11]

Disaster risk and climate change are two threats to human well-being that adversely reinforce each other. Disaster risk is an intrinsic characteristic of human society, arising from the combination of natural and human factors and subject to exacerbation or reduction by human agency.[12] While the adverse impacts of climate change on society may increase disaster risk, disasters themselves erode environmental and social resilience, and thus increase vulnerability to climate change. Although the relationship between climate change and extreme events remains uncertain, it is difficult to distinguish variability and changes in climate-related hazards from the impacts of long-term climate change. Improved knowledge on the linkages between extreme weather events and climate change is needed and can facilitate strategies to reduce vulnerability. Yet it is increasingly acknowledged that both preparatory actions and responses to climate variability and long-term climate change may often be similar.[13] Consequently, there are growing calls for a common framework for approaching the reduction of vulnerability to disasters, climate variability and long-term climate change.[14]

Disasters have an enormous impact on human development. Globally, events such as earthquakes, floods, and droughts contribute to tens of thousands of deaths, hundreds of thousands of injuries, and billions of dollars in economic losses each year.[15]In developing countries, disasters represent a major source of risk for the poor and can potentially destroy development gains and accumulated wealth.[16] This has been recognized by the UN Member States in the Millennium Declaration, which sees the mounting losses caused by disasters as a major threat towards meeting the Millennium Development Goals (MDGs).[17]

Records maintained by CRED show that disaster frequency appears to be increasing, from about 100 events per decade in the 1900-1940, to 650 per decade in the 1960s, to 2000 per decade in the 1980s. By the 1990s this number had reached almost 2800 events per decade.[18] The increase in reported disasters can be partly explained by a higher number of small and medium-level events that are related to natural and human-induced or socio-natural phenomena.[19] While the number of geophysical disasters has remained fairly steady, the number of hydrometeorological disasters has increased significantly over the last decades.[20] Bouwer et al. estimate that global costs of weather-related disasters alone have increased from an annual average of USD 8.9 billion in 1977-1986 to USD 45.1 billion in the 1997-2006 period.[21] According to ICSU about three-quarters of all disasters were triggered by weather-related events during the 1990s, and floods and drought are among the most prominent causes.[22] A revised assessment of historical droughts (from 1900 to 2004) by Below et al. concludes that "more than half of all deaths associated with natural hazards are now classified as drought related, and only floods rank higher in terms of the number of people affected."[23]

The geographical distribution of hazards during 1985-2005 was examined by Dilley et al.[24] Many of the "disaster hot spots" are located in the semi-arid tropics, in coastal areas, and along geological faults. This global assessment of mortality and economic losses related to disasters emphasizes the implications for socioeconomic development, particularly the covariate losses such as partial or total loss of household assets, income, or productivity. Dilley et al.[25] stress that "[w]idespread disaster-related mortality can affect households and communities for years, decades, and even generations."

Recent research attention has also emphasized the linkages between rapid urbanization and disasters.[26] Urbanization has become the dominant feature of human settlement patterns over the past century. More than half of the world's current population lives in cities. By the year 2015 there are expected to be 60 megacities in the world, each with a population of 10 million or more people. Over the next several decades, the largest urban population changes are expected to occur in coastal areas, particularly in Asia and Africa.[27] The linkages between rapid urbanization and disasters have sometimes been described as reflexive: cities create their own risks by causing degradation of the local, regional, and global environments.[28] High concentrations of resources and people within cities also mean that the economic, social, and environmental costs of extreme events are high in urban areas.[29] Furthermore, these costs are likely to escalate as a result of growing populations in coastal cities, many of which are already highly vulnerable to sea-level rise, tsunamis, and other hazards.[30]

2.1. Climate change and extreme events

Climate change is expected to increase the frequency and magnitude of many types of extreme events, including floods, droughts, tropical cyclones and wildfires.[31] Table 1 summarizes the findings from the IPCC Fourth Assessment Report related to observed and projected changes in extreme events. New evidence also suggests that climate change is likely to change the nature of many types of hazards, not only hydrometeorological events such as floods, windstorms, and droughts, but also events such as landslides, heat waves and disease outbreaks, influencing not only the intensity, but also the duration and magnitude of these events.[32] This research suggests that there is good reason to be concerned about the dynamic, non-linear and uncertain relationships between climate variability, climate change, and extreme events, and their implications for human security.

Policy-makers, NGOs, and humanitarian agencies will require improved information about changing extremes in order to better manage changing risks and uncertainty. Nonetheless, the complexity of the climate system frustrates any simplistic conclusions about the relationship between climate change and extreme events. The difficulty and uncertainty of these relationships is exemplified by the case of tropical cyclones. Recent assessments of the relationship between climate change and cyclones produce a range of results.[33] Differences in the projected changes in hurricane activity depend on a number of factors, including location (e.g. southern vs. northern hemisphere, ocean basin, etc.). In some assessments, hurricane and tropical storm intensity is projected to increase, while in others it is projected to decrease. However, assessments indicating decreases also suggest possible increases in near-storm rainfall events, which may still present a potential challenge to disaster risk managers.[34] Statements about the frequency and magnitude of other hazards (e.g., droughts and floods) also need to be approached with caution.

New scientific literature is continually assessing and reassessing the relationship between climate change and extreme events, often raising new uncertainties.[35] However, there is a general consensus that change is expected to be the norm, rather than the exception. As stressed by Leary et al., past performance of the climate is becoming a less reliable predictor of future performance, thus future climate will be less familiar and more uncertain under climate change.[36] Milly et al. argue that in terms of water resource management, "stationarity is dead because substantial anthropogenic changes of Earth's climate is altering the means and extremes of precipitation, evapotranspiration, and rates of discharge of rivers."[37] Stationarity, which is the idea that natural systems fluctuate within an unchanging range of variability, has long been a key assumption in water resources engineering and management.

The IPCC Fourth Assessment Report also highlights new potential risks related to climate change. Table 2 summarizes some of the key vulnerabilities described by Schneider et al.[38] There are real and increasingly identified thresholds in the impacts of climate change, such as non-linear changes in ecosystems and physical systems brought about through

Table 1: Findings from the 2007 IPCC Fourth Assessment Report – The link between climate change and extreme events

Observations of changes in climate
– Widespread changes in extreme temperatures have been observed over the last 50 years (IPCC WG I, section 3.2.2.1). – Reductions in the number of frost days in mid-latitude regions, increases in the number of warm extremes and a reduction in the number of daily cold extremes (IPCC WG I, section 3.8.2.1). – Heat waves have increased in duration beginning in the latter half of the 20th century (IPCC WG I, section 3.8.2.1). – Significant increased precipitation in the eastern parts of North and South America, northern Europe and northern and central Asia (IPCC WG I, section 3.3.2.2). – Drying has been observed in the Sahel, the Mediterranean, southern Africa and parts of southern Asia (IPCC WG I, section 3.3.2.2). – Substantial increases in heavy precipitation events has been observed (IPCC WG I, section 3.8.2.2). – Increase of intense tropical cyclone activity in the North Atlantic since about 1970, correlated with increases in tropical sea surface temperatures. There is also suggestion of increased intense tropical cyclone activity in some other regions where concerns over data quality are greater (IPCC WG I, section 3.8.3.2). – More intense and longer droughts have been observed over wider areas, particularly in the tropics and subtropics since the 1970s (IPCC WG I, section 3.3.4). – Altered distribution of some infectious disease vectors (IPCC WG II, section 8.2.8).
Future climate change projections
– Increased warming with the greatest temperature increases in high northern latitudes, with less warming over the southern oceans and North Atlantic (IPCC WG I, section 10.3.2.1). – More frequent, intense and longer lasting heat waves (IPCC WG I, section 10.3.6.2). – An intensification and expansion of wildfires is likely globally (IPCC WG II, section 4.4.2-5). – Fewer, shorter, less intense cold spells/cold extremes in winter (IPCC WG I, 11.3.3.2). – Increased precipitation in high latitudes, and decreases in most subtropical land regions (IPCC WG I, 10.3.2.3). – More heavy precipitation events (IPCC WG I, section 10.3.6.1). – Increased risk of flooding (intense and heavy rainfall coupled with high runoff) (IPCC WG I, section 10.3.6.1). – Increases in areas affected by droughts (IPCC WG I, section 10.3.6.1). – Sea level is expected to continue to rise over the next several decades (IPCC WG I, sec. 10.6. 1). – More severe tropical cyclones, with greater wind speeds and more intense precipitation (IPCC WG I, section 10.3.6.3). – Widespread increase in thaw depth in most permafrost regions (IPCC WG I, section 10.3.3.2).

transitions in ecosystem function and process, often exacerbated by feedbacks at global and local scales.[39] These "key vulnerabilities" involve changes at rates at which ecosystems may not be able to adapt, as well as sea-level changes that threaten specific localities and settlements, thus they are likely to pose new challenges to disaster risk management and climate change adaptation.[40]

Table 2: Key vulnerabilities of human and biophysical systems

System	Temperature Rise +2°C to 4°C	Temperature Rise > 4°C
Water Resources	Decreased water availability and increased drought in mid latitudes	Hundreds of millions face reduced water supplies
Migration	Stresses will affect many locations; may lead to relocation within and between countries adding to migration pressures	
Biodiversity	Loss of one third of species	Widespread extinctions
Greenland Ice Sheet	Widespread to near-total deglaciation	Near-total deglaciation
West Antarctic Ice Sheet	Commitment to widespread deglaciation; increasing deglaciation with increasing temperature	

Source: Adapted from Schneider et al.[41]

2.2. Impacts of climate change

The IPCC Fourth Assessment Report from Working Group II describes a wide range of likely long-term climate impacts that will undermine human security, including increased water stress for millions of people in Africa; decreasing flows in rivers that supply water to millions in Latin America and a billion people in Asia; declining crop productivity in low latitudes, including a 50 percent decline in rain-fed yields in some parts of Africa and 30 percent decline in rain-fed yields in some parts of Central and South Asia; millions of people exposed to flooding in the densely populated and economically productive mega deltas of Asia; increasing malnutrition in low-income societies; increased deaths, diseases and injuries associated with extreme events such as droughts, floods, heatwaves, fires, and storms; decreasing yields of fish from most of the world's freshwater and coastal fisheries; and loss of lands and homes and possibly islands in many of the small island states in the South Pacific, Caribbean and Indian and Atlantic oceans.[42]

Climate change places at risk many of the basic things people need to be healthy and to live dignified lives. For example, in the low-lying atoll-country of Tuvalu, a 2ºC rise in temperature is likely to cause annual coral bleaching, changing rainfall patterns, more intense extreme events, and sea-level rise.[43] Local food production from the land and sea are likely to decline, water scarcity may increase, and coasts may erode to the point that the islands may cease to be able to sustain existing numbers of people, and in the longer-term may be subsumed.[44] In this case, climate change puts at risk basic human needs such as access to food and shelter.

Mortality due to climate change is very likely to increase further through a range of direct effects (such as more intense heat waves, floods, and fires), indirect effects (such as declines in water quality and food security, and changes in disease vectors), and through social and economic disruptions (such as increased poverty and migration).[45] Climate change is likely to exacerbate the incidence of infectious diseases such as malaria, waterborne diseases such as diarrhea

and cholera, and cardio-respiratory diseases. In Africa, for example, one estimate suggests that malaria exposure will increase by between 16 – 28 percent under a range of climate change scenarios, which is significant given that 445 million people are already exposed to malaria each year in Africa, leading to over 1.3 million deaths.[46] In relation to climate variability and extreme events, hydrometeorological extremes can have enormous impacts on livelihoods and well-being. For example, the World Bank estimated that following Hurricane Mitch, 165,000 Hondurans fell below the poverty line, the poorest lost 18 percent of their assets and 29 percent of crops were lost.[47] ERM estimated that even in the 1990s, some 35-40 percent of the worst disasters had a strong climate change signal, thus these statistics on losses are likely to increase in the absence of proactive climate change adaptation and disaster risk reduction.[48]

The private sector and their associated investments are also directly threatened by climate change. Ernst & Young describe climate change, coupled with its potential destabilizing affects linked to conflict and security, as the "greatest strategic risk facing the property and causality insurance industry."[49] Concerning the economic and financial consequences of extreme events, many studies have explored the local and regional economic impacts of specific events, such as hurricanes, floods, earthquakes, heat waves, and wild fires.[50] This research is generally focused on aggregate impacts including costs of business interruption, infrastructure damage and loss of business structures and productive capital, as well as on measures to reduce economic risks such as broader provision of private insurance, enforcement of building codes, and development of disaster preparedness plans.[51] Limited attention has been directed toward the effects of extreme events on industries, businesses, and workers, including which industries are likely to expand or contract, which firms are likely to survive, and which types of workers are likely to gain or lose jobs.[52]

Climate change may have a number of indirect effects as well. These may arise, for example, through changes in the costs of essential goods and services. Increasing water scarcity may lead to an increase in water prices; warmer temperatures are likely to influence demand for and the cost of energy for cooling; and climate-induced changes in the agricultural sector may drive up food prices. As with the direct effects of climate change, indirect effects will be unevenly distributed, with the burden falling most heavily on low-income households where a significant share of expenditures already goes towards food and energy, and where the opportunity costs of increased spending in these areas may lead to declining access to goods and services necessary to live dignified lives. Labor markets may also be affected, for example if production decreases associated with drought lead to a reduced demand for agricultural wage laborers.[53]

The human consequences of climate change have enormous implications for development, particularly for poverty reduction initiatives and global initiatives such as the Millennium Development Goals (MDGs).[55] Table 3 highlights the impacts of climate change on poverty and consequently on achievement of the MDGs. Agrawala has estimated that between 15 – 60 percent of official development assistance (ODA) flows will be affected by climate change.[56] Not only are large amounts of ODA exposed to climate risks, but also investments and infrastructure will be affected. Watson argues that the investments made by the private sector in developing countries are at an even greater risk, because adaptation options and risk spreading mechanisms remain inadequate.[57] More important, the whole public infrastructure on which these investments depend is highly vulnerable to any climate stress.

In summary, the 2007/2008 Human Development Report argues that failure to adequately address climate change now will "consign the poorest 40 percent of the world's population – some 2.6 billion people – to a future of diminished opportunity."[58] The Stern Review concurs, warning that warming above 2°C will lead to "major changes in human geography – where people live and how they live their lives."[59] Stern also cautions that inaction will lead to climate change costing about 20 percent of global GDP. Climate change is and will increasingly be a key contributor to morbidity, mortality, and poverty, particularly among populations that are resource dependent, have low incomes, and are constrained in their capacity to adapt by insufficient access to the social, environmental and economic resources needed to adapt. These effects will be most visible when combined with extreme events and disasters. In the next section, we examine the underlying factors behind vulnerability to climate change impacts and disasters.

Table 3: Impacts of climate change on poverty and the Millennium Development Goals

Changes in mean climate, variability, extreme events and sea level rise	**Impact on poverty**	**Impacts on the eight Millennium Development Goals**
Increased temperature and changes in precipitation **reduce agricultural and natural resources.** Change in precipitation, run-off and variability leads to **greater waterstress.** Increased incidence or intensity of climate-related disasters leads to **damage to assets and infrastructure** Temperature, water and vegetation changes contribute to **increased prevalence of disease**	Lowered industrial output and labour productivity, high inequality, impacts on trade, and fiscal and macro-economic burdens lead to **reduced economic growth**, and poverty- reducing effects Reduced productivity and security of **poor people's livelihood assets**, and reduced access for the poor to their livelihood assets Less effective coping strategies among the poor, and increased **vulnerability** of poor people	**1 Eradicate extreme poverty and hunger** Food security jeopardised; more intense disasters threaten livelihoods. **2 Achieve universal primary education** More vulnerable livelihoods mean more children engaged in employment; infrastructure damage from disasters. **3 Promote gender equality and empower women** Women make up two-thirds of world's poor and are more adversely impacted by disasters. **4 Reduce child mortality** Children more vulnerable to malaria and other diseases, which are spread more widely by climate change. **5 Improve maternal health** Pregnant women particularly susceptible to malaria. **6 Combat HIV/AIDS, malaria and other diseases** Increased prevalence of mosquito-borne diseases. **7 Ensure environmental sustainability** Climate change indication of unsustainable practices. Move towards more energy-efficient models of consumption. **8 Promote global partnerships** Wider forums must acknowledge the role of climate change in impacting MDGs.

Source: Mitchell and Tanner[54]

3. Vulnerability to Climate Change and Extreme Events

> …understanding who is vulnerable, and why, can help us to prevent our neighbour's home from washing into the sea, a family from suffering hunger, a child from being exposed to disease and the natural world around us from being impoverished. All of us are vulnerable to climate change, though to varying degrees, directly and through our connections to each other.
>
> (Leary et al. 2008)[60]

Climate change is associated with a myriad of socioeconomic and biophysical shifts, but potential and projected changes in climate variability, including increases in extreme event frequency or intensity, is well recognized as a central societal concern.[61] This has led to a growing body of research on the aggregate estimates of the economic and social costs of climate change in terms of human mortality and morbidity, GDP, infrastructure, and capital resources that may be affected by extreme events.[62] There is also a growing recognition of the need to prepare for and manage the effects of extreme weather events under climate change.[63] Although technical responses related to hazards and climate impacts have long been considered important, over the past decades attention has shifted to a focus on vulnerability, and particularly on the role that climate change adaptation and disaster risk reduction can play in reducing vulnerability to climate variability, hazards and extreme events.

It is important to note that definitions, conceptualizations and interpretations of vulnerability differ both between and within the disaster risk and climate change communities.[64] Several definitions of vulnerability are presented in Box 2. The IPCC definition focuses on vulnerability as a function of: 1) exposure to a climate risk; 2) sensitivity or susceptibility to damage; and 3) adaptive capacity, including the capacity to recover from impacts.[65] Vulnerability can also be explained by different causal factors, including biogeophysical and technological conditions, institutional failures, and social, economic and political conditions and inequalities.[66] A "physical vulnerability" approach emphasizes biogeophysical and technological interpretations that relate vulnerability to locations in high-risk areas (e.g., low-lying coastal areas), high concentrations of population and physical capital in small areas, a dependency on large-scale infrastructure projects, an increased risk of disease transmission due to crowded conditions, and location in fragile or vulnerable environments, such as deforested mountain slopes.[67] This hazard-centered or impact-oriented paradigm focuses largely on the physical processes underlying vulnerability to climate change and disasters. Consequently, vulnerability reduction strategies often seek to control outcomes through monitoring and predicting, as well as through engineering projects and technological interventions that contain or reduce their effects.[68] A "social vulnerability" approach, in contrast, focuses on vulnerability as the result of an interplay among many contextual factors, including biophysical, social, economic, political, institutional, technological and cultural conditions that generate unequal exposure to risk and create differential capacities to respond to both shocks and long-term changes.[69] This vulnerability context is described in more detail below.

Box 2. Definitions of Vulnerability

"Vulnerability is the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity." (IPCC 2007)[70]

"Vulnerability is the state of susceptibility to harm from exposure to stresses associated with environmental and social change and from the absence of capacity to adapt." (Adger 2006)[71]

"The conditions determined by physical, social, economic, and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards." (UNISDR 2007)[72]

"The characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard (an extreme natural event and process)." (Wisner et al. 2004)[73]

3.1. The vulnerability context

The vulnerability literature provides important insights regarding how and why some individuals, households, social groups, and public institutions are likely to be disproportionately affected by climate change, extreme events, and disasters.[74] Numerous vulnerability frameworks emphasize specific contextual factors that influence exposure and the capacity to respond to change.[75] For example, Turner et al. developed a place-based framework that focuses on the coupled human- environment system and examines how hazards can potentially affect the system.[76] Their framework recognizes that responses and their outcomes collectively determine the resilience of the coupled system and may, in fact, transcend the system or location of analysis to affect other scalar dimensions of the problem, creating potential feedbacks to the original system. Other types of vulnerability frameworks include capabilities, assets, and livelihoods approaches that focus on the factors that constrain or enable people in pursuing outcomes that they value.[77] The DFID framework on sustainable livelihoods views people as operating in a context of vulnerability, where they have access to certain assets or poverty-reducing factors that are influenced by the prevailing social, institutional, and organizational environment.[78] The Pressure and Release (PAR) model of Wisner et al.[79] explicitly discusses how "unsafe conditions" are transformed into disasters given exposure to biophysical, social, political, and economic stressors. This model describes how vulnerability is rooted in social processes and underlying causes (called dynamic pressures and root causes), which may often be quite remote from the disaster event itself.

An individual or group's vulnerability to climate change and climate-related disasters is thus influenced by the complex array of social, economic, political and environmental factors operating at a variety of levels that in combination affect vulnerability.[80] Consequently, vulnerability is not evenly distributed across society, and some individuals, households, or groups are likely to be disproportionately affected by climate change or disasters. Box 3 discusses some of the issues surrounding vulnerability of two important demographic groups; the elderly and children. Interestingly, most vulnerable people do not perceive themselves to be vulnerable – they instead refer to vulnerability in terms of "weakness," "problems," and "constraints."[81] Although structural and systemic factors can contribute considerably to vulnerability, it is recognized that people and institutions act from diverse histories and worldviews and consequently have different interpretations and perceptions of risk and vulnerability, hence they may develop differential responses to sim-

ilar conditions and processes.[82] Some individuals may consider that no risk is tolerable, and thus hold their government responsible for insulating them from all risks, whereas others may be willing or forced to live with considerable risk.[83] Nonetheless, as Hilhorst points out, "[n]arratives that people create about risk, vulnerability and disasters are not just statements about nature, but are also statements about state-society relations."[84]

In short, the possible effects of climate change extremes cannot be understood independently of larger social, economic and cultural changes. It is widely recognized within the disaster risk community that hazards themselves rarely create disasters, but instead it is the context in which the hazard occurs that contributes to disastrous outcomes.[85] This is relevant to climate change-related extreme events as well. Yet it is also important to recognize that the context in which climate extremes and hazards occur is constantly changing as the result of many factors, including rates of economic development and natural resource exploitation, urbanization, deforestation and land use changes. Among the many environmental and social processes that structure vulnerability, rising global food prices, warfare, corruption, trade dependency, macroeconomic policies, and a host of large-scale processes associated with globalization shape the social and economic entitlements that influence vulnerability.[86] There are also important path dependencies related to vulnerability; past processes such as colonization and war shape present insecurities, while ongoing processes such as climate change and changes to ecosystem services shape future insecurities.

Box 3. Children and the Elderly: Extremely Vulnerable to Extremes?

The climate change and disaster risk communities are paying increasing attention to differential vulnerability among demographic groups, particularly children and the elderly. The IPCC Fourth Assessment Report from Working Group II, for example, noted that the health risks associated with changing incidence of weather extremes were most concentrated in vulnerable populations that include the elderly and young children.[87]

More elderly will be exposed to climate change in the coming decades, particularly in OECD countries. By 2050, it is estimated that 1 in 3 people will be above 60 years in OECD countries, as well as 1 in 5 at the global scale.[88] The factors that contribute to the vulnerability of people over 60 years of age to climate change are similar to factors that make them vulnerable to hazards: deterioration of health, personal lifestyles, loneliness, poverty, or inadequate health and social structures are all elements that can contribute to vulnerability.[89] The context in which people are aging will also influence future vulnerability to climate change. This context includes changing health conditions, as well as issues of social exclusion; welfare programme reforms and their impact on the elderly income; developments in the health and social care system; and finally, the evolution of family structures.

Children constitute a very large percentage of those who are most vulnerable to climate change. The effects of extreme events, especially for the youngest children, can be long term.[90] In explaining why children as a group are particularly vulnerable to challenges associated with climate change, Bartlett points out that children are in a rapid stage of development and are less equipped to deal with deprivation and stress, due to rapid metabolisms, immature organs and nervous systems, developing cognition, limited experience and various behavioral characteristics.[91] The adversity experienced by affected children tends to be intensified by poverty and the difficult choices low-income households make as they try to adapt to hardship. With climate change and the need to handle multiple stressors at various levels, children's voices and participation in policy and decision making is likely to become even more pressing and important, as their capacity to contribute to adaptation and disaster risk reduction has been largely overlooked.[92]

Hazards and extreme events themselves can alter the context for economic and social development, which can in turn reduce the capacity to respond to future extremes.[93] Cumulative effects of events such as hurricanes, floods, or droughts not only damage or destroy material assets and human lives, but they may also influence the capacity and resilience of individuals to recover their sense of well-being. Common emotional reactions after a disaster include shock, fear, grief, anger, guilt, shame, helplessness, numbness and sadness, which in combination with cognitive reactions such as confusion, indecisiveness, worry and difficulty concentrating, can make recovery a challenge for days, weeks, months, or years following a disaster.[94] The long-term implications of post-traumatic stress disorder (PTSD) have been witnessed in the aftermath of recent disasters such as Hurricane Mitch, Hurricane Katrina, and the Asian tsunami.[95] There is also an increasing body of research assessing the prevalence and severity of children's distress after an extreme event in the months following a disaster.[96] Kar finds that high exposure, lower educational levels and middle socioeconomic status significantly predicted the outcome of PTSD.[97] Whereas the shock just after a disaster is readily evident, children and their families report that the aftermath of traumatic events and the deprivations and humiliations associated with slow recovery process are particularly stressful.[98]

Vulnerability reduction is thus recognized as an important strategy for reducing disaster risks and minimizing the impacts of climate change. However, despite increased emphasis on the importance of social, political and economic contexts, climate change adaptation and traditional disaster risk management activities remain largely delinked from vulnerability reduction.[99] In fact, a synthesis of evaluation findings on humanitarian responses to natural disasters found relatively few examples of good practices related to vulnerability reduction.[100] There tends to be, instead, a disproportionate emphasis on relief and recovery processes that prioritize a return to 'normalcy,' rather than focusing on the conditions that cause risk and vulnerability. In many cases, these 'normal' conditions are directly or indirectly contributing to risk and vulnerability.[101]

4. Disaster Risk Reduction and Climate Change Adaptation

> Holistic management of disaster risk requires action to reduce impacts of extreme events before, during and after they occur, including technical preventive measures and aspects of socio-economic development designed to reduce human vulnerability to hazards. Approaches toward the management of climate change impacts also have to consider the reduction of human vulnerability under changing levels of risk. A key challenge and opportunity therefore lies in building a bridge between current disaster risk management efforts aimed at reducing vulnerabilities to extreme events and efforts to promote climate change adaptation.
>
> (Few et al. 2006)[102]

Recognition of the linkages between climate variability, climate change, and extreme events has fostered a small but growing literature on the connections between disaster risk reduction and climate change adaptation.[103] This literature shows that there is a great potential for coordinated efforts towards addressing adaptation. The disaster risk community advocates using the tools, methods and policies of disaster risk reduction as a basis for addressing the risk aspects of climate change. Methodologies and experiences in working with vulnerable people and their needs through community-based initiatives are emerging as a cornerstone for disaster risk reduction.[104] At the same time, the climate change community offers a growing body of research and experience on adaptation as a social process, with an emphasis on strategies and measures to reduce vulnerability and enhance the capacity to adapt to shocks and stressors.[105] This includes initiatives aimed at building resilience through community-based adaptation. Given these overlapping areas of expertise and empirical experience, there have been numerous calls for increased collaboration between the two communities.

Yet strategies for disaster risk reduction and climate change adaptation have until now evolved largely in isolation from each other through different conceptual and institutional frameworks.[106] The disaster risk management community has gone through various paradigm shifts since the early 1970s.[107] Throughout these stages the "disaster" or humanitarian community has refined its practical and conceptual approach from managing disasters by addressing the hazards, to understanding and addressing the underlying factors and vulnerabilities that turn hazards into disasters, culminating in the disaster risk reduction framework.[108] The Hyogo Framework for Action (HFA) was adopted by 168 countries in 2005, and provides a technical and political agreement on the areas that needs to be addressed to reduce risk. The HFA presents five priorities for action: 1) ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation; 2) identify, assess and monitor disaster risks and enhance early warning; 3) use knowledge, innovation and education to build a culture of safety and resilience at all levels; 4) reduce the underlying risk factors; and 5) strengthen disaster preparedness for effective response at all levels.

Climate change adaptation has a somewhat shorter history, emerging in the United Nations Framework Convention on Climate Change (UNFCCC) signed in 1992. However, the UNFCCC and the Kyoto protocol predominantly addressed

climate change mitigation and policies and measures to reduce the emissions of greenhouse gases. It was not until quite recently that adaptation came to the forefront as a key concern within the UNFCCC.[109] The possibilities for Least Developed Countries to develop National Adaptation Programmes of Actions (NAPAs) and the Nairobi Work Program—a 5-year (2005-2010) initiative under the UNFCCC,[110] were important first steps towards both enhancing the understanding of adaptation and catalyzing action on adaptation. The Bali Action Plan (BAP), agreed upon at the UNFCCC Conference of Parties (COP) in Bali, provides a roadmap towards a new international climate change agreement to be concluded by 2009 as successor to the Kyoto Protocol.[111] The BAP puts adaptation on an equal footing with mitigation. In the BAP, risk management and disaster risk reduction are identified as important elements of climate change adaptation. Further, the BAP emphasizes the importance of "building on synergies among activities and processes, as a means to support adaptation in a coherent and integrated manner."[112]

No comprehensive formal scientific assessment has been undertaken yet of the research findings and empirically-based activities that are emerging from the two communities. With increased attention to climate change and associated impacts within the disaster risk community, and growing recognition of the links between disaster risk reduction and adaptation within the climate change community, there is now both a need and an opportunity to learn from the experiences of both the disaster risk and climate change research and practice. Important lessons can be drawn from such an assessment, which can be used to better inform society on how to adapt to a changing climate, and to better integrate and coordinate adaptation and disaster risk reduction across different levels of governance.[113]

What might such lessons look like? Below, we extract and discuss four points that can be gleaned from a brief review of disaster risk reduction and climate change adaptation literatures. These points illustrate the potential synergies that might emerge from a more in-depth scoping or formal scientific assessment. In section 5, we then argue that such synergies are urgently needed to guide insights and actions that increase human security in the face of climate change.

4.1. Disaster risk reduction and climate change adaptation must be closely linked to development

As the uneven distribution of impacts and opportunities presented by climate change and disasters come into sharper focus, both disaster risk reduction and climate change adaptation have become core development issues. There are instrumental concerns about minimizing threats to progress on poverty reduction and the MDGs, but also justice and equity concerns because the impacts of climate change are often hardest felt by those who have contributed least to the problem.[114] For the climate change community, a collaboration with development researchers and practitioners has already contributed to a shift from a theoretical focus on adaptation based on future scenarios of climate change, towards identifying broad policy needs and a variety of practical adaptations than can reduce vulnerability.[115] For the disaster risk community, collaboration with the development community has played an important role in identifying vulnerability reduction strategies. Enhancing collaboration across the disaster risk, climate change and development communities may be the most effective means of promoting sustainable adaptation to climate change.

However, in an analysis of the links between adaptation, disaster risk management and development, Schipper and Pelling point to the difficulty of integrating the three agendas because of the distinct sets of actors and institutions involved (see Figure 1).[116] Rather than consulting each other on common topics, these groups often "reinvent the wheel" and come up with separate frameworks within the same meta-narratives. Yet a key contribution to all of these frameworks from development researchers and practitioners is the recognition that risk reduction and adaptation strategies must be carefully tailored to individual, household and community needs. Approaches that treat communities as homogeneous (i.e., able to adapt or reduce risks as a group) are prone to failure, as are adaptation and disaster risk reduction measures that do not explicitly and simultaneously address poverty.[117]

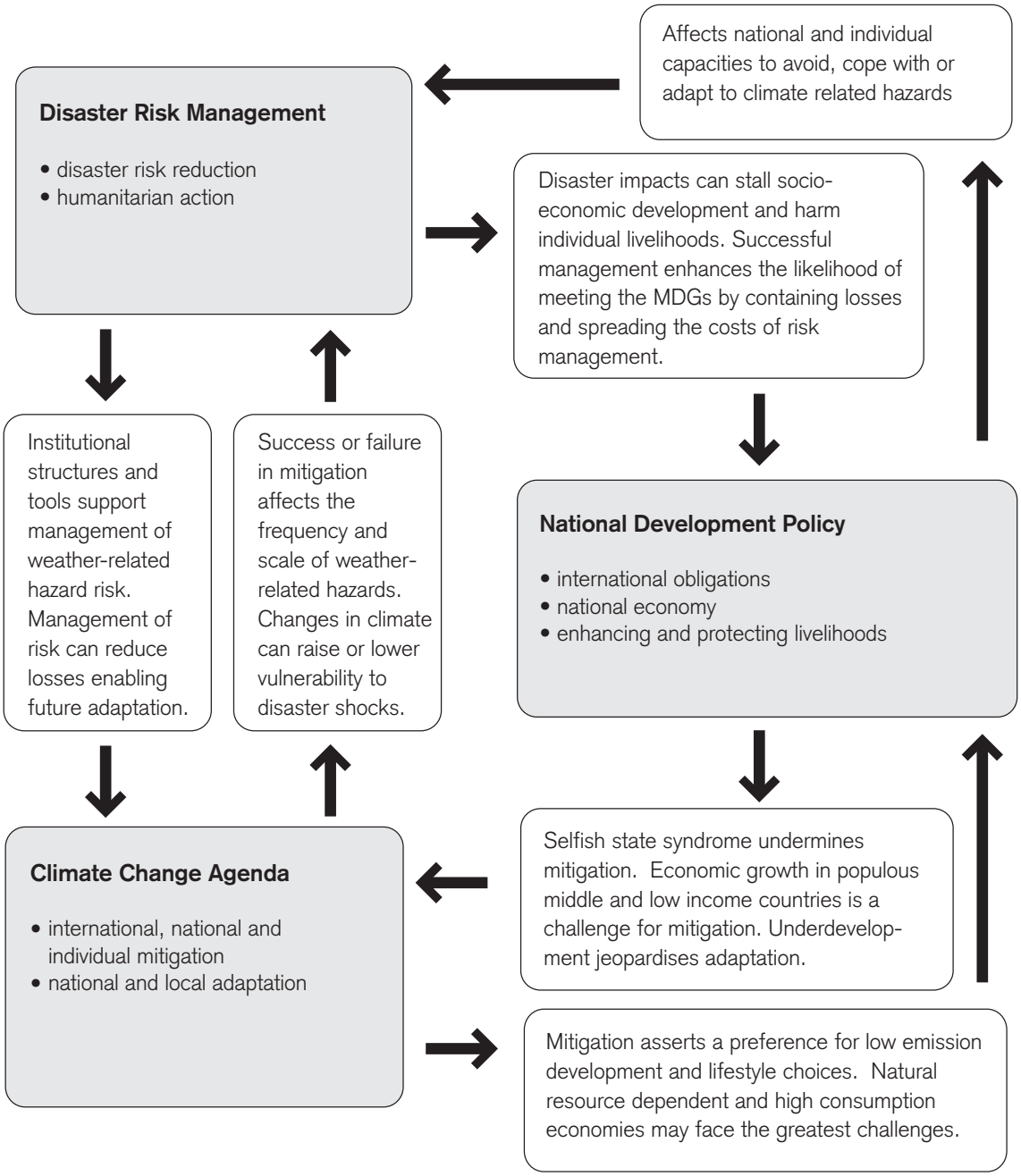

Figure 1. Relationship between disaster risk management, climate change adaptation, and national development policy

Source: Schipper and Pelling, 2006

4.2. Disaster risk reduction and climate change adaptation must address local needs

Local-level experiences can be considered the front-line of impacts from hazards and extreme events, thus they can provide important insights on the most urgent challenges associated with extreme weather events in a changing climate. The disasters community has a long history of experience in working at the local level, and a body of work on community-based adaptation is also emerging to link climate change, disaster risk reduction and development.[118] Numerous examples of local needs and challenges have emerged from community level case studies carried out in relation to both

disaster risk reduction and climate change adaptation (see Table 4). These case studies have much in common, particularly in their emphasis on vulnerability and capacity assessments at the local level to identify existing coping capacities as the basis for meeting future hazards. Such community-based assessments draw from participatory methods to link vulnerability with entitlements and access to resources, often employing a sustainable livelihoods framework.[119]

Early lessons from community-based adaptation and disaster risk reduction suggest that there is considerable potential for reducing vulnerability at the local level.[120] These lessons have stressed the need for working with trusted local intermediaries who have a firm understanding of community circumstances and dynamics, basing new activities, technologies or practices on existing coping practices. Good local development practice is crucial to the process, allowing the introduction of knowledge around current and future climate risks based on existing activities and knowledge. Addressing deficits in current coping and risk management to climate-related hazards is crucial to this approach, particularly regarding extreme events. The social vulnerability approach in particular has played a critical role in reorienting traditionally top-down methods in both disaster risk reduction and climate change adaptation towards the community or local level.[121] Engagement at the community level is underpinned by a reframing of vulnerable people not as passive victims but as capable of preventing disasters and adapting to climate change within their own communities. Bottom-up approaches promote locally-appropriate measures, empower people to change their own lives, and encourage greater ownership of disaster risk reduction and adaptation actions. Communications have been highlighted as extremely important, which suggests an emphasis on presenting knowledge in a community's own language, through innovative media, and in understandable non-scientific terms.

Table 4: Examples of major community based disaster risk reduction and adaptation tools and platforms

Tools and knowledge sharing platforms	Notes
Community Risk Assessment Toolkit ProVention Consortium www.proventionconsortium.org/?pageid=39	The toolkit draws together a diverse range of community risk assessment (CRA) methods, mainly from NGOs and community-based organizations. It documents CRA methods and applications, and assists users in identifying a method or case study of particular relevance to their context.
Climate Guide Red Cross / Red Crescent Centre on Climate Change and Disaster Preparedness http://www.climatecentre.org/downloads/File/reports/RCRC_climateguide.pdf	Highlighting the experiences of Red Cross / Red Crescent staff and volunteers, the Climate Guide provides a basic issue primer and introduces six thematic modules to work through in Red Cross/Red Crescent National Societies' activities. Each module begins with a background section with real-life experiences and perspectives, followed by a "how-to" section with specific step-by-step guidance.
Community Based Adaptation Exchange (CBA-X) IIED – Eldis www.cba-exchange.org	An initiative stemming from international workshops on community-based adaptation, CBA-X builds on the Eldis climate adaptation portfolio to support the exchange of information and experiences on community based adaptation to climate change, including case studies and tools.

4.3. Climate information must capture complexity and uncertainty to support adaptation and disaster risk reduction

Research has shown that scientists need to collaborate more closely with local knowledge networks and take into account people's risk perceptions, as well as the decision-making processes these communities use.[122] However, reducing disaster risk and vulnerability also requires close interaction between scientists who produce knowledge about changing patterns of risk and researchers and practitioners who use such information for disaster risk reduction and climate change adaptation. Currently, the spatial resolution of many climate change projections is too coarse to enable effective disaster risk reduction at the local or regional scale. The gap between climate forecasts and projections and the needs of resource managers may pose some challenges to effective responses. Past experiences with reducing risks associated with climate variability can provide some important insights into disaster risk reduction and climate change adaptation.[123] In southern Africa, for example, research has demonstrated strong linkages between El Niño Southern Oscillation (ENSO) and rainfall patterns. In particular, drought events in parts of southern Africa in the early 1980s were closely correlated to ENSO events. However, more recent evidence (particularly from the late 1990s ENSO events) suggests that the relationship between ENSO and summer rainfall does not always hold in this region, particularly at the local scale where many important livelihood decisions are made.[124]

One lesson from this area of research is that over-reliance on only one indicator (e.g., ENSO signals) can be problematic for effective disaster risk reduction and climate change adaptation. Consequently, there is a need for a better understanding of complex and compound hazards, both from physical and social perspectives. The complexity of future extreme events, which are likely to be characterized by one or more hazard that is compounded by other factors (e.g. flooding combined with a cholera outbreak that coincides with an economic crisis), requires more robust and flexible disaster risk strategies and institutional responses than has been typically used in the past. Indeed, a recent report on disaster risk reduction in sub-Saharan Africa calls for better identification, assessment and awareness of disaster risks, which will require efforts from both the disaster risk reduction community and climate scientists.[125] Communication about climate change needs to be made accessible in order to engage vulnerable people without compromising scientific credibility.[126]

4.4. There are thresholds and limits to disaster risk reduction and adaptation

There are likely to be some thresholds and limits to the potential for disaster risk reduction and adaptation to enhance human security in the face of climate change. Schneider et al. note that "the risk-reducing potential of planned adaptation is either very limited or very costly for some key vulnerabilities, such as loss of biodiversity, melting of mountain glaciers or disintegration of major ice sheets."[127] In other words, there are absolute limits that are faced by many ecosystems and individual species in adapting to new climatic conditions, particularly given constraints of urban land use and conversion of natural habitats to agriculture; over-exploitation of resources such as fisheries; and other stresses such as pollution loading to terrestrial and marine environments.[128] Hence there are major non-linearities and uncertainties related to climate change. Schneider et al. also argue that "adaptation assessments need to consider not only the technical feasibility of certain adaptations but also the availability of required resources, the costs and side effects of adaptation, the knowledge about those adaptations, their timeliness, the incentives for the adaptation actors to actually implement them, and their compatibility with individual or cultural preferences."[129] Adger et al. elaborate on this by discussing six broad categories of limits to adaptation closely linked to the rate and magnitude of climate change, as well as associated key vulnerabilities: physical and ecological limits, technological limits, informational and cognitive limits, social and cultural limits, institutional political limits, and financial limits.[130]

Financial barriers to both adaptation and disaster risk reduction have been highlighted, but primarily in policy documents around the international climate regime, rather than in scientific and economic literatures. The SBSTA body of

the UNFCCC, the Stern Review, the World Bank, OECD, Oxfam and UNDP have estimated adaptation costs for developing countries.[131] The Stern Review presents the lowest estimate of USD 4 billion per year to adapt to climate change.[132] The highest estimate is made by UNDP which estimates adaptation costs to USD 86-109 billion a year. An OECD study on the economics of adaptation demonstrates that these numbers, which have already been widely used in political statements and demand for more funds, should be handled with caution.[133] Baer, and Paavola and Adger, have discussed principles by which such estimates could be derived (compensation for damage; transfers to the most vulnerable, fair allocation and others).[134] The important point made by all of these analyses is that the costs of adaptation are significant and hence there are real financial barriers, especially in developing countries, to implementing adaptation in a sustainable manner. This area is significantly under-researched and emerging insights from public choice theory and other could be applied to enlighten the international costs of adaptation and disaster risk reduction in the context of the international strategies for mitigation.[135]

Reducing vulnerability to weather-related disasters also faces constraints associated with behavior and cognition of risk.[136] New research from social psychology, some highlighted in the IPCC Fourth Assessment Report, has shown that individuals deny risks, feel powerless to act, or have little adaptive capacity. For example, by examining elderly people's perceptions of heat wave risks, Wolf et al. show that individuals with low self-efficacy do not perceive themselves as able to act on perceived threats. Because they do not perceive their own vulnerability, they do little to adapt.[137] These studies also demonstrate that decision-making is not a uni-directional and sequential process; instead it is incremental and at times multi-directional. In other words, one step towards a decision may be contradicted by new information and experiences. This suggests that individual responses to climate change may not be as rational as many assessments of adaptive behavior assume.[138] Such findings have important consequences for both disaster risk reduction and climate change adaptation.

5. Human Security Implications of Climate Change

> …climate shocks also erode long-term opportunities for human development, undermining productivity and eroding human capabilities. No single climate shock can be attributed to climate change. However, climate change is ratcheting up the risks and vulnerabilities facing the poor. It is placing further stress on already over-stretched coping mechanisms and trapping people in downward spirals of deprivation.
>
> (UNDP 2007/2008)[139]

There is growing recognition among scientists, practitioners, and policy-makers that climate change will increase the frequency and magnitude of extreme hydro-meteorological events with potentially devastating economic and social impacts at the local and regional levels.[140] Disasters are increasing in impacts and scope, not due to hazards alone, but because of the combined effects of large-scale environmental, economic, social, demographic, and technological changes.[141] Climate change and the potential for increased disasters related to extreme events also raise critical concerns for long-term human security.[142] Human security, broadly defined, includes the means to secure basic rights, needs, and livelihoods, and to pursue opportunities for human fulfilment and development.[143] The promotion of human security is also closely linked to a "positive vision" of society that is encapsulated in notions such as well-being, quality of life, and human flourishing.[144] This positive vision has been elaborated through the capabilities approach, which emphasizes the freedom of people to choose among different ways of living, and to pursue opportunities to achieve outcomes that they value.[145]

A number of recent studies have assessed the relationship between climate change and human security, demonstrating that the linkages are often both complex and context-dependent. For example, negative impacts of climate change on food security over the medium- and long-term are likely to create greater emergency food aid needs in the future.[146]Among the most widely-discussed humanitarian and human security issues surrounding climate change are the possibilities of mass migration and/or violent conflict as the result of biophysical or ecological disruptions associated with climate change. Below, we discuss how migration and conflict, both of which are emerging as key security concerns among national governments and international institutions, are intricately tied to the vulnerability context that disaster risk reduction and climate change adaptation are targeting.

5.1. Climate change and migration

Concerning migration, disasters linked to both extreme events and more gradual changes often lead to displaced people, refugees, relocated communities, and temporary or permanent migration. The relationship between climate risk and displacement is a complex one and there are a myriad of factors that affect displacements and migration. However, recent studies suggest that climate change and associated adverse environmental impacts have the potential to trigger displacement of an increased number of people.[147] Research further suggests that the bulk of migration will take place internally in individual countries; that the majority of migration will come as a result of gradual changes in climate and not so much from individual catastrophic events;that in most cases when hydro-climatic disasters occur in developing countries they will not lead to net out-migration because people tend to return to re-establish their lives after a disaster; and that long term environmental changes are likely to cause more permanent migration.[148]

Recent studies distinguish between migration driven by 1) the increasing frequency and intensity of slow onset disasters such as drought and desertification; 2) rapid onset disasters such as floods and cyclones, and 3) incremental changes driven by sea-level rise.[149] Most studies agree that the most important climate change-related driver of migration will be sea-level rise, with the more careful assessments recognizing that the severity of migration will depend critically on the rate of localized changes in sea-level, and the degree to which adaptation takes place and is successful.[150] These studies also recognize that the rate of migration driven by sea-level rise is likely to be slow, but steady, which suggests that disaster risk reduction and adaptation strategies may help avoid humanitarian crises and political instability.

Some studies also recognize that there may be some degree of exaggeration surrounding discussions of "environmental refugees" driven by climate change, creating the danger of inappropriate policy responses that do little to ensure the rights of those most at risk from climate change.[151] While it does seem likely that climate change will be an additional contributor to migration, many studies emphasize that it is very unclear how many migrants there may be, where they may move from and to, and over what time scale. This uncertainty suggests that some of the more alarmist predictions, including those by Myers and Christian Aid, should not be used as a basis for policy.[152]

It is also widely recognized that environmental change is never a sole cause of migration, and that there are always one or more underlying economic, political or other social factors that make environmental change a proximate trigger, rather than an underlying driver of migration.[153] Whether an individual may migrate due to climate change depends on what is understood of the risks posed by climate change, and to what extent the benefits and costs arising from migration are understood by the individual.[154] Many variables shape an individual or family's decision to migrate, including factors at the point of origin, factors at the destination, intervening obstacles such as distance and institutional constraints, and personal circumstances.[155] Many studies also show that in most cases migration in response to disasters is only possible after a certain level of wealth is reached, meaning that the larger humanitarian problems may be in places where people *cannot* afford to move, rather than the places to which they do move.[156] In terms of slow-onset disasters such as drought, the evidence is more mixed: repeated drought events such as occurred in the Sahel in the 1970's and 1980's did lead to large scale migration, although it is more often the case that drought was only a trigger, with the underlying drivers being changes in livelihood systems driven by dependence on exports of a few primary commodities as a result of colonization.[157] In other cases, such as drought in Bangladesh in 1994, large-scale migration was not an outcome.[158]

It is important to point out that migration as a form of adaptation is not unproblematic. For example, if recent estimates of a 140cm rise in sea-level rise and annual coral bleaching are correct,[159] then there is little that can be done to avoid or adapt to losses of land on low-lying atoll islands, with a worst case outcome being the collapse of the ability of island ecosystems to sustain human habitation and subsequent risks to the sovereignty of the world's five atoll-island states. The result may be increases in morbidity and mortality, as well as an increased demand for migration.[160] In the Arctic, too, there is arguably little that can be done to avoid or adapt to absolute losses of snow and ice, melting of permafrost, and resultant changes in social-ecological systems.[161] As with low-lying atoll islands, increased morbidity, mortality and migration may result. In both cases there are other significant losses as well, including of place and culture and the right to a nationality and a home.[162] In each case migration cannot be seen as an 'adaptation' but rather as a loss of culture, livelihood, place and the right to a home.

5.2. Climate change and conflict

The magnitude of environmental changes expected to result from even 2°C of warming above pre-industrial levels may cause significant negative social outcomes in certain social systems—in particular low income and resource-dependent societies.In recent years there has been considerable attention to the relationship between climate change and violent

conflicts. Many studies propose that climate change heightens the risk of violent conflict between countries.[163] Others, however, are more circumspect, arguing that while there is cause for concern, there is as yet only limited research to substantiate the argument that climate change will increase violent conflict.[164] These debates notwithstanding, some recent research suggests that certain aspects of climate do influence the likelihood of violent conflict. Miguel et al. use rainfall variation as a proxy for economic growth in 41 African countries and find that decreases in rainfall strongly increase the likelihood of conflict in the following year.[165] Hendrix and Glaser, and Meier et al. also find associations between rainfall variability and violent conflict.[166] Nel and Ringharts show that rapid onset disasters related to climate and geology increase the risk of violent civil conflict, particularly in low and middle income countries.[167] All of these studies use aggregated data sets, and are not without their empirical and methodological problems as explained by Buhaug et al.[168] Yet they do indicate the possibility of a connection between climate and conflict, and justify grounds for concern about the possibility that climate change may increase the risk of violent conflict.

There is some evidence that some of the likely outcomes, such as dwindling resource stocks, a decline in livelihoods, decreasing state revenues, and increasing inequality across space and class, may create opportunities for some elites to harness resentment and mobilize people to fight, and this is more likely in states where regimes are weakened by decreasing revenues from resource-based rents or taxes.[169] If climate change causes migration, this too may be a cause of violent conflict in certain circumstances.[170]

Many studies recognize that there are multiple options for reducing the risk of conflict arising from climate change.[171] It is also important to recognize that conflicts resulting from climate change will not necessarily be violent and can instead lead to changes in the distribution of power and resources, and protection of the things that are valued. Furthermore, research on international river basins shows that issues of water access and water scarcity in many cases lead to cooperation, rather than conflict.[172] In short, the evidence about the links between environmental change and violent conflict is currently inconclusive. Neither qualitative examination of cases, nor research seeking generalizable findings based on statistical data, have produced robust findings.[173] There is, however, ample evidence that human insecurities associated with a lack of basic needs such as food, water, and shelter, limit capabilities and freedoms, and thus have negative implications for human development.[174]

6. Conclusions

> Both mitigation and adaptation should be seen as human security imperatives in a broader sense.
>
> (UNDP 2007/2008)[175]

Adaptation to climate change will be an enormous challenge for society over the next several decades. While mitigation measures are expected to reduce or slow the growth of future emissions, these efforts will not halt climatic changes that are already underway due to carbon dioxide and other greenhouse gases that are currently present in the atmosphere.[176] Key points emphasized throughout this report are that disaster risk reduction and climate change adaptation are of critical importance to the security of millions of people, and that vulnerability reduction can serve as a cornerstone for strategies to reduce the negative outcomes of climate change. There is a considerable body of knowledge on disaster risk and climate change that can be used as a basis for developing coordinated efforts for climate change adaptation. However, this literature has not yet been systematically assessed.

There are also many areas where new interdisciplinary research is needed. For example, the increasing occurrence of "complex extremes" and "complex emergencies" is likely to pose pressing challenges for the climate change adaptation and disaster risk communities and the development community at large.[177] The risk of more complex, frequent and intense extreme weather events will be exacerbated by both gradual and non-linear changes in climate and climate variability, suggesting the need for a renewed focus on the ways that disaster risk reduction and other adaptation strategies can influence the context in which climate change is experienced. Such research efforts must take into account the critical role that non-climatic factors, such as development levels, inequality, and cultural practices play in these complex extremes.[178] It is becoming clear that neither disaster risk reduction nor climate change adaptation is about addressing disasters or climate change *alone*, but rather about confronting the societal context in which these changes are occurring.[179] An assessment of the literature on disaster risk reduction and climate change adaptation represents an important first step towards identifying the strategies and frameworks for meeting present and future challenges related to climate change.

In considering the linkages between disaster risk reduction, climate change adaptation and human security, it is important to recognize that human security is not simply about freedom from conflict or prevention of population displacement.[180] Human security is closely linked to the development of human capabilities in the face of change and uncertainty. Individuals and communities faced with both rapid change and increasing uncertainty are challenged to respond in new ways that protect their social, environmental, and human rights. Considering human security as a rationale for disaster risk reduction and climate change adaptation in the face of climate change emphasizes both equity issues and the growing connections among people and places in coupled social-ecological systems.[181] Never in history has the management of threats to the environmental, social and human rights of individuals and communities been as important at local, regional and global scales, and never before have human security concerns been so closely interlinked across regions, groups, and generations. As many references cited in this report convincingly show, it is possible to reduce risk and vulnerability to disasters of our own making.

End notes

1 UNISDR, Links between Disaster Risk Reduction, Development and Climate Change (Report prepared for the Commission on Climate Change and Development, Sweden, 2008, p. 1).

2 Statement by the Norwegian Nobel Committee on awarding the 2007 Nobel Peace Prize to Intergovernmental Panel on Climate Change (IPCC) and Albert Arnold (Al) Gore Jr., October 12, 2007 (see http://nobelpeaceprize.org/eng_lau_announce2007.html).

3 CNA Corporation, National Security and the Threat of Climate Change. (Center for Naval Analyses, Alexandria, Virginia, 2007); J. Schellenhuber et al. 2007. Climate change as a security risk (German Advisory Council on Global Change (WBGU), Earthscan, UK); ; S.G. Borgerson. Arctic Meltdown. The Economic and Security Implications of Global Warming (Foreign Affairs 87/2, 2008); The Commision and the Secretary-General/High Representative,Climate Change and International Security (Paper form the High Representative and the European Commision to the European Council. Council of the European Union, 2008).

4 GECHS, Science Plan: Global Environmental Change and Human Security Project (Bonn: International Human Dimensions Programme (IHDP), 1999).

5 R.M. Leichenko and K.L. O'Brien. Environmental Change and Globalization: Double Exposures (New York: Oxford University Press, 2008).

6 H. Auld, Disaster risk reduction under current and changing climate conditions (WMO Bulletin, 57, 118-125, 2008); P. Venton & S. La Trobe. Linking climate change adaptation and disaster risk reduction (TEARFUND, 2008) ; F. Thomalla et al. Reducing hazard vulnerability: towards a common approach between disaster risk reduction and climate adaptation (Disasters 30/ 1, pp. 39-48, 2006); M. Helmer and D. Hilhorst, Natural disasters and climate change (Disasters 30/ 1, pp. 1-4, 2006).

7 W. N. Adger, T.A. Benjaminsen, K. Brown, and H. Svarstad, Advancing a Political Ecology of Global Environmental Discourses (Development and Change 32: 681-715, 2001); Leichenko and O'Brien (2008).

8 L. Schipper and M. Pelling, Disaster risk, climate change and international development: Scope for, and challenges to, integration (Disasters 30, 19–38, 2006).

9 UNISDR Basic Terms of Disaster Risk Reduction (UNISDR, http://www.unisdr.org/eng/library/lib-terminology-eng%20home.htm , Accessed 24 August 2008).

10 M.L. Parry, et al., Eds., Climate Change 2007: Impacts, Adaptation and Vulnerability (Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge, UK, 976, 2007b).

11 IPCC 2007b, p. 783.

12 UNISDR (2008).

13 W.N. Adger et al. Adaptation to climate change in the developing world (Progress in Development Studies 3, 179-195, 2003).

14 L. Schipper, Two roads become one? Exploring the linkages between climate change adaptation and disaster risk reduction (Draft Background paper prepared for the Harbin Alliance, 2008).

15 DFID, Disaster risk reduction: a development concern (London: Department for International Development, 2004); D. Stromberg, Natural disasters, economic development, and humanitarian aid (The Journal of Economic Perspectives, 21/3, 199-222, 2007).

16 M. Dilley et al. Natural disaster hotspots: a global risk analysis (Disaster Risk Management Working Paper Series No. 5. The World Bank, Hazard Management Unit, Washington DC: 2005).
17 United Nations, Millennium Declaration (New York, 2000).
18 See http://www.cred.be.
19 UNISDR, Disaster risk reduction: global review (Report prepared for the First Session of the Global Platform for Disaster Risk Reduction, Geneva, 5-7 June, 2007).
20 IFRC. World Disasters Report 2002: Focus on Reducing Risk (International Federation of Red Cross and Red Crescent Societies, Geneva, 2002).
21 L.M. Bouwer, et al. Confronting disaster losses (Science, 318/11, 753, 2007).
22 ICSU, A Science Plan for Integrated Research on Disaster Risk: Addressing the challenge of natural and human-induced environmental hazards (International Council for Science, 2008).
23 R. Below et al. Drought related disasters: A global assessment (Journal of Environment and Development 16, 328-344, 328, 2007).
24 Dilley et al. (2005).
25 Dilley et al. (2005, p. 23).
26 R. Sanchez-Rodriguez, et al. Science Plan: Urbanization and Global Environmental Change (Bonn, Germany: International Human Dimensions Programme on Global Environmental Change 2005).
27 Sanchez-Rodriguez et al. (2005).
28 J.K. Mitchell, Crucibles of Hazards: Megacities and Disasters in Transition (Toyko: United Nations University Press 1999); J.K. Mitchell, Megacities and Natural Disasters: A Comparative Analysis (GeoJournal 49/2, 137-142, 1999); J.E. Hardoy, et al. Environmental Problems in an Urbanizing World. (London: Earthscan. 2001); M. Pelling, The Vulnerability of Cities: Natural Disasters and Social Resilience (London, Earthscan, 2003); M. Pelling, ed. Natural Disasters and Development in a Globalizing World (London: Routledge, 2003); Sanchez-Rodriguez et al. (2005).
29 E. Klinenberg, Heat Wave: A Social Autopsy of Disaster in Chicago (Chigago: University of Chicago Press, 2002); F Kraas, Megacities as Global Risk Areas (Petermanns Geographische Mitteilungen 147/4, 6–15, 2003); Pelling (2003); J.K Mitchell, Urbanization and Global Environmental Change: Integrative Science or Communicative Discourses? (International Conference on the Urban Dimensions of Environmental Change: Science, Exposures, Policies, and Technologies, Shanghai, June 25–28, 2004); Leichenko and O'Brien (2008).
30 R.J.T. Klein and R.J. Nicholls, Assessment of Coastal Vulnerability to Climate Change (Ambio 28/2, 182–187, 1999); G. McGranahan, et al. The Rising Tide: Assessing the Risks of Climate Change and Human Settlements in Low Elevation Coastal Zones (Environment and Urbanization 19/1, 17-37, 2007); S. Huq, et al. Editorial: Reducing Risks to Cities from Disasters and Climate Change (Environment and Urbanization 19/1, 3-15, 2007); K.L. O'Brien et al. Beyond Semantics: Why Conceptualizations of Vulnerability Matter in Climate Change Discourses (Climate Policy, 2007).
31 Intergovernmental Panel on Climate Change (IPCC). 2007a. Climate Change 2007: The Physical Science Basis. (Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, S. Solomon, D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.), Cambridge University Press, Cambridge).
32 Leichenko and O'Brien 2008; P.J. Milly, et al. Stationarity Is Dead: Whither Water Management? (Science, 319 (5863), 573–574, 2008); Z.W. Kundzewicz, M. Radziejewski and I. Pinskwar. Precipitation extremes in the changing climate of Europe. (Climate Research, 31, 51–58, 2006).)
33 See R.A. Kerr, Hurricanes Won't Go Wild, According to Climate Models (Science 320, 999, 2008); T.R. Knutson et al. Simulated Reduction in Atlantic Hurricane Frequency Under Twenty-First-Century Warming Conditions (Nature

Geoscience 1/6, 359-364, 2008); K. Emanuel, et al. Hurricanes and Global Warming. Results from Downscaling IPCC AR4 Simulations, Bull (American Meteorological Society 89/3, 347-367, 2008).

34 See T.R. Knutson, J.J., Sirutis, S.T., Garner, G.A., Vecchi, and I.M., Held, Simulated reduction in Atlantic hurricane frequency under twenty-first-century warming conditions (Nature Geoscience, 1/6, 359-364, 2008).

35 J. Alcamo, M. Floerke and M. Maerker, Future long-term changes in global water resources driven by socio-economic and climatic changes (Hydrological Sciences, 52/2, 247-275, 2007); G. Wang, G., Agricultural drought in a future climate: Results from 15 global climate models participating in the IPCC 4th Assessment (Climate Dynamics 25, 739–753 2005).

36 N.J. Leary et al. Assessment of impacts and adaptation to climate change: final report of the AIACC project. How will the poor be affected by climate change? (Global Change System for Analysis, Research and Training. 250 p., 2007).

37 Milly, et al. (2008).

38 S.H. Schneider et al. Assessing Key Vulnerabilities and the Risk from Climate Change (In M.L. Parry, O.F. Canziani, J.P. Palutikof, C.E. Hanson and P.J. van der Linden (eds). Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press: Cambridge, 779-810, 2007).

39 See D.G. Vaughan, et al. Recent Rapid Regional Climate Warming on the Antarctic Peninsula (Climatic Change 60, 243-274, 2003); M. Scheffer, et al. Positive Feedback Between Global Warming and Atmospheric CO2 Concentration Inferred from Past Climate Change (Geophysical Research Letters 33, L10702, 2006).

40 Schneider, et al. (2007).

41 Schneider, et al. (2007).

42 IPCC (2007b).

43 Donner et al. Global assessment of coral bleaching and required rates of adaptation under climate change (Global Change Biology, 11/12, 2251-2265, 2005).

44 J. Barnett and W.N. Adger, Climate Dangers and Atoll Countries (Climatic Change 61, 321-337, 2003).

45 U. Confalonieri, Menne, B. Akhtar, R. Ebi, K. L. Hauengue, M. Kovats, R. S. Revich, B. and Woodward A., Human health (In Parry, M. Canziani, O. Palutikof, J. van der Linden, P. and Hanson, C. (eds.). Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge: Cambridge University Press: pp. 391 – 431, 2007).

46 T. Nchinda, Malaria: A Reemerging Disease in Africa (Emerging Infectious Diseases 4/3, 398-403, 1998); F. Tanser et al. Potential Effect of Climate Change on Malaria Transmission in Africa (The Lancet 362/9398, 1792-1798, 2003).

47 World Bank, The Environment and the Millennium Development Goals (Washington, D.C.: World Bank, 2002).

48 Environmental Resource Management (ERM), Predicted impact of global climate change on poverty and the sustainable achievement of the Millennium Development Goals (Report prepared for DFID by Environmental Resources Management, Reference 8409, London, 2002).

49 Ernst & Young, Strategic business risk 2008. (Insurance Report, 2008) http://www.ey.com/Global/assets.nsf/International/Industry_Insurance_StrategicBusinessRisk_2008/$file/Industry_Insurance_StrategicBusinessRisk_2008.pdf; See also http://www.cimaglobal.com/cps/rde/xchg/live/root.xsl/1630_11502.htm?itemid=18510124&categoryname=Strategic%20risk.

50 See R.A. Pielke Jr. Normalized hurricane damage in the United States: 1900–2005 (Natural Hazards Review (February), 29-42, 2008); Y. Zhang et al. Vulnerability of community businesses to environmental disasters (Disasters (on-line, May 22) 2008: DOI: 10.1111/j.1467-7717.2008.01061.x); R. Jarmin and J. Miranda, The impact of hurricanes Katrina, Rita, and Wilma on business establishments: A GIS approach (Working Paper 06-23, Center for

Economic Studies, Washington, DC. 2006); Y. Okuyama and S Chang (eds), Modeling Spatial and Economic Impacts of Disasters (Springer (6-12-08) 2004).

51 Zhang et al. (2008); W. Nordhaus, The Economics of Hurricanes in the United States (Department of Economics, Yale University. Working Paper 2006); Association of British Insurers (ABI), Financial Risks of Climate Change (Summary report, London: ABI. 40 p. 2005); Okuyama and Chang (2004); D. Flynn, The impact of disasters on small business disaster planning: A case study (Disasters 31, 508-15, 2007); C. Benson and E.J. Clay, Understanding the economic and financial impacts of natural disasters (Washington DC: World Bank, Disaster Risk Management Series No. 4. 134 p. 2004).

52 Flynn (2007); Jarmin and Miranda (2006); K.M. Tierney et al. (eds), Facing the Unexpected: Disaster Preparedness and Response in the United States (Joseph Henry Press: Washington, D.C, 2001).

53 K.L. O'Brien and R. Leichenko, Double Exposure: Assessing the Impacts of Climate Change Within the Context of Economic Globalization (Global Environmental Change 10/3, 221-232, 2000; H. Eakin and A. Luers, Assessing the Vulnerability of Social-Ecological Systems (Annual Review of Environment and Resources 31, 365-394, 2006).

54 T. Mitchell and T.M. Tanner, Adapting to Climate Change: Challenges and opportunities for the development community (IDS and Tearfund, Teddington, UK, 2006).

55 DFID, Working internationally to tackle climate change (In Eliminating World Poverty: Making Governance work for the Poor, A White Paper on International Development, DFID: London, 2006).

56 Agrawala, S. (ed), Bridge over troubled waters. Linking climate change and development (Paris: Organization for Economic Co-operation and Development, 2005).

57 R. Watson, Costs and benefits of addressing the climate change challenge (Presentation at the Meeting of climate experts and development practitioners, September 26, 2006).

58 UNDP, Fighting Climate Change: Human Solidarity in a Divided World(2007/2008 Human Development Report, 2008).

59 N. Stern, The Economics of Climate Change: The Stern Review (New York: Cambridge University Press, 2006).

60 N. Leary, C. Conde, J. Kulkarni, A. Nyong, and J. Pulhin (eds). Climate change and vulnerability. (Earthscan, London, 2008, p. 3).

61 D. Liverman, Assessing impacts, adaptation and vulnerability: Reflections on the Working Group II Report of the Intergovernmental Panel on Climate Change (Global Environmental Change 18/1, 4-7, 2008); Stern (2006); Bouwer et al. (2007); Association of British Insurers (ABI) (2005); S. Changnon, Present and future economic impacts of climate extremes in the United States (Environmental Hazards 5, 47-50, 2003); M.M.Q. Mirza, Climate change and extreme weather events: can developing countries adapt? (Climate Policy, 3/3233-248, 2003).

62 M. Beniston, Linking extreme climate events and economic impacts: Examples from the Swiss Alps (Energy Policy 35, 5384–5392, 2007; S. Hallegatte et al. Why economic dynamics matter in assessing climate change damages: Illustration on extreme events (Ecological Economics 62, 330 – 340, 2007); Stern (2006); R.A. Pielke Jr, Future economic damage from tropical cyclones: Sensitivities to societal and climate changes (Phil. Trans. R. Soc. A, 365, 2717–2729, 2007; H, Toya and M. Skidmore, Economic development and the impacts of natural disasters (Economics Letters, 20-25, 2007); W. Nordhaus, The Economics of Hurricanes in the United States (Department of Economics, Yale University. Working Paper 2006); C. Benson and E.J. Clay, Understanding the economic and financial impacts of natural disasters (Washington DC: World Bank, Disaster Risk Management Series No. 4. 134 p, 2004); see http://www.cred.be/.

63 UNISDR (2008); Auld (2008); Venton and La Trobe (2008); F. Thomalla et al. Reducing hazard vulnerability: towards a common approach between disaster risk reduction and climate adaptation (Disasters 30/1, 39-48, 2006; M. Helmer and D. Hilhorst, Natural disasters and climate change (Disasters 30/1, 1-4, 2006).

64 Schipper (2008); O'Brien et al. (2007).

65 J.J. McCarthy, O.F. Canziani, N.A. Leary, D.J. Dokken, and K.S. White, eds, Climate Change 2001: Impacts, Adaptation & Vulnerability (Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). Cambridge: Cambridge University Press, 2001).

66 T. Cannon, Vulnerability Analysis and the Explanation of "Natural" Disasters (Disasters, Development, and Environment, ed. Ann Varey, 3–30. Chichester: John Wiley, 1994; K. Hewitt, Regions of Risk. A Geographical Introduction to Disasters (Harlow: Addison Wesley Longman, 1997); Mitchell (1999b); D. Mileti, Disasters by Design: A Reassessment of Natural Hazards in the United States (Washington, D.C.: Joseph Henry Press, 1999); F. Kraas, Megacities as global risk areas (Petermanns Geographische Mitteilungen, 147, 6–15, 2003); Pelling (2003a); D. Hilhorst, Complexity and Diversity: Unlocking Social Domains of Disaster Response (In Mapping Vulnerability: Disasters, Development & People, ed. G. Bankoff, G. Frerks and D. Hilhorst52–66. London: Earthscan, 2004); K.M. O'Neill, Rivers by Design; State Power and the Origins of U.S. Flood Control (Durham, NC: Duke University Press, 2006).

67 Mitchell (1999b).

68 Hilhorst (2004).

69 Cannon (1994); Bankoff et al. (2004); J.T. Roberts and B. Parks, A Climate of Injustice: Global Inequality, North-South Politics, and Climate Policy (Cambridge: MIT Press, 2006).

70 IPCC (2007b, p. 27).

71 W.N. Adger, Vulnerability (Global Environmental Change 16/3, 268-281. p. 268, 2006).

72 UNISDR (2007).

73 B. Wisner et al. At Risk: Natural Hazards, people's Vulnerability and Disasters (2nd ed) (London and New York: Routledge, 2004).

74 Leichenko and O'Brien (2008); Committee on Disaster Research in the Social Sciences: Future Challenges and Opportunities, National Research Council (Facing hazards and disasters: understanding human dimensions. The National Academies Press, 2006); Schipper and Pelling (2006); G. O'Brien, et al. Climate change and disaster management (Disasters, 30/1, 64-80, 2006); K.L. O'Brien, et al. Mapping Vulnerability to Multiple Stressors: Climate Change and Globalisation in India (Global Environmental Change 14/4, 303-313, 2004); Tierney et al. (2001); Wisner, et al. (2004); C. Polsky, et al. Building comparable global change vulnerability assessments: The vulnerability scoping diagram (Global Environmental Change 17/3-4, 472-485, 2007); W.N. Adger, Vulnerability (Global Environmental Change 16/3, 268-281, 2006); D. Schröter, et al. Assessing vulnerability to the effects of global change: An eight step approach (Mitigation and Adaptation Strategies for Global Change 10, 573–595, 2004); S.L. Cutter and C. Finch, Temporal and spatial changes in social vulnerability to natural hazards (PNAS 105, 2301-2306, 2008); S. Eriksen and P.M. Kelly, Developing Credible Vulnerability Indicators for Climate Adaptation Policy Assessment (Mitigation and Adaptation Strategies for Global Change 12(4), 495–524, 2007); S.C. Moser, Impact assessments and policy responses to sea-level rise in three US states: An exploration of human-dimension uncertainties (Global Environmental Change 15, 353-369, 2006); K.M. O'Neill, Rivers by Design; State Power and the Origins of U.S. Flood Control (Durham, NC: Duke University Press, 2006); G. Bankoff, et al. (eds) Mapping Vulnerability: Disasters, Development and People (London: Earthscan. 236 p., 2004); Pelling 2003a; Mitchell 1999a; D. Mileti, Disasters by Design: A Reassessment of Natural Hazards in the United States (Washington, D.C.: Joseph Henry, 1999); K. Hewitt, Regions of Risk, A Geographical Introduction to Disasters (Harlow, Essex: Longman, 1997); Eakin and Luers (2006).

75 B.L. Turner II, A Framework for Vulnerability Analysis in Sustainability Science (PNAS 100/14, 8074–8079, 2003a; Wisner, et al. (2004); C. Ionescu, et al. Towards a Formal Framework of Vulnerability to Climate Change (Potsdam, PIK, 2005); A.L. Luers, The Surface of Vulnerability: An Analytical Framework for Examining Environmental

Change (Global Environmental Change 15, 214–223, 2005); Eakin and Luers (2006); Eriksen and Kelly (2007); O'Brien et al. (2007).

76 Turner, et al. (2003).

77 C.O.N. Moser, The Asset Vulnerability Framework: Reassessing Urban Poverty Reduction Strategies (World Development 26/1, 1–19, 1998; A. Sen, Development as Freedom (New York: Anchor Books, 1999); DFID. Sustainable Livelihood Fact Sheets: Introduction. (London: U.K. Department for International Development, 1999: Accessed 18 August 2008 http://www.livelihoods.org/info/guidance_sheets_pdfs/section1.pdf); G. Wood, Staying Secure, Staying Poor: The "Faustian Bargain (World Development 31/3, 455–471, 2003).

78 DFID (1999).

79 Wisner et al. (2004).

80 Eakin and Leurs (2006); Leichenko and O'Brien (2008).

81 Heijmans and Victoria, 2001, cited in Z. Delica-Willison and R. Willison 2004, Vulnerability Reduction: A Task for the Vulnerable People Themselves. (In G. Bankoff, G. Frerks, D. Hilhorst, eds., Mapping Vulnerability: Disasters, Development & People. London: Earthscan, pp. 145-158, 2004); J. Wolf et al. Conceptual and practical barriers to adaptation: An interdisciplinary analysis of vulnerability and response to heat waves in the UK (In Adger, W.N., Lorenzoni I. and O'Brien K. (eds.) Adapting to Climate Change: Thresholds, Values, Governance. Cambridge: Cambridge University Press , in press.)

82 Hilhorst (2004).

83 UNISDR (2008).

84 Hilhorst (2004, p. 61).

85 Wisner et al. (2004); Pelling (2003a); Bankoff et al. (2004).

86 W.N. Adger and M.Kelly, Social vulnerability to climate change and the architecture of entitlements. (Mitigation and Adaptation Strategies for Global Change, 4, 253-266, 1999).

87 Confalonieri et al. (2007).

88 United Nations, World Population Ageing 1950 – 2050. Executive Summary (New York: United Nations, Department of Economic and Social Affairs, Population Division, 2002).

89 OECD, Declaration on integrating climate change adaptation into development cooperation. Paris, 2006).

90 S. Bartlett, Climate Change and Urban Children: Impacts and Implications for Adaptation in Low and Middle Income Countries (Human Settlements Discussion Paper – Climate Change 2, 2008).

91 Bartlett (2008).

92 K. Haynes, et al. Children's voices for disaster risk reduction: lessons from El Salvador and the Philippines (IDS working paper, Brighton, IDS, 2008).

93 Leichenko and O'Brien (2008).

94 K. O'Brien et al. Hurricane Katrina Reveals Challenges to Human Security (GECHS AVISO NO. 14, 2005); F. H. Norris, Range, Magnitude, and Duration of the Effects of Disasters on Mental Health (Review Update 20, 2005).

95 O'Brien et al. (2005).

96 N. Kar, et al. Post-traumatic Stress Disorder in Children and Adolescents One Year After a Super-Cyclone in Orissa, India: Exploring Cross-Cultural Validity and Vulnerability Factors. (BMC Psychiatry 14/7, 8, 2007).

97 Kar (2007).

98 Barlett (2008).

99 Schipper (2008).

100 K. Stokke, Humanitarian response to natural disasters: a synthesis of evaluation findings (Synthesis Report 1/2007. Norwegian Agency for Development Cooperation (Norad), 2007).

101 Schipper (2008).

102 R. Few, R. et al., Linking climate change adaptation and disaster management for sustainable poverty reduction (Synthesis Report for Vulnerability and Adaptation Resource Group, 2006).

103 Schipper, (2008); UNISDR (2008); Venton and La Trobe (2008); Helmer and Hilhorst (2006); O'Brien et al. (2006); Schipper and Pelling (2006); S. Hallegatte, Accounting for extreme events in the economic assessment of climate change (FEEM Working Paper No. 01.05, 2005); ProVention Consortium, Harmonization Portal: Exploring synergies between Climate Change Adaptation and Disaster Risk Reduction, 2008, http://www.proventionconsortium.org/?pageid=95.

104 LCA, Reducing Disaster Risk while Adapting to Climate Change (LCA Discussion Background Paper2); UNISDR, Links between Disaster Risk Reduction, Development and Climate Change (Report prepared for the Commission on Climate Change and Development, Sweden, 2008).

105 E. Penning-Rowsell, `Signals' from pre-crisis discourse: Lessons from UK flooding for global environmental policy change? (Global Environmental Change 16, 323-339, 2006); E.L. Tompkins, Planning for climate change in small islands: Insights from national hurricane preparedness in the Cayman Islands (Global Environmental Change Part A 15/2, 139-149, 2005); L.O. Næss, et al. Institutional adaptation to climate change: flood responses at the municipal level in Norway (Global Environmental Change Part A, 15/2, 125-138, 2005).

106 See F. Yamin, et al. Vulnerability, Adaptation and Climate Disasters: A Conceptual Overview (In Yamin, F. and Huq. S. Vulnerability, Adaptation and Climate Disasters. Institute of Development Studies Bulletin Volume 36, Number 4, October 2005)

107 Hilhorst (2004).

108 UNDP, A Climate Risk Management Approach to Disaster Reduction and Adaptation to Climate Change (UNDP Expert Group Meeting Integrating Disaster Reduction with Adaptation to Climate Change, Havana, 2002 there are two UNDP 2002; LCA 2006.

109 UNFCCC, Climate Change: Impacts, vulnerabilities and adaptation in Developing Countries (Climate Change Secretariat, UNFCCC, Bonn, 68p, 2007).

110 UNFCCC, The Nairobi work programme on impacts, vulnerability and adaptation to climate change (Climate Change Secretariat, UNFCCC, Bonn, 16p, 2007).

111 See UNFCCC: http://unfccc.int/adaptation/items/4159.php.

112 UNFCCC (2007, p. 3).

113 Yamin et al. (2005); S. Huq, et al. Reducing risks to cities from disasters and climate change (Environment and Urbanization, 19/1, 39-64, 2007); E. Polack and E. Choi, Building climate change resilient cities (In-Focus 2/6, Institute for Development Studies (IDS), UK, 2007).

114 Polack, E. 2008 forthcoming. A right to adaptation: securing the participation of marginalized groups (In Tanner, T. and Mitchell, T. (eds) Poverty in a changing climate, IDS Bulletin, 2008); International Council on Human Rights Policy (ICHRP). 2008. Climate change and human rights: a rough guide Versoix, Switzerland; T.M. Tanner and T. Mitchell (eds.), Poverty in a Changing Climate (IDS Bulletin 39/4, Institute of Development Studies, University of Sussex, UK, 2008b); W. N. Adger et al. Assessment of adaptation practices, options, constraints and capacity (In Parry, M. L., Canziani, O. F., Palutikof, J. P., Hanson, C. E. and van der Linden, P. J. (eds) Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press: Cambridge, pp. 719-743, 2008).

115 K. Ulsrud et al. More than rain: Identifying sustainable pathways for climate adaptation and poverty reduction (Report prepared by GECHS for the Development Fund, 2008).

116 Schipper and Pelling (2006).

117 Tanner and Mitchell (2008a); Tanner and Mitchell (2008b).

118 ProVention Consortium, Tools for Mainstreaming Disaster Risk Reduction (Guidance Notes for Development Organisations 2007) http://www.proventionconsortium.org/?pageid=37&publicationid=132#132; S. Huq and H. Reid, Community-Based Adaptation. A Vital Approach to the Threat Climate Change Poses to the Poor (IIED Briefing Papers, IIED, London, 2007); See www.cba-exchange.org.

119 M.K . van Aalst, et al. Community level adaptation to climate change: The potential role of participatory community risk assessment (Global Environmental Change, 18/1, 165-179, 2008); A. Sen, Poverty and Famines: An Essay on Entitlement and Deprivation (Oxford: Oxford University Press, 1981); Wisner et al. (2004); D. Carney (ed.), Sustainable Rural Livelihoods: What Contribution Can We Make? DFID, London, UK, 1998.

120 See www.cba-exchange.org; Huq and Reid, (2007).

121 Adger (2006); Wisner et al. (2004).

122 F. Sperling, et al. Transitioning to Climate Resilient Development: Perspectives from Communities in Peru (World Bank Environment Department papers, n° 115, 2008).

123 K.L. O'Brien, K.L. and H.C. Vogel, Coping with climate variability: The use of seasonal climate forecasts in Southern Africa (Aldershot: Ashgate Publishing, 2003).

124 W.A. Landman and S.J. Mason, Change in the association between Indian Ocean sea-surface temperatures and rainfall over South Africa and Namibia (International Journal Climatology, 19, 1477-1492, 1999); J.C. Reason, Seasonal to decadal prediction of southern African climate and its links with variability in the Atlantic Ocean (Bulletin of the American Meteorological Society, 87, 7, 941-955, 2006).

125 African Union et al. Report on the Status of Disaster Risk Reduction in the Sub-Saharan Africa Region (Report 2008).

126 A. Patt, Effects of seasonal climate forecasts and participatory workshops among subsistence farmers in Zimbabwe (Proceedings of the National Academy of Sciences, 102, 12623-12628, 2005).

127 Schneider et al. (2007).

128 L.J. Gordon, et al. Agricultural modifications of hydrological flows create ecological surprises (Trends in Ecology & Evolution, 23, 211-219, 2008); T.E. Lovejoy and L.J. Hannah (Eds), Climate Change and Biodiversity (Yale University Press: New Haven, 2005).

129 Schneider et al. (2007).

130 Adger et al. (2007).

131 UNFCCC (2007); Stern Review (2006); World Bank. An Investment Framework for Clean Energy and Development: A Progress Report (DC2006-0012. Washington, DC: The World Bank, 2006); Oxfam, Adapting to Climate Change: What's Needed in Poor Countries and Who Should Pay. (Oxfam Briefing Paper 104, 2007). OECD, Economic aspects of adaptation to climate change: an assessment of costs, benefits, and policy instruments (Working Party on Global and Structural Policies. ENV/EPOC/GSP(2008)7. Paris: OECD, 2008); UNDP. 2007. Fighting climate change: Human solidarity in a divided world. Human Development Report 2007/2008, New York, UNDP, 2007.

132 Stern Review (2006).

133 OECD (2008).

134 P. Baer, 2006. Adaptation: Who Pays Whom (IIn Fairness in Adaptation to Climate Change, (Eds.) W. N. Adger, J. Paavola, S. Huq & M. J. Mace, Cambridge Mass.: MIT Press); J. Paavola and W.N. Adger, Fair adaptation to climate change (Ecological Economics 56/4, 594-609, 2006).

135 See A. Ulph and D. Ulph, Climate change—environmental and technology policies in a strategic context (Environmental and Resource Economics, 37, 159-180, 2007).

136 T. Grothmann and A. Patt, Adaptive capacity and human cognition: the process of individual adaptation to climate change (Global Environmental Change Part A 15/3, 199-213, 2005); S. Marx, et al. Communication and mental

processes: experiential and analytic processing of uncertain climate information (Global Environmental Change, 17, 47-58, 2006).

137 Wolf et al., (2009).

138 Grothmann and Patt (2005).

139 UNDP (2007/2008, p. 8).

140 Stern (2006); Bouwer et al. (2007); ABI (2005).

141 Leichenko and O'Brien (2008); Pielke Jr (2007); A. Oliver-Smith, Disasters and forced migration in the 21st Century (In Social Science Research Council, Understanding Katrina: Perspectives from the Social Sciences, 2006). Accessed 15 June 2007 http://understandingkatrina.ssrc.org/Oliver-Smith/; Kraas (2003).

142 J. Barnett and W.N. Adger, Climate change, human security and violent conflict (Political Geography 26/6, 639-655, 2007); A. Carius, et al. Climate change and security: challenges for German Development Cooperation (Deutsche Gesellschaft fur Technische Zusammenarbeit (GTZ) GmbH: Eschborn, 2008).; J.Schreffran , Climate Change and Security (Bulletin oft he Atomic Scientists 64/2, 19-25, 2008).

143 K.L. O'Brien and R.M. Leichenko. Human Security, vulnerability, and sustainable adaptation. (Background Paper commissioned for the Human Development Report 2007/2008: Fighting Climate Change: Human Solidarity in a Divided World. New York: UNDP, 2007).; S. Khagram, W. Clark, and D. Riras Raad, From the environment and human security to sustainable security and development. (Journal of Human Development, 4/2, 289-313, 2003).

144 R. Lister, Poverty (Cornwall, UK: Polity Press, 2004).

145 Sen (1999, p. 291).

146 M. J. Cohen, Food Security: Vulnerability Despite Abundance (Coping with Crisis Working Paper Series, International Peace Academy, July 2007).

147 V. Kolmannskog, Future floods of refugees: A comment on climate change, conflict and forced migration (Report by the Norwegian Refugee Council, Oslo, Norway, 2008); E. Ferris, Making sense of climate change, natural disasters and displacement: a work in progress. (Lecture at the Calcutta Research Group Winter Course, 14 December 2007. Washington DC: Brookings Institution. 13 p, 2007).

148 E. Piguet, Climate change and forced migration (Research Paper No 153. Evaluation and Policy Analysis Unit, UNHCR. 15 p, 2008).

149 Piguet (2008).

150 O. Brown, Migration and climate change (IOM Migration Research Series No.31. Geneva: International Organisation for Migration, 2008); Piguet (2008); N. Gleditsch, Climate Change and Conflict: The Migration Link (Coping With Crisis Working Paper: International peace Academy: New York, 2007); E. Meze-Hausken, Migration Caused by Climate Change: How Vulnerable are People in Dryland Areas? (Mitigation and Adaptation Strategies for Global Change 5/4, 379-406, 2000).

151 W.M. Adger and J. Barnett, Compensation for Climate Change Must Meet Needs (Nature 436/7049, 328, 2005); Mortreux, C. and J. Barnett, Climate Change, Migration and Adaptation in Funafuti, Tuvalu. Global Environmental Change, in press)

152 N. Myers, Environmental Refugees: A Growing Phenomenon of the 21st century (Philosophical Transactions of the Royal Society 357/1420, 609-613, 2002); Christian Aid, Human Tide: The Real Migration Crisis (Christian Aid: London, 2007); Brown (2008); S. Perch-Nielsen, et al. Exploring the Link Between Climate Change and Migration, Climatic Change, 2008); R. McLeman and B. Smit. Migration as an Human Adaptation to Climate Change (Climatic Change 76/1-2, 31-53, 2006); Meze-Hausken (2000).

153 G. Hugo, Environmental Concerns and International Migration (International Migration Review 30/1, 105-131, 1996); S. Castles, Environmental change and forced migration: Making sense of the debate," UNHCR Working Pa-

pers 70, 1-14, 2002); S. Lonergan, The Role of Environmental Degradation in Population Displacement (Environmental Change and Security Project Report No. 4, pp. 5-15, 1998).

154 Grothmann and Patt, (2005); J, Connell and R. King, Island Migration in a Changing World (In: King, R. and Connell, J. (Eds.) Small Worlds, Global Lives: Islands and Migration, Pinter Publications, London, pp. 1-26, 1990.

155 R. Bedford, et al. International Migration in New Zealand: Context, Components and Policy Issues (Population Studies Centre Discussion Papers (37), University of Waikato, 2000); C. Macpherson and L. Macpherson, The Changing Contours of Migrant Samoan Kinship (In: King, R. and Connell, J. (eds.), Small Worlds, Global Lives: Islands and Migration. Pinter Publications, London, pp. 277-296, 1990); A. Ravuvu, Security and Confidence as Basis Factors in Pacific Islanders' Migration (In: Spickard, P., Rondilla, J. and Wright, D. (Eds.), Pacific Diaspora: Island Peoples in the United States and Across the Pacific. University of Hawaii Press, Honolulu, pp. 87-98, 2002); R, Oderth, An Introduction to the Study of Human Migration: an Interdisciplinary Perspective (Writers Club Press, Lincoln, 2002).

156 Brown (2008).

157 R. Franke and B. Chasin. Seeds of Famine (New Jersey: Rowman and Allanheld, 1980).

158 K. Smith, Environmental Hazards: Assessing Risk and Reducing Disaster (Routledge, London, 1996).

159 S. Rahmstorf et al. Recent climate observations compared to projections (Science 316/5825, 709, 2007); S.D: Donner et al. (2005).

160 J. Barnett and W.N. Adger, Climate Dangers and Atoll Countries (Climatic Change 61, 321-337, 2003).

161 ACIA, Impacts of a warming Arctic (Arctic Climate Impact Assessment, Cambridge University Press, 2004); E.J. Keskitalo, Climate change and globalization in the Arctic: An integrated approach to vulnerability assessment (London, Earthscan 2008).

162 W.N. Adger, et al. (eds.) Adapting to Climate Change: Thresholds, Values, Governance (Cambridge: Cambridge University Press (in press)).

163 CSIS, The Age of Consequences: The Foreign Policy and National Security Implications of Global Climate Change (Washington D.C., CSIS, 2007); A. Dupont and G. Pearman, Heating Up the Planet: Climate Change and Security (Lowy Institute Paper 12. Double Bay, The Lowy Institute, 2006); C. Jasparro and J. Taylor, Climate Change and Regional Vulnerability to Transnational Security Threats in Southeast Asia (Geopolitics 13/2, 232-256, 2008); N. Myers, Environmental Refugees (Population and Environment 19/ 2, 167-182, 1997); P. Schwartz and D. Randall, An Abrupt Climate Change Scenario and its Implications for United States National Security (San Franciscio, Global Business Network, 2003). http://www.gbn.com/ArticleDisplayServlet.srv?aid=26231 Cited April 8 2007; German Advisory Council on Global Change (WGBU), World in Transition: Climate Change as a Security Risk (Summary for Policy Makers. Berlin, WBGU, 2007). http://www.wbgu.de/wbgu_jg2007_engl.html Cited November 29 2007.

164 J. Barnett, Security and Climate Change (Global Environmental Change Volume, Issue 1, pp. 7-17, 2003); J. Barnett and N. Adger, Climate Change, Human Security and Violent Conflict (Political Geography 26/6, 639-655, 2007); H. Buhaug, et al. Implications of climate change for armed conflict (Paper presented at the World Bank Workshop on the Social Dimensions of Climate Change, The World Bank, Washington, 5-6 March 2008); R. Nordås and N. Gleditsch, Climate conflict: common sense or nonsense? (Political Geography 26/ 6, 627-638, 2007); J. Scheffran, Climate Change and Security (Bulletin of the Atomic Scientists 64/2, pp. 19-25, pp. 59-60, 2008); I. Salehyan, From Climate Change to Conflict? No Consensus Yet (Journal of Peace Research 45/3, 315-326, 2008).

165 E. Miguel, et al. Economic Shocks and Civil Conflict: An Instrumental Variables Approach (Journal of Political Economy 112,4, 725-753, 2004).

166 C. Hendrix and S. Glaser, Trends and Triggers: Climate, Climate Change and Civil Conflict in Sub-Saharan Africa (Political Geography 26/6, 695-715, 2007); P. Meier, et al. Environmental Influence on Pastoral Conflict in the Horn of Africa (Political Geography 26/6, pp. 716-735, 2007).

167 E. Nel and M. Ringharts, Natural Disasters and the Risk of Violent Civil Conflict (International Studies Quarterly 52/1, 159-185, 2008).

168 H. Buhaug, et al. Implications of climate change for armed conflict (Paper presented at the World Bank Workshop on the Social Dimensions of Climate Change, The World Bank, Washington, 5-6 March 2008).

169 Buhaug, et al. (2008); J. Barnett and W.N. Adger, Climate change, human security and violent conflict (Political Geography 26/6, 639-655, 2007); C. Kahl, States, Scarcity, and Civil Strife in the Developing World (Princeton University Press: new Jersey, 2006).

170 G. Baechler, Violence Through Environmental Discrimination: Causes, Rwanda Arena and Conflict Model (Kluwer: Dordrecht, 1999). N, Gleditsch, et al, Climate Change and Conflict: The Migration Link. International Peace Academy Coping With Crisis (Working Paper: International peace Academy: New York, 2007). R, Reuveny, Climate Change Induced Migration and Violent Conflict (Political Geography 26/6, 656-673. 2007).

171 A. Carius, et al. Climate Change and Security: Challenges for German Development Cooperation (Deutsche Gesellschaft fur Technische Zusammenarbeit (GTZ) GmbH: Eschborn, 2008).

172 A.T. Wolf, A. Kramer, A. Carius and G.D. Dabelko. Navigating peace: Water can be a pathway to peace, not war. (Woodrow Wilson International Center for Scholars, July 2006)

173 Buhaug et al. (2008).

174 Sen (1999).

175 UNDP (2007/2008, p. 39).

176 IPCC (2007a).

177 IPCC, IPCC Workshop on Changes in Extreme Weather and Climate Events Beijing (Workshop Report, China, 11 – 13 June, 2002; R.E. Benestad and J.E. Haugen. On complex extremes: flood hazards and combined high springtime precipitation and temperature in Norway (Climate Change 85/3-4, 381-406, 2007).

178 UN General Assembly, International cooperation on humanitarian assistance in the field of natural disasters, from relief to development (Report of the Secretary-General. No. A/62/323. New York,2007); United Nations Economic and Social Council, 2008, (ECOSOC/6345, Background Release, 27 June 2008).

179 Schipper (2008).

180 O'Brien and Leichenko (2007).

181 O'Brien and Leichenko (2007).

Bibliography

This bibliography includes a selection of English-language literature that deals with themes relevant to the nexus between disaster risk reduction and climate change adaptation, with an emphasis on climate variability, extreme events and vulnerability. The literature is presented according to four categories: peer-reviewed articles; academic reports; books and book chapters; agency and NGO reports. Although the bibliography emphasizes recent literature, many important earlier contributions are also included.

Peer-reviewed articles

Adger, W.N. 1999. Social vulnerability to climate change and extremes in coastal Vietnam. *World Development*, Volume 27, pp. 249-69.

Adger, W.N. 2000. Institutional adaptation to environmental risk under the transition in Vietnam. *Annals of the Association of American Geographers*, Volume 90, Issue 4, pp. 738-758.

Adger, W.N. 2006. Vulnerability. *Global Environmental Change*, Volume 16, Issue 3, pp. 268-281.

Adger, W.N., and Kelly, M. 1999. Social vulnerability to climate change and the architecture of entitlements. *Mitigation and Adaptation Strategies for Global Change*, Volume 4, pp. 253-266.

Adger, W.N., P.M. Kelly, A. Winkels, L.Q. Huy, and C. Locke. 2002. Migration, remittances, livelihood trajectories, and social resilience. *AMBIO*, Volume 31, Issue 4, pp. 358-366.

Adger, W.N., T.P. Hughes, C. Folke, S.R Carpenter and J. Rockström. 2005. Social-ecological resilience to coastal disasters. *Science*, Volume 309, pp. 1036-1039.

Adger, W.N., N. W. Arnell, and E.L. Tompkins. 2005. Successful adaptation to climate change across scales. *Global Environmental Change Part A*, Volume 15, Issue 2, pp. 77-86.

Adger, W.N. and Barnett, J. 2005. Compensation for climate change must meet needs. *Nature*, Volume 436, Issue 7049, pp. 328.

Agrawala, S. and M. van Aalst. 2008. Adapting development cooperation to adapt to climate change. *Climate Policy*, Volume 8 (2), pp. 183-193.

Albala-Bertrand, J.M. 2000. Responses to complex humanitarian emergencies and natural disasters: An analytical comparison. *Third World Quarterly*, Volume 21, Issue 2, pp. 215-227.

Alberini, A., A. Chiabai, and L. Muehlenbachs 2006. Using expert judgment to assess adaptive capacity to climate change: Evidence from a conjoint choice survey. *Global Environmental Change*, Volume 16, Issue 2, pp. 123-144.

Alcamo, J., M. Floerke, and M. Maerker. 2007. Future long-term changes in global water resources driven by socio-economic and climatic changes. *Hydrological Sciences*, Volume 52, Issue 2, pp. 247-275.

Alessa, L., A. Kliskey, R. Busey, L. Hinzman and D. White. 2008. Freshwater vulnerabilities and resilience on the Seward Peninsula: Integrating multiple dimensions of landscape change. *Global Environmental Change*, Volume 18, pp. 256-270.

Allen, K.M. 2006. Community-based disaster preparedness and climate adaptation: local capacity-building in the Philippines. *Disasters*, Volume 30, Issue 1, pp. 81–101.

Alongi, D.M. 2008. Mangrove forests: Resilience, protection from tsunamis, and responses to global climate change. *Estuarine, Coastal and Shelf Science*, Volume 76, pp. 1-13.

Anthes, R.A., R.W. Corell, G. Holland, J.W. Hurrell, M.C. MacCracken and K.E. Trenberth. 2006. Hurricanes and global warming – potential linkages and consequences. *Bull. Am. Meteorol. Soc*., Volume 87, pp. 623-628.

Armitage, D., M. Marschke, and R. Plummer. 2008. Adaptive co-management and the paradox of learning. *Global Environmental Change*, Volume 18, pp. 86-98.

Arnell, N.W. 2004. Climate change and global water resources: SRES emissions and socio-economic scenarios. *Global Environmental Change*, Volume 14, pp. 31-52.

Arnell, N.W. and E.K. Delaney. 2006. Adapting to climate change: Public water supply in England and Wales. *Climatic Change*, Volume 78, Issue 2-4, pp. 227-255.

Auld, H. 2008. Disaster risk reduction under current and changing climate conditions. *WMO Bulletin*, Volume 57, Issue 2, pp. 118-125.

Bals, C., K. Warner, and S. Butzengeiger. 2006. Insuring the uninsurable: design options for a climate change funding mechanism. *Climate Policy*, Volume 6, Issue 6, pp. 637-647.

Bankoff, G. 2001. Rendering the world unsafe: Vulnerability as western discourse. *Disasters*, Volume 25, Issue 1, pp. 19-35.

Barnett, J. 2001. Adapting to climate change in Pacific Island Countries: The problem of uncertainty. *World Development*, Volume 29, Issue 6, pp. 977-993.

Barnett, J. 2003. Security and climate change. *Global Environmental Change*, Volume 13, Issue 1, pp. 7-17.

Barnett, J. 2007. Environmental security and peace. *Journal of Human Security*, Volume 3, Issue 1, pp. 4-16.

Barnett, J. 2008. The effect of aid on capacity to adapt to climate change: Insights from Niue. *Political Science* (forthcoming, June), special issue edited by Bronwyn Hayward.

Barnett, J. and W.N. Adger. 2003. Climate dangers and atoll countries. *Climatic Change*, Volume 61, pp. 321-337.

Barnett, T.P., D.W. Pierce, K.M. Achuta Rao, P.J. Gleckler, B.D. Santer, J.M. Gregory, W.M. Washington. 2005. Penetration of human-induced warming into the world's oceans. *Science*, Volume 309, pp. 284-287.

Barnett J. and W.N. Adger. 2007. Climate change, human security and violent conflict. *Political Geography*, Volume 26, Issue 6, pp. 639-655.

Barnett, J., S. Dessai and R. Jones. 2007. Vulnerability to climate variability and change in East Timor. *AMBIO*, Volume 36, Issue 5, pp. 372-378.

Beg, N., J. Corfee Morlot, O. Davidson, Y. Afrane-Okesse, L. Tyani, F. Denton, Y. Sokona, J.P. Thomas, E.L. La Rovere, J.K. Parikh, K. Parikh and A.A. Rahman. 2002. Linkages between climate change and sustainable development. *Climate Policy*, Volume 2, Issue 2-3, pp. 129-144.

Belliveau, S., B. Smith and B. Bradshaw. 2006. Multiple exposures and dynamic vulnerability: Evidence from the grape industry in the Okanagan Valley, Canada. *Global Environmental Change*, Volume 16, pp. 364-378.

Below, R, E. Grover-Kopec and M. Dilley. 2007. Drought related disasters: A global assessment. *Journal of Environment and Development*, Volume 16, pp. 328-344.

Benestad, R.E. and J.E. Haugen. 2007. On complex extremes: flood hazards and combined high spring-time precipitation and temperature in Norway. *Climate Change*, Volume 85, Issue 3-4, pp. 381-406.

Beniston, M. 2007. Linking extreme climate events and economic impacts: Examples from the Swiss Alps. *Energy Policy* Volume 35, pp. 5384–5392.

Berkhout, F. 2005. Rationales for adaptation in EU climate change policies. *Climate Change*, Volume 5, Issue 3, pp. 377-391.

Berkhout, F., J. Hertin, and D.M. Gann. 2006. Learning to adapt: Organizational adaptation to climate change impacts. *Climatic Change*, Volume 78, Issue 1, pp. 135-156.

Blanco, A.R. 2006. Local initiatives and adaptation to climate change, *Disasters*, Volume 30, Issue 1, pp. 141–147.

Bohle, H., T. Downing and M. Watts. 1994. Climate change and social vulnerability: Toward a sociology and geography of food insecurity. *Global Environmental Change*, Volume 4, pp. 37-48.

Bouwer, L.M and J.C Aerts. 2006. Financing climate change adaptation. *Disasters*, Volume 30, Issue 1, pp.49-63.

Bouwer, L.M., R.P. Crompton, E. Faust, P. Hoppe and R.A. Pielke. 2007. Confronting disaster losses. *Science*, Volume 318, Issue 11, p. 753.

Brewer, T.L. 2003. The trade regime and the climate regime: Institutional evolution and adaptation. *Climate Policy*, Volume 3, Issue 4, pp. 329-341.

Brooks, N., W.N. Adger, and P.N. Kelly. 2005. The determinants of vulnerability and adaptive capacity at the national level and the implications for adaptation. *Global Environmental Change Part A*, Volume 15, Issue 2, pp. 151-163.

Brouwer, R., S. Akter, L. Brander and E. Haque. 2007. Socioeconomic vulnerability and adaptation to environmental risk: A case study of climate change and flooding in Bangladesh. *Risk Analysis*, Volume 27, Issue 2, pp. 313-326.

Brown, O., A Hammill, and R. McLeman. 2007. Climate change: The new security threat. *International Affairs*, Volume 83, Issue 6, pp. 1141-1154.

Bruce, J.P. 1999. Disaster loss mitigation as an adaptation to climate variability and change. *Mitigation and Adaptation Strategies for Global Change*, Volume 4, Issue 3-4, pp. 295-306.

Bryant, C., B. Smit, M. Brklacich, T. Johnston, J. Smithers, Q, Chjotti and B. Singh. 2000. Adaptation in canadian agriculture to climatic variability and change. *Climatic Change*, Volume 45, Issue 1, pp. 181-201.

Bunyavanich, S., C.P. Landrigan, A.J. McMichael and P.R. Epstein. 2003. The impact of climate change on child health. *Ambulatory Pediatrics*, Volume 3, pp. 44-52.

Burch, S. and J. Robinson. 2007. A framework for explaining the links between capacity and action in response to global climate change. *Climate Policy*, Volume 7, Issue 4, pp. 304-316.

Burton, I. 1997: Vulnerability and adaptive response in the context of climate and climate change. *Climatic Change*, Volume 36, pp.185-196.

Burton, I., S. Huq, B. Lim, O. Pilifosova, and E.L. Schipper. 2002. From impacts assessment to adaptation priorities: The shaping of adaptation policy. *Climate Policy*, Volume 2, pp. 145–159.

Burton, I., L. Bizikova, T. Dickinson, and Y. Howard. 2007. Integrating adaptation into policy: Upscaling evidence from local to global. *Climate Policy*, Volume 7, Issue 4, pp. 371-376.

Butt, T.A., B.A. McCarl, and A.O. Kergna. 2006. Policies for reducing agricultural sector vulnerability to climate change in Mali. *Climate Policy*, Volume 5, Issue 6, pp. 583-598.

Byravan, S. and S.C. Rajan. 2006. Providing new homes for climate change exiles. *Climate Policy*, Volume 6, Issue 2, pp. 247-252.

Cannon, T. 2002. Gender and climate hazards in Bangladesh. *Gender and Development*, Volume 10, Issue 2, pp. 45-51.

Challinor, A., T. Wheeler, C. Garforth, P. Craufurd, and A. Kassam. 2007. Assessing the vulnerability of food crop systems in Africa to climate change. *Climatic Change*, Volume 83, Issue 3, pp. 381-399.

Chambers, R. 2006. Editorial introduction: vulnerability, coping and policy. *IDS Bulletin*, Volume 37, Issue 4, pp. 33–40.

Changnon, S. 2003. Present and future economic impacts of climate extremes in the United States. *Environmental Hazards*, Volume 5, pp. 47-50.

Chapin, F.S., III, G. Peterson, F. Berkes, T.V. Callaghan, P. Angelstam, M. Apps, C. Beier, Y. Bergeron, A.-S. Crépin, K. Danell, T. Elmqvist, C. Folke, B. Forbes, N. Fresco, G. Juday, J. Niemelä, A. Shvidenko, and G. Whiteman. 2004. Re-

silience and vulnerability of northern regions to social and environmental change. *AMBIO*, Volume 33, Issue 6, pp. 344-349.

Chapin, F.S., M. Hoel, S.R. Carpenter, J. Lubchenco, B. Walker, T.V. Callaghan, C. Folke, S.A. Levin, K.-G. Mäler, C. Nilsson, S. Barrett, F. Berkes, A.-S. Crépin, K. Danell, T. Rosswall, D. Starrett, A. Xepapadeas, and S.A. Zimov. 2006. Building resilience and adaptation to manage Arctic change. *AMBIO*, Volume 35, Issue 4, pp. 198-202.

Chatterjee, K., A. Chatterjee and S. Das. 2005. Case study 2: India community adaptation to drought in Rajasthan. *IDS Bulletin-Institute of Development Studies*, Volume 36, Issue 4, pp. 33.

Cutter, S.L., B. Boruff, and W.L. Shirley. 2003. Social vulnerability to environmental hazards. *Social Sciences Quarterly*, Volume 84, Issue 2, pp. 242-261.

Cutter, S.L. and C. Finch. 2008. Temporal and spatial changes in social vulnerability to natural hazards. *PNAS*, Volume 105, pp. 2301-2306.

Dahal, N. 2005. Perceptions in the Himalayas. *Tiempo*, Volume 56, pp. 19–24.

Dang, H.H., A. Michaelowa, and D.D. Thuan. 2003. Synergy of adaptation and mitigation strategies in the context of sustainable development: the case of Vietnam. *Climate Policy*, Volume 3 (Supplement: Suppl. 1), pp. S81-S96.

Dasgupta, S. and K. Hamilton. 2006. Environment during growth: Accounting for governance and vulnerability. *World Development*, Volume 34, Issue 9, pp. 1597-1611.

Davidson, O., K. Halsnæs, S. Huq, M. Kok, B. Metz, Y. Sokona and J. Verhagen. 2003. The development and climate nexus: the case of sub-Saharan Africa. *Climate Policy*, Volume 3 (Supplement: Suppl. 1), pp. S97-S113.

de Janvry, A., E. Sadoulet, P. Solomon and R.V. Vakis. 2006. Can conditional cash transfer programs serve as safety nets in keeping children at school and from working when exposed to shocks? *Journal of Development Economics*, Volume 79, pp. 349– 373.

Denton, F. 2002. Climate change vulnerability, impacts, and adaptation: why does gender matter? *Gender and Development*, Volume 10, Issue 2, pp. 10-21.

Dessai, S. 2003. The special climate change fund: origins and prioritization assessment. *Climate Policy*, Volume 3, Issue 3, pp. 295-302.

Dessai, S. and M. Hulme. 2004. Does climate adaptation policy need probabilities? *Climate Policy*, Volume 4, Issue 2, pp. 107-128.

Dessai, S., X. Lu, J.S. Risbey. 2005. On the role of climate scenarios for adaptation planning. *Global Environmental Change Part A*, Volume 15, Issue 2, pp. 87-97.

Dolan, A.H. and I.J. Walker. 2004. Understanding vulnerability of coastal communities to climate change related risks. *Journal of Coastal Research*, Volume 39.

Doniger, D.D., A.V. Herzog and D.A. Lashof. 2006. Climate change: An ambitious, centrist approach to global warming legislation. *Science*, Volume 314, pp. 764.

Donner, S.D, W. J. Skirving, C. M. Little, O. Hoegh-Guldberg, and M. Oppenheimer. 2005. Global assessment of coral bleaching and required rates of adaptation under climate change. *Global Change Biology*, Volume 11, Issue 12, pp. 2251-2265.

Douglas, I., K. Aam, M. Maghenda, Y. McDonnell, L. McLean and J. Campbell. 2008. Unjust waters: climate change, flooding and the urban poor in Africa. *Environment and Urbanization*, Volume 20, pp. 187-205.

Dow, K., R.E. O'Connor, B. Yarnal, G.J. Carbone, and C.L. Jocoy. 2007. Why worry? Community water system managers' perceptions of climate vulnerability. *Global Environmental Change*, Volume 17, Issue 2, pp. 228-237.

Eakin, H. 2000: Smallholder maize production and climatic risk: a case study from Mexico. *Climatic Change*, Volume 45, pp. 19-36.

Eakin, H. 2005. Institutional change, climate risk, and rural vulnerability: Cases from central Mexico. *World Development*, Volume 33, Issue 11, pp. 1923-1938.

Eakin, H. and M.C. Lemos. 2006. Adaptation and the state: Latin America and the challenge of capacity-building under globalization. *Global Environmental Change*, Volume 16, Issue 1, pp. 7-18.

Eakin, H. and A. Luers. 2006. Assessing the vulnerability of social-ecological systems. *Annual Review of Environment and Resources*, Volume 31, pp. 365-394.

Eakin, H. and L.A. Bojórquez-Tapia. 2008. Insights into the composition of household vulnerability from multicriteria decision analysis. *Global Environmental Change*, Volume 18, Issue 1, pp. 112-127.

Emanuel, K. 2005. Increasing destructiveness of tropical cyclones over the past 30 years. *Nature*, Volume 436, pp. 686-688.

Emanuel, K., R. Sundararajan and J. Williams, J., 2008. Hurricanes and global warming. results from downscaling IPCC AR4 simulations. *Bull. American Meteorological Society*, Volume 89, Issue 3, pp. 347-367.

Enders, J. 2001. Measuring community awareness and preparedness for emergencies. *The Australian Journal of Emergency Management*, Volume 16, Issue 3.

Endfield, G.H. and I.F.Tejedo. 2006. Decades of drought, years of hunger: Archival investigations of multiple year droughts in late colonial Chihuahua. *Climatic Change*, Volume 75, Issue 4, pp. 391-419.

Eriksen, S.H. and K. O'Brien. 2007. Vulnerability, poverty and the need for sustainable adaptation measures. *Climate Policy*, Volume 7, Issue 4, pp. 337-352.

Eriksen, S. and P.M., Kelly. 2007. Developing credible vulnerability indicators for climate adaptation policy assessment. *Mitigation and Adaptation Strategies for Global Change*, Volume 12, pp. 495–524.

Fernandez L.S., D. Byard, C.-C. Lin, S. Benson and J.A. Barbera, 2002. Frail elderly as disaster victims: emergency management strategies. *Prehospital and disaster medicine*, Volume 17, Issue 2, pp. 67–74.

Few, R. 2003. Flooding, vulnerability and coping strategies: local responses to a global threat. *Progress in Development Studies*, Volume 3, Issue 1, pp. 43-58.

Few, R., K. Brown, and E.L. Tompkins. 2007. Public participation and climate change adaptation: Avoiding the illusion of inclusion. *Climate Policy*, Volume 7, Issue 1, pp. 46-59.

Few, R. 2007. Health and climatic hazards: Framing social research on vulnerability, response and adaptation. *Global Environmental Change*, Volume 17, Issue 2, pp. 281-29.

Fischer, G., M. Shah, N. Tubiello and H. van Velthuizen. 2005. Socio-economic and climate change impacts on agriculture: An integrated assessment, 1990–2000. *Philosophical Transactions of the Royal Society*, Volume 360, pp. 2067–2083.

Flynn, D. 2007. The impact of disasters on small business disaster planning: A case study. *Disasters*, Volume 31, pp. 508-15.

Folke, C., S. Carpenter, T. Elmqvist, L. Gunderson, C.S. Holling, and B. Walker. 2002. Resilience and sustainable development: Building adaptive capacity in a world of transformations. *AMBIO,* Volume 31, Issue 5, pp. 437-440.

Folke, C. 2006. Resilience: The emergence of a perspective for social–ecological systems analyses. *Global Environmental Change*, Volume 16, Issue 3, pp. 253-267.

Forbes, B.C., N. Fresco, A. Shvidenko, K. Danell, and F.S. Chapin, III. 2004. Geographic variations in anthropogenic drivers that influence the vulnerability and resilience of social-ecological systems. *AMBIO*, Volume 33, Issue 6, pp. 377-382.

Ford, J.D., B. Smit and J. Wandel. 2006. Vulnerability to climate change in the Arctic: A case study from Arctic Bay, Canada. *Global Environmental Change*, Volume 16, Issue 2, pp. 145-160.

Fraser, E.D.G. 2007. Travelling in antique lands: Using past famines to develop an adaptability/resilience framework to identify food systems vulnerable to climate change. *Climatic Change*, Volume 83, Issue 4, pp. 495-514.

Freebairn, J. 2007. Economic issues with climate change. *The Australian Economic Review*, Volume 40, pp. 402-409.

Füssel, H.M. 2007. Vulnerability: A generally applicable conceptual framework for climate change research. *Global Environmental Change*, Volume 17, Issue 2, pp. 155-167.

Füssel, H.M. and R.J.T. Klein. 2006. Climate change vulnerability assessments: An evolution of conceptual thinking. *Climatic Change*, Volume 75, Issue 3, pp. 301-329.

Gagnon-Lebrun, F. and S. Agrawala. 2007. Implementing adaptation in developed countries: an analysis of progress and trends. *Climate Policy*, Volume 7, Issue 5, pp. 392-408.

Gaillard, J.C., M.R.M. Pangilinan, J.R. Cadag, and V. Le Masson. 2008. Living with increasing floods: insights from a rural Philippine community. *Disaster Prevention and Management*, Volume 17, Issue 3, pp. 383-395.

Galaz, V. 2005. Social-ecological resilience and social conflict: Institutions and strategic adaptation in Swedish water management. *AMBIO*, Volume 34, (7), pp. 567-572.

Gallopín, G.C. 2006. Linkages between vulnerability, resilience, and adaptive capacity. *Global Environmental Change*, Volume 16, Issue 3, pp. 293-303.

Gardemann, J. 2002. Primary health care in complex humanitarian emergencies: Rwanda and Kosovo experiences and their implications for public health training. *Croatian Medical Journal*, Volume 43, Issue 2, pp. 148-155.

Garenne, M. and A.E. Gakusi. 2006. Vulnerability and resilience: Determinants of under-five mortality changes in Zambia. *World Development*, Volume 34, Issue 10, pp. 1765-1787.

Getachew, D. 2007. Reversing food insecurity: Linking global commitments to local recovery needs. *Journal of humanitarian assistance*, October 28 2007.

Godschalk, D.R. 2003. Urban hazard mitigation: Creating resilient cities. *Natural Hazards Review*, Volume 4, pp. 136–143.

Gordon, L. J., G.D. Peterson and E.M. Bennett. 2008. Agricultural modifications of hydrological flows create ecological surprises. *Trends in Ecology & Evolution*, Volume 23, pp. 211-219.

Groisman, P.Y., R.W. Knight, D.R. Easterling, T.R. Karl, G.C. Hegerl and V.N. Razuvaev. 2005. Trends in intense precipitation in the climate record. *Journal of Climate*, Volume 18, pp. 1326-1350.

Grothmann, T. and A. Patt. 2005. Adaptive capacity and human cognition: the process of individual adaptation to climate change. *Global Environmental Change Part A*, Volume 15, Issue 3, pp. 199-213.

Haddad, B.M. 2005. Ranking the adaptive capacity of nations to climate change when socio-political goals are explicit. *Global Environmental Change Part A*, Volume 15, Issue 2, pp. 165-176.

Hallegatte, S., J. Hourcade and P. Dumas. 2007. Why economic dynamics matter in assessing climate change damages: Illustration on extreme events. *Ecological Economics*, Volume 62, pp. 330 – 340.

Hallegatte, S., J.-C. Hourcade, and P. Ambrosi. 2007. Using climate analogues for assessing climate change economic impacts in urban areas. *Climatic Change*, Volume 82, pp. 47-60.

Halsnæs, K., P. Shukla, and A. Garg. 2008. Sustainable development and climate change: lessons from country studies. *Climate Policy*, Volume 8, Issue 2, pp. 202-219.

Handmer, J., S. Dovers and T. Downing. 1999. Societal vulnerability to climate change and variability. *Mitigation and Adaptation Strategies for Global Change*, Volume 4, Issue 3-4, pp. 267-281.

Haque, C.E and I. Burton. 2005. Adaptation options strategies for hazards and vulnerability mitigations: and international perspective. *Mitigation and Adaptation Strategies for Global Change,* Volume 10, pp. 335-353.

Harlan, S.L., A.J. Brazel, L. Prashad, W.L. Stefanov and L. Larsen. 2006. Neighborhood microclimates and vulnerability to heat stress. *Social Science and Med.icine*, Volume 63, Issue 11, pp. 2847-63.

Hay, J.E., N. Mimura, J. Campbell, S. Fifita, K. Koshy, R.F. McClean, S. Huq, F. Yamin, A. Rahman, A. Chatterjee, X. Yang, S. Wade, V. Orindi and J. Chigwada. 2005. Linking climate adaptation and development: A synthesis of six case studies from Asia and Africa. *IDS Bulletin*, Volume 36, Issue 4, pp.117.

Hedger, M.M., R. Connell, and P. Bramwell. 2006. Bridging the gap: empowering decision-making for adaptation through the UK Climate Impacts Programme. *Climate Policy*, Volume 6, Issue 2, pp. 201-215.

Helmer, M. and D. Hilhorst. 2006. Natural disasters and climate change. *Disasters*, Volume 30, Issue 1, pp. 1-4.

Hendrix, C. and S. Glaser. 2007. Trends and triggers: Climate, climate change and civil conflict in sub-Saharan Africa. *Political Geography*, Volume 26, Issue 6, pp. 695-715.

Hilhorst, T. 2003. Responding to disasters: diversity of bureaucrats, technocrats and local people. *International Journal of Mass Emergencies and Disasters*, Volume 21, Issue 3, pp. 37-55.

Hilhorst, T. 2005. Dead letter or living documents? Ten years code of conduct for disaster relief. *Disasters*, Volume 29, Issue 4, pp. 351-369.

Hoeppe, P. and E.N. Gurenko. 2006. Scientific and economic rationales for innovative climate insurance solutions. *Climate Policy*, Volume 6, Issue 6, pp. 607-620.

Hofman, D. 2007. Time to master disaster. *Finance and Development*, Volume 44, Issue 1.

Hoyos, C. D., P.A. Agudelo, P.J. Webster and J.A.Curry. 2006. Deconvolution of the factors contributing to the increase in global hurricane intensity. *Science*, Volume 312, pp. 94-97.

Hugo, G. 1996. Environmental concerns and international migration. *International Migration Review*, Volume 30, Issue 1, pp. 105-131.

Huigen, M.G.A and I.C. Jens. 2006. Socio-economic impact of super typhoon Harurot in San Mariano, Isabela, the Philippines. *World Development*, Volume 34, Issue 12, pp. 2116-2136.

Hulme, M. and B. Metz. 2005. Climate policy options post-2012 – European strategy, technology and adaptation after Kyoto – Preface. *Climate Policy*, Volume 5, Issue 3, pp. 243-243.

Huppert, H.E. and R.S.J. Sparks. 2006. Extreme natural hazards: Population growth, globalization and environmental change. *Phil. Trans. R. Soc*. A, Volume 364, pp. 1875–1888.

Huq, S. and H. Reid. 2003. The role of people's assessments, *Tiempo* 48 , pp. 5–9.

Huq, S., A. Rahman, M. Konate, Y. Sokona and H. Reid. 2004. Mainstreaming adaptation to climate change in Least Developed Countries (LDCs). *Climate Policy*, Volume 4, Issue 1, pp. 25-43.

Huq, S., F. Yamin, A. Rahman, A. Chatterjee, X. Yang, S. Wade, V. Orindi and J Chigwada. 2005. Linking climate adaptation and development: A synthesis of six case studies from Asia and Africa. *IDS Bulletin*, Volume 36, Issue 4, pp. 117.

Huq, S., Kovats, S., Reid, H., and D. Satterthwaite. 2007. Reducing risks to cities from disasters and climate change. *Environment and Urbanization*, Volume 19, Issue 1, pp. 39-64.

Janssen, M.A. and E. Ostrom. 2006. Resilience, vulnerability, and adaptation: A cross-cutting theme of the International Human Dimensions Programme on Global Environmental Change *Global Environmental Change*, Volume 16, pp. 237-239.

Janssen, M.A., M.L. Schoon, W. Ke, and K. Börner. 2006. Scholarly networks on resilience, vulnerability and adaptation within the human dimensions of global environmental change. *Global Environmental Change*, Volume 16, Issue 3, pp. 237-239.

Jasparro, C. and J. Taylor. 2008. Climate change and regional vulnerability to transnational security threats in Southeast Asia. *Geopolitics*, Volume 13, Issue 2, pp. 232-256.

Jerneck, A. and L. Olsson. 2008. Adaptation and the poor: development, resilience and transition. *Climate Policy*, Volume 8, Issue 2, pp. 170-182.

Jones, R. A. 2004. Incorporating agency into climate change risk assessment. *Climatic Change*, Volume 67, pp. 13-36.

Kasakula, M. 2005. Impacts on small-scale farmers. *Tiempo*, Volume 57, pp. 9–10.

Kates, R.W. 2000. Cautionary tales: adaptation and the global poor. *Climatic Change*, Volume 45 (1), pp. 5-17.

Kar, N., P.K . Mohapatra, K.C. Nayak, P. Pattanaik, S.P. Swain and H.C. Kar. 2007. Post-traumatic Stress Disorder in Children and Adolescents One Year After a Super-Cyclone in Orissa, India: Exploring Cross-Cultural Validity and Vulnerability Factors. *BMC Psychiatry* Volume 14, 7:8.

Keatinge, W.R. and G.C Donaldson. 2004. The impact of global warming on health and mortality. *South Medical Journal*, Volume 11, pp. 1093-99.

Kelkar, U., C.R. James, and R. Kumar. 2006. The Indian insurance industry and climate change: exposure, opportunities and strategies ahead. *Climate Policy*, Volume 6, Issue 6, pp. 658-671.

Kelly, P. M. and W.N. Adger. 2000. Theory and practice in assessing vulnerability to climate change and facilitating adaptation. *Climatic Change* 47, Issue 4, pp. 325-352.

Kerr, R. A., 2008. Hurricanes won't go wild, according to climate models. *Science*, Volume 320, pp. 999.

Keskitalo, E.C.H. 2008. Vulnerability and adaptive capacity in forestry in northern Europe: a Swedish case study. *Climatic Change*, Volume 87, Issue 1-2, pp. 219-234.

Khady, D. 2007. Governance and natural disasters: addressing flooding in Saint Louis, Senegal. *Environment and Urbanization*, Volume 19, Issue 2, pp. 552-562.

Khagram, S., W. Clark, and D. Riras Raad. 2003. From the environment and human security to sustainable security and development. Journal of Human Development, Volume 4, Number 2, pp. 289-313.

Kirschke, J. and W. van Vliet. 2005. How can they look so happy? Reconstructing the place of children after Hurricane Katrina: images and reflections. *Children, Youth and Environments*, Volume 15, Issue 2, pp. 378-391.

Klein, R.J.T., S.E.H. Eriksen, L.O. Næss, A. Hammill, C. Robledo, K.L. O'Brien and T.M. Tanner. 2007. Portfolio screening to support the mainstreaming of adaptation to climate change into development assistance. *Climatic Change*, Volume 84, Issue 1, pp. 23-44.

Knutson, T. R., J.J., Sirutis, S.T., Garner, G.A., Vecchi, and I.M., Held. 2008. Simulated reduction in Atlantic hurricane frequency under twenty-first-century warming conditions. *Nature Geoscience*, Volume 1, Issue 6, pp. 359-364.

Kok, M. B. Metz, J. Verhagen, and S. van Roijen. 2008. Integrating development and climate policies: National and international benefits. *Climate Policy*, Volume 8, Issue 2, pp. 103-118.

Kopk, M.T.J. and H.C. de Coninck. 2007. Widening the scope of policies to address climate change: Directions for mainstreaming. *Environmental Science & Policy*, pp. 587-599.

Kovats, R. and K. Ebi. 2006. Heatwaves and public health in Europe. *The European Journal of Public Health*, Volume 16, Issue 6, pp. 592-599.

Kovats, R. and R. Akhtar, 2008. Climate, climate change and human health in Asian Cities. *Environment and Urbanization*, Volume 20, No. 1, pp. 165-175.

Kraas, F. 2003. Megacities as global risk areas. *Petermanns Geographische Mitteilungen*, Volume 147, pp. 6–15.

Kundzewicz, Z. W., M. Radziejewski and I. Pinskwar. 2006. Precipitation extremes in the changing climate of Europe. *Climate Research*, Volume 31, pp. 51–58.

Lam, L.T. 2007. The association between climatic factors and childhood illness presented to hospital emergency among young children. *International Journal of Environmental Health Research*, Volume 17, Issue 1, pp. 1-8.

Landman, W.A. and S.J., Mason. 1999: Change in the association between Indian Ocean sea-surface temperatures and rainfall over South Africa and Namibia, *International Journal Climatology*, Volume 19, pp. 1477-1492.

Landsea, C. W. 2005. Hurricanes and global warming. *Nature* 438, E11-E12.

Larsen, P.H., S. Goldsmith, O. Smith, M. Wilson, K. Strzepek, P. Chinowsky, and B. Saylor. 2008. Estimating future costs for Alaska public infrastructure at risk from climate change. *Global Environmental Change*, In Press, Corrected Proof, Available online 3 June 2008.

Lasage, R., S. Mutiso, G.C.M. Mutiso, E.O. Odada, J. Aerts, and A.C. de Vries. 2006. Adaptation to droughts: developing community based sand dams in Kitui, Kenya. *Geophysical Research Abstracts*, Volume 8, pp. 01596.

Leichenko, R. and K.L. O'Brien. 2002. The dynamics of rural vulnerability to global change: The case of southern Africa. *Mitigation and Adaptation Strategies for Global Change*, Volume 7, Issue 1, pp. 1-18.

Leichenko, R. and W. Solecki. 2008. Consumption, inequity, and environmental justice: The making of new metropolitan landscapes in developing countries. *Society and Natural Resources*, Volume 21, pp. 611-624.

Lie, J. 2007. Global climate change and the politics of disaster. *Sustainable Science*, Volume 2, pp. 233-236.

Linnerooth-Bayer, J. and R. Mechler. 2006. Insurance for assisting adaptation to climate change in developing countries: a proposed strategy. *Climate Policy*, Volume 6, Issue 6, pp. 621-636.

Liu, J.G. T. Dietz, S. R. Carpenter, C. Folke, M. Alberti, C. L. Redman, S. H. Schneider, E. Ostrom, A.N. Pell, J. Lubchenco, W.W. Taylor, Z. Ouyang, P. Deadman, T. Kratz, and W. Provencher. 2007. Coupled human and natural systems. *AMBIO*, Volume 36, Issue 8, pp. 639-649.

Liverman, D.M. 1999. Vulnerability and adaptation to drought in Mexico. *Natural Resources Journal*, Volume *39*, Issue 1, pp. 99-115.

Liverman, D. 2008. Assessing impacts, adaptation and vulnerability: Reflections on the Working Group II Report of the Intergovernmental Panel on Climate Change. *Global Environmental Change*, Volume 18, Issue 1, pp. 4-7.

Mallick, D.L., A. Rahman, M. Alam, A.S. Md Juel, A.N. Ahmad and S.S. Alam. 2005. Floods in Bangladesh: A shift from disaster management towards disaster preparedness. *IDS Bulletin*, Volume 36, Issue 4, pp. 53–70.

Manuel-Navarrete, D., J.J. Gómez and G. Gallopin. 2007. Syndromes of sustainability of development for assessing the vulnerability of coupled human-environmental systems. The case of hydrometeorological disasters in Central America and the Caribbean. *Global Environmental Change*, Volume 17, pp. 207-217.

Marangos, J. and C. Williams. 2005. The effect of drought on uncertainty and agricultural investment in Australia. *Journal of Post Keynesian Economics*, Volume 27, pp. 575-594.

Marechal, K. 2007. The economics of climate change and the change of climate in economics. *Energy Policy*, Volume 35, pp. 5181–5194.

Marx, S., E. Weber, B. Orlove, A. Leiserowitz, D. Krantz, C. Roncoli and J. Philips. 2006. Communication and mental processes: experiential and analytic processing of uncertain climate information. *Global Environmental Change*, Volume 17, pp. 47-58.

McDaniels, T. Chang, S., Cole, D., Mikawoz, J., and Longstaff, H. 2008. Fostering resilience to extreme events within infrastructure systems: Characterizing decision contexts for mitigation and adaptation. *Global Environmental Change*, Volume 18, pp. 310-318.

McGranahan, G. D. Balk and B. Anderson. 2007. The rising tide: assessing the risks of climate change and human settlements in low-elevation coastal zones. *Environment and Urbanization*, Volume 19, pp. 17-37.

McLaughlin, P. and T. Dietz. 2008. Structure, agency and environment: Toward an integrated perspective on vulnerability. *Global Environmental Change*, Volume 18, Issue 1, pp. 99-111.

McLeman, R. and B. Smit. 2006. Migration as an adaptation to climate change. *Climatic Change*, Volume 76, Issue 1-2, pp. 31-53.

Meier, P., D. Bond and J. Bond. 2007. Environmental Influence on Pastoral Conflict in the Horn of Africa. *Political Geography*, Volume 26, Issue 6, pp. 716-735.

Meze-Hausken, E. 2000. Migration caused by climate change: How vulnerable are people in dryland areas? *Mitigation and Adaptation Strategies for Global Change*, Volume 5, Issue 4, pp. 379-406.

Michaelowa, A. 2006. Can insurance deal with negative effects arising from climate policy measures? *Climate Policy*, Volume 6, pp. 672-682.

Miguel, E., S. Satyanath and E. Sergenti. 2004. Economic shocks and civil conflict: an instrumental variables approach. *Journal of Political Economy*, Volume 112, Issue 4, pp. 725-753.

Mileti, D. and J.L Galius. 2005. Sustainable development and hazards mitigation in the United States: Disasters by design revisited. *Mitigation and Adaptation Strategies for Global Change*, Volume 10, Issue 3, pp. 491–504.

Mills, E. 2005. Insurance in a Climate of Change. *Science*, Volume 309, pp. 1040–1044.

Milly, P.C.D. K.A. Dunne and A.V. Vecchia. 2005. Global pattern of trends in streamflow and water availability in a changing climate. *Nature*, Volume 438, pp. 347-350.

Milly, P., J. Betancourt, M. Falkenmark, R. Hirsch, Z. Kundzewicz, D. Lettenmaier and R. Stouffer, 2008. Stationarity is dead: Whither water management? *Science*, Volume 319 (5863), pp. 573 – 574.

Mirza, M.M.Q. 2003. Climate change and extreme weather events: can developing countries adapt? *Climate Policy*, Volume 3, Issue 3, pp. 233-248.

Mirza, M. M. Q., R.A. Warrick, and N.J. Ericksen 2003. The implications of climate

change on floods of the Ganges, Brahmaputra and Meghna Rrivers in Bangladesh.

Climatic Change, Volume 57, pp. 287-318.

Morf, A. 2005. Public participation in municipal planning as a tool for coastal management: Case studies from western Sweden. *AMBIO*, Volume 34, Issue 2, pp. 74-83.

Moritz, M.A. and S.L. Stephens. 2008. Fire and sustainability: considerations for California's altered future climate. *Climatic Change*, Volume 87 (Supplement: Suppl. 1), pp. S265-S271.

Morlot, J.C., J. Smith, S. Agrawala, and T. Franck. 2005. Long-term goals and post-2012 commitments: Where do we go from here with climate policy? *Climate Policy*, Volume 5, Issue 3, pp. 251-272.

Mortimore, M.J. & W.M. Adams, W.M. 2001. Farmer adaptation, change and 'crisis' in the Sahel. *Global Environmental Change*, Volume 11, Issue 1, pp. 49-57.

Morton, J.F. 2007. Climate change and food security special feature: The impact of climate change on smallholder and subsistence agriculture. *Proceedings of the National Academy of Sciences*, Volume 104, pp. 19680-19685.

Mortreux, C. and J. Barnett. In press. Climate change, migration and adaptation in Funafuti, Tuvalu. *Global Environmental Change*, in press.

Moser, S.C. 2005. Impact assessments and policy responses to sea-level rise in three US states: An exploration of human-dimension uncertainties. *Global Environmental Change*, Volume 15, pp. 353-369.

Moser, S.C and A.L. Luers. 2008. Managing climate risks in California: The need to engage resource managers for successful adaptation to change. *Climatic Change*, Volume 87, pp. S309-S322.

Myers, N. 1997. Environmental refugees. *Population and Environment*, Volume 19, Issue 2, pp. 167-182.

Myers, N. 2002. Environmental refugees: a growing phenomenon of the 21st century. *Philosophical Transactions of the Royal Society*, Volume 357, Issue 1420, pp. 609-613.

Narayan, P. 2003. Macroeconomic impact of natural disasters on a small island economy: Evidence from a CGE model. *Applied Economics Letters,* Volume 10, pp. 721-723.

Nchinda, T. 1998. Malaria: A reemerging disease in Africa. *Emerging Infectious Diseases*, Volume 4, Issue 3, pp. 398-403.

Nel, E. and M. Ringharts. 2008. Natural disasters and the risk of violent civil conflict. *International Studies Quarterly*, Volume 52, Issue 1, pp. 159-185.

Nelson, D., W. Adger and K. Brown. 2007. Adaptation to environmental change: Contributions of a resilience framework. *Annual Review of Environment and Resources*, Volume 32, pp. 395-419.

Nelson, V., K. Meadows, T. Cannon, J. Morton, and A. Martin. 2002. Uncertain predictions, invisible impacts, and the need to mainstream gender in climate change adaptation. *Gender and Development* 10: 51–59.

Nishikiori, N., T. Abe, D.G.M. Costa, S.D. Dharmaratne, O. Kunii and K. Moji. 2006. Who died as a result of the tsunami? – Risk factors of mortality among internally displaced persons in Sri Lanka: a retrospective cohort analysis. *BMC Public Health*, Volume 6, pp. 7.

Nordås, R. and N.P. Gleditsch. 2007. Climate change and conflict. *Political Geography,* Volume 26, Issue 6, pp. 627-638.

Nordhaus, W. 2007. Critical assumptions in the Stern Review on climate change. *Science,* Volume 317, pp. 201-202.

Næss, L.O., G. Bang, S. Eriksen, and J. Vevatne. 2005. Institutional adaptation to climate change: flood responses at the municipal level in Norway. *Global Environmental Change Part A*, Volume 15, Issue 2, pp. 125-138.

Næss, L.O., I. Thorsen Norland, W.M. Lafferty and C. Aall. 2006. Data and processes linking vulnerability assessment to adaptation decision-making on climate change in Norway. *Global Environmental Change*, Volume 16, Issue 2, pp. 221-233.

O'Brien, G., P. O'Keefe, J. Rose, and B. Wisner. 2006. Climate change and disaster management. *Disasters,* Volume 30, Issue 1, pp. 64-80.

O'Brien, G., P. O´Keefe, H. Meena, J. Rose and L. Wilson. 2008. Climate adaptation from a poverty perspective. *Climate Policy*, Volume 8, Issue 2, pp. 194-201.

O'Brien, K. and R. Leichenko. 2000. Double exposure: assessing the impacts of climate change within the context of economic globalization. *Global Environmental Change*, Volume 10, Issue 3, pp. 221-232.

O'Brien, K. and R. Leichenko. 2003. Winners and losers in the context of global change. *Annals of the Association of American Geographers*, Volume 93, Issue 1, pp. 99–113.

O'Brien, K. L., R. Leichenko, U. Kelkar, H. Venema, G. Aandahl, H. Tompkins, A. Javed, S. Bhadwal, S. Barg, L. Nygaard, and J. West. 2004. Mapping vulnerability to multiple stressors: Climate change and globalization in India. *Global Environmental Change*, Volume 14, Issue 4, pp. 303–313.

O'Brien, K., L. Sygna, and J.E. Haugen. 2004. Vulnerable or resilient? A multi-scale assessment of climate impacts and vulnerability in Norway. *Climatic Change*, Volume 64, Issue 1-2, pp. 193-225.

O'Brien, K.L. and R.M. Leichenko. 2006. Climate change, equity and human security. *Die Erde*, Volume 137. pp. 165–179.

O'Brien, K.L., S. Eriksen, L. Sygna, and L.O. Naess.2006. Questioning complacency: Climate change impacts, vulnerability, and adaptation in Norway. *AMBIO*, Volume 35 (2), pp. 50-56.

O'Brien, K.L., S. Eriksen, L.P. Nygaard, and A. Schjolden. 2007. Why different interpretations of vulnerability matter in climate change discourses. *Climate Policy*, Volume 7, Issue 1, pp. 73-88.

Olago, D., M. Marshall, S.O. Wandiga, M. Opondo, P.Z. Yanda, R. Kangalawe, A. Githeko, T. Downs, A. Opere, R. Kabumbuli, E. Kirumira, L. Ogallo, P. Mugambi, E. Apindi, F.

Githui, J. Kathuri, L. Olaka, R. Sigalla, R. Nanyunja, T. Baguma, and P. Achola. 2007. Climatic, socio-economic, and health factors affecting human vulnerability to cholera in the Lake Victoria basin, East Africa. *AMBIO*, Volume 36, Issue 4, pp. 350-358.

Owen, T. 2004. Human security – conflict, critique and consensus: Colloquium remarks and a proposal for a threshold-based definition. *Security Dialogue*, Volume 35, Issue 3, pp. 373-387.

Paavola, J. and W.N. Adger. 2006. Fair adaptation to climate change. *Ecological Economics*, Volume 56, Issue 4, pp. 594-609.

Pahl-Wostl, C. 2007. Transition towards adaptive management of water facing climate and global change. *Water Resources Management*, Volume 21, Issue 1, pp. 49-62.

Palmer, T. N. and J. Räisänen. 2002. Quantifying the risk of extreme seasonal precipitation events in a changing climate, *Nature*, Volume 415, pp. 512-514.

Parker, B. 2007. Understanding poverty and vulnerability in India's Uttar Pradesh and Bihar: A Q-squared approach. *World Development*, Volume 35, Issue 2), pp. 296-311.

Parkins, J. R. and N.A. MacKendrick. 2007. Assessing community vulnerability: A study of the mountain pine beetle outbreak in British Columbia, Canada. *Global Environmental Change*, Volume 17, pp. 460-471.

Parry, N. and C. Rosenzweig. 1993. Food supply and risk of hunger. *The Lancet,* Volume 342, pp. 1345–1347.

Parry, M., O. Canziani and J. Palutikof. 2008. Key IPCC conclusions on climate change impacts and adaptations. *Bulletin*, Volume 57, Issue 2, pp. 78-85.

Parry, M., J. Palutikof, C. Hanson, and J. Lowe. 2008. Climate policy: Squaring up to reality. *Nature Reviews: Climate Change [online]*. 29 May, 2008.

Patt, A., P. Suarez and C. Gwata. 2005. Effects of seasonal climate forecasts and participatory workshops among subsistence farmers in Zimbabwe. Proceedings of the National Academy of Sciences, Volume 102, pp. 12623-12628.

Pelling, M. and C. High. 2005. Understanding adaptation: What can social capital offer assessments of adaptive capacity? *Global Environmental Change*, Volume 15, Issue 4, pp. 308-319.

Penning-Rowsell, E., C. Johnson, and S. Tunstall. 2006. `Signals' from pre-crisis discourse: Lessons from UK flooding for global environmental policy change? *Global Environmental Change*, Volume 16, pp. 323-339.

Perch-Nielsen, S., M. Bättig and P. Imboden. 2008. Exploring the link between climate change and migration. *Climatic Change*, in press: DOI10.1007/s10584-008-9416-y

Pielke Jr., R. A. 2005. Are there trends in hurricane destruction? *Nature* 438.

Pielke Jr, R. A. 2007. Mistreatment of the economic impacts of extreme events in the Stern Review Report on the Economics of Climate Change. *Global Environmental Change*, Volume 17, pp. 302–310.

Pielke Jr, R.A. 2007. Future economic damage from tropical cyclones: Sensitivities to societal and climate changes. *Phil. Trans. R. Soc. A*, Volume 365, pp. 2717–2729.

Pielke Jr., R.A., C. Landsea, M. Mayfield, J. Laver and R. Pasch. 2005. Hurricanes and global warming. *Bulletin of the American Meteorological Society*, Volume 86, pp. 1571-1575.

Pielke, Jr. R.A. & D. Sarewitz. 2005. Bringing society back into the climate debate. *Population and Environment*, Volume 26, Issue 3, pp. 255-268.

Pielke Jr, R.A., G. Prins, S. Rayner, and D. Sarewitz. 2007. Climate change 2007: Lifting the taboo on adaptation. *Nature*, Volume 445, pp. 597-598.

Pielke. R.A., J. Gratz, C.W. Landsea, D. Collins, M. A. Saunders and R. Musulin. 2008. Normalized hurricane damage in the United States: 1900–2005. *Natural Hazards Review* (February), pp. 29-42.

Polack, E. 2008 forthcoming. A right to adaptation: securing the participation of marginalized groups. In Tanner, T. and Mitchell, T. (eds) Poverty in a changing climate. *IDS Bulletin* 2008.

Polsky, C., R. Neff and B. Yarnal. 2007. Building comparable global change vulnerability assessments: The vulnerability scoping diagram. *Global Environmental Change*, Volume 17, Issue 3-4, pp. 472-485.

Prabhakar, S.V.R.K and R. Shaw, R. 2008. Climate change adaptation implications for drought risk mitigation: a perspective for India. *Climatic Change*, Volume 88, Issue 2, pp. 113-130.

Reason, J.C., W., Landman, W., Tenant. 2006: Seasonal to decadal prediction of southern African climate and its links with variability in the Atlantic Ocean. *Bulletin of the American Meteorological Society*, Volume 87, Issue 7, pp. 941-955.

Regnier, P., B. Neri, S. Scuteri, and S. Miniati. 2008. From emergency relief to livelihood recovery: Lessons learned from post-tsunami experiences in Indonesia and India. *Disaster Prevention and Management,* Volume 17, Issue 3, pp. 410-429.

Reid, P. and C. Vogel. 2006. Living and responding to multiple stressors in South Africa—Glimpses from KwaZulu-Natal. *Global Environmental Change*, Volume 16, Issue 2, pp. 195-206.

Reidsma, P., F. Ewert, and A. Oude Lansink. 2007. Analysis of farm performance in Europe under different climatic and management conditions to improve understanding of adaptive capacity. *Climatic Change*, Volume 84, Issue 3-4, pp. 403-422.

Reilly, J. M. and D. Schimmelpfennig. 1999. Agricultural impact assessment, vulnerability, and the scope for adaptation. *Climatic Change*, Volume 43, Issue 4, pp. 745-788.

Reilly, J., S. Paltsev, B. Felzer, X. Wang, D. Kicklighter, J. Melillo, R. Prinn, M. Sarofim, A. Sokolov, and C. Wang. 2007. Global economic effects of changes in crops, pasture, and forests due to changing climate, carbon dioxide, and ozone. *Energy Policy*, Volume 35, pp. 5370–5383.

Reuveny, R. 2007. Climate change induced migration and violent conflict. *Political Geography*, Volume 26, Issue 6, pp. 656-673.

Roback, A. 2008. Whither geoengineering? *Science*, Volume 320, Issue 5, pp. 1166-1167.

Roncoli, C. 2006. Ethnographic and participatory approaches to research on farmers' responses to climate predictions. *Climate Research,* Volume 33, pp. 81-99.

Rosenzweig, C. and W.D., Solecki. 2001. Global environmental change and a global city: Lessons for New York. *Environment*, Volume 43, Issue 3, pp. 8–18.

Roy, M. and H. Venema. 2002. Reducing risk and vulnerability to climate change in India: the capabilities approach. *Gender and Development*, Volume 10, Issue 2, pp. 78-83.

Ruth, M. and D. Coelho. 2007. Understanding and managing the complexity of urban systems under climate change. *Climate Policy*, Volume 7, Issue 4, pp. 317-336.

Sabates-Wheeler, R. T. Mitchell and F. Ellis. (2008 forthcoming). Avoiding repetition: time for CBA to engage with the livelihoods literature. In Tanner, T. and Mitchell, T. (eds) Poverty in a chaining climate. *IDS Bulletin* 2008.

Sarewitz, D., Pielke Jr., R., and M. Keykhah. 2003. Vulnerability and risk: Some thoughts from a political and policy perspective. *Risk Analysis,* Volume 23, Issue 4, pp. 805 – 810.

Salehyan, I. 2008. From climate change to conflict? No consensus yet. *Journal of Peace Research*, Volume 45, Issue 3, pp. 315-326.

Schär, C., P. L. Vidale, D. Lüthi, C. Frei, C. Häberli, M. A. Liniger, and C. Appenzeller. 2004. The role of increasing temperature variability in european summer heatwaves. *Nature* 427: 332–336.

Scheffran, J. 2008. Climate change and security. *Bulletin of the Atomic Scientists*, Volume 64, Issue 2, pp. 19-25, 59-60.

Scheffer, M., V. Brovkin and P. Cox. 2006. Positive feedback between global warming and atmospheric CO 2 concentration inferred from past climate change. *Geophysical Research Letters*, Volume 33, L10702.

Schipper, L. and M. Pelling. 2006. Disaster risk, climate change and international development: Scope for, and challenges to, integration. *Disasters*, Volume 30, pp. 19–38.

Schipper, L. 2008. Reducing societal vulnerability to climate change. *Asian Disaster Management News*, Volume 14, Issue 1, pp. 7-8, Asian Disaster Preparedness Center.

Schröter, D., C. Polsky, and A. Patt. 2004. Assessing vulnerability to the effects of global change: An eight step approach. *Mitigation and Adaptation Strategies for Global Change*, Volume 10, pp. 573–595.

Schröter, D., W. Cramer and R. Leemans, C.I. Prentice, M.B. Araújo, N.W. Arnell, A. Bondeau, H. Bugmann, T.R. Carter, C.A. Gracia, A.C. de la Vega-Leinert, M. Erhard, F. Ewert, M. Glendining, J.I. House, S. Kankaanpää, R.J.T. Klein, S. Lavorel, M. Lindner, M.J. Metzger, J. Meyer, T.D. Mitchell, I. Reginster, M. Rounsevell, S. Sabaté, S. Sitch, B. Smith, J. Smith, P. Smith, M.T. Sykes, K. Thonicke, W. Thuiller, G. Tuck, S. Zaehle, B. Zierl. 2005. Ecosystem service supply and vulnerability to global change in Europe. *Science*, Volume 310, pp. 1333-1337.

Schwartz P. and D. Randall. 2003. An abrupt climate change scenario and its implications for United States national security. San Franciscio, Global Business Network. http://www.gbn.com/ArticleDisplayServlet.srv?aid=26231 Cited April 8 2007.

Shaw, R., M. Gupta, and A. Sarma 2003. Community recovery and its sustainability: Lessons from Gujarat earthquake of India. *The Australian Journal of Emergency Management*, Volume 18, Issue 2.

Simon, D. 2007. Urbanization and global environmental change: New intergenerational challenges. *In. J. Green Economics*, Volume 1, Numbers 3-4, pp. 299-306.

Skoufias, E. 2003. Economic crises and natural disasters: Coping strategies and policy implications. *World Development*, Volume 31, Issue 7, pp. 1087–1102.

Smit, B., I. Burton, R. Klein and R. Street. 1999. The science of adaptation: A framework for assessment. *Mitigation and Adaptation Strategies for Global Change*, Volume 4, Issue 3-4, pp. 199-213.

Smit, B., I. Burton, R. Klein and J. Wandel. 2000. An anatomy of adaptation to climate change and variability, *Climatic Change*, Volume 45, Issue 1, pp. 233–251.

Smit, B. and J. Wandel. 2006. Adaptation, adaptive capacity and vulnerability. *Global Environmental Change*, Volume 16, Issue 3, pp. 282-292.

Soderblom, J.D. 2008. Climate change: national & regional security threat multiplier for australia. Security Solutions, Volume 52, pp. 58-68.

Stern, N. and C., Taylor. 2007. Climate change: Risk, ethics and the Stern Review. *Science*, Volume 317, Issue 5835, pp. 203–204.

Stige, L.C., J. Stave, K.-S. Chan, L. Ciannelli, N. Pettorelli, M. Glantz, H.R. Herren and N.C. Stenseth. 2006. The effect of climate variation on agro-pastoral production in Africa. Proceedings of the National Academy of Sciences, Volume 103, pp. 3049-3053.

Stromberg, D. 2007. Natural disasters, economic development, and humanitarian aid. *The Journal of Economic Perspectives*, Volume 21, Issue 3, pp. 199-222(24).

Subbiah, A.R. 2008. Climate change adaptation and disaster risk management. *Asian Disaster Management News*, Volume 14 (1), pp. 3-4, Asian Disaster Preparedness Center.

Swart, R., J. Robinson, and S. Cohen. 2003. Climate change and sustainable development: Expanding the options. *Climate Policy*, Volume 3 (Supplement: Suppl. 1), pp. S19-S40.

Tanser, F., B. Sharp and D. le Sueur. 2003. Potential effect of climate change on malaria transmission in Africa. *The Lancet*, Volume 362, Issue 9398, pp. 1792-1798.

Tarhule, A. 2005. Damaging rainfall and flooding: The other Sahel hazards. *Climatic Change*, Volume 72, Issue 3, pp. 355-377.

Thomalla, F., T. Downing, E. Spanger-Siegfried, G. Han and J. Rockström. 2006. Reducing hazard vulnerability: towards a common approach between disaster risk reduction and climate adaptation. *Disasters*, Volume 30, Issue 1, pp. 39-48.

Thomas, D.S.G and C. Twyman. 2005. Equity and justice in climate change adaptation amongst natural-resource-dependent societies. *Global Environmental Change Part A*, Volume 15, Issue 2, pp. 115-124.

Thomas, D.S.G. C. Twyman, H. Osbahr and B. Hewiston. 2007. Adaptation to climate change and variability: Farmer responses to intra-seasonal precipitation trends in South Africa. *Climatic Change*, Volume 83, Issue 3, pp. 301-322.

Tol, R.S., T. Downing, O. Kuik, and J. Smith. 2004. Distributional aspects of climate change impacts. *Global Environmental Change*, Volume 14, pp. 259-272.

Tol, R.S.J. and G.W. Yohe. 2007. The weakest link hypothesis for adaptive capacity: An empirical test *Global Environmental Change*, Volume 17, Issue 2, pp. 218-227.

Tompkins, E. L. and W.N. Adger. 2004. Does adaptive management of natural resources enhance resilience to climate change? *Ecology and Society*, Volume 9, Issue 2, pp. 10.

Tompkins, E.L. 2005. Planning for climate change in small islands: Insights from national hurricane preparedness in the Cayman Islands. *Global Environmental Change Part A*, Volume 15, Issue 2, pp. 139-149.

Toya, H. and M. Skidmore. 2007. Economic development and the impacts of natural disasters. Economics Letters, pp. 20-25.

Trim, P.R.J. 2004. An integrative approach to disaster management and planning. *Disaster Prevention and Management*, Volume 13, Issue 3, pp. 218-225.

Tschakert, P. and L. Olsson. 2005. Post-2012 climate action in the broad framework of sustainable development policies: the role of the EU. *Climate Policy*, Volume 5, Issue 3, pp. 329-348.

Tschakert, P. 2007. Views from the vulnerable: Understanding climatic and other stressors in the Sahel. *Global Environmental Change*, Volume 17, Issue 3-4, pp. 381-396.

Turner, M.D. and T.O. Williams. 2002. Livestock market dynamics and local vulnerabilities in the Sahel. *World Development*, Volume 30, Issue 4, pp. 683-705.

Tyler, N., J. Turi, M. Sundset, K. Strøm Bulld, M. Sara, E. Reinert, N. Oskal, C. Nellemann, J. McCarthy, S. Mathiesen, M. Martello, O. Magga, G. Hovelsrud, I. Hanssen-Bauer, N. Eira, I. Eira and R. Corell. 2007. Saami reindeer pastoralism under climate change: Applying a generalized framework for vulnerability studies to a sub-arctic social–ecological system. *Global Environmental Change*, Volume 17, Issue 2, pp. 191-206.

Ulph, A. and D. Ulph. 2007. Climate change—environmental and technology policies in a strategic context. *Environmental and Resource Economics*, Volume 37, pp. 159-180.

van Aalst, M.K., Cannon, T., and I. Burton. 2008. Community level adaptation to climate change: The potential role of participatory community risk assessment. *Global Environmental Change*, Volume 18, Issue 1, pp. 165-179.

Vásquez-León, M., C.T. West and T.J. Finan . 2003. A comparative assessment of climate vulnerability: agriculture and ranching on both sides of the US–Mexico border. *Global Environmental Change*, Volume 13, Issue 3, pp. 159-173.

Vatsa, K.S. 2004. Risk, vulnerability, and asset-based approach to disaster risk management. *International Journal of Sociology and Social Policy*, Volume 4, Issue 10-11, pp. 1-48.

Vaughan, D.G., G.J. Marshall, W.M. Connolley, C. Parkinson, R. Mulvaney, D.A. Hodgson, J.C. King, C.J. Pudsey and J. Turner. 2003. Recent rapid regional climate warming on the Antarctic Peninsula. *Climatic Change*, Volume 60, pp. 243-274.

Velasquez, J. 2008. Disaster risk reduction and climate change adaptation- avaiding the unmanageable, managing the unavoidable. *Asian Disaster Management News*, Volume 14 (1), pp. 5-6, Asian Disaster Preparedness Center.

Vermark, J. and D. van Niekerk. 2004. Disaster risk reduction initiatives in South Africa. *Development Southern Africa*, Volume 21, Issue 3, pp. 555-574.

Vincent, K. 2007. Uncertainty in adaptive capacity and the importance of scale. *Global Environmental Change*, Volume 17, Issue 1, pp. 12-24.

Vogel, C. 2006. Foreword: Resilience, vulnerability and adaptation: A cross-cutting theme of the International Human Dimensions Programme on Global Environmental Change. *Global Environmental Change*, Volume 16, Issue 3, pp. 235-236.

Vogel, C., S.C. Moser, R.E. Kasperson, and G.D. Dabelko. 2007. Linking vulnerability, adaptation, and resilience science to practice: Pathways, players, and partnerships. *Global Environmental Change*, Volume 17, Issue 3-4, pp. 349-364.

Walker, B., B. Wisner, J. Leaning, and L. Minear. 2005. Smoke and mirrors: deficiencies in disaster funding. *BMJ,* Volume 330, Issue 7485, pp. 247-250.

Wang, G. 2005. Agricultural drought in a future climate: Results from 15 global climate models participating in the IPCC 4th Assessment. Climate Dynamics, Volume 25, pp. 739–753.

Waterston, T. 2006. Climate change – the greatest crisis for children? *Journal of Tropical Pediatrics*, Volume 52, Issue 6, pp. 383-385.

Webster, P.J., G.J. Holland, J.A. Curry and H.R. Chang. 2005. Changes in tropical cyclone number, duration, and intensity in a warming environment. *Science*, Volume 309, pp. 1844-1846.

Wellstead, A.M and R.C. Stedman. Coordinating future adaptation policies across Canadian natural resources. *Climate Policy*, Volume 7, Issue 1, pp. 29-45.

West, J.J., M.J. Small, and H. Dowlatabadi. 2001. Storms, investor decisions, and the economic impacts of sea level rise. *Climatic Change*, Volume 48, Issue 2-3, pp. 317-342.

Wilbanks, T.J. 2003. Integrating climate change and sustainable development in a place-based context. *Climate Policy*, Volume 3 (Supplement: Suppl. 1), pp. S147-S154.

Wilbanks, T.J. 2007. Scale and sustainability. *Climate Policy*, Volume 7, Issue 4, pp. 278-287.

Wilson, C. and T. Mcdaniels. 2007. Structured decision-making to link climate change and sustainable development. *Climate Policy*, Volume 7, Issue 4, pp. 353-370.

Winkler, H. and Vorster, S. 2007. Building bridges to 2020 and beyond: the road from Bali. *Climate Policy*, Volume 7, Issue 3, pp. 240-254.

Woodward, A., S. Hales and P. Weinstein. 1998. Climate change and human health in the Asia Pacific region: who will be most vulnerable? *Climate Research*, Volume 11, Issue 1, pp. 31-38.

Yamin, F. 2005. The European Union and future climate policy: Is mainstreaming adaptation a distraction or part of the solution? *Climate Policy*, Volume 5, Issue 3, pp. 349-361.

Yamin, F. and S. Huq (eds). 2005. Vulnerability, adaptation, and climate disasters: A conceptual overview. *IDS Bulletin,* Volume 36, Issue 4, pp. 1-13.

Yamin, F., T. Mitchell, and T. Tanner. 2005. Linking climate adaptation: a research agenda. *IDS Bulletin*, Volume 36, Issue 4.

Yohe, G.W. 2001. Mitigative capacity – The mirror image of adaptive capacity on the emissions side. *Climatic Change*, Volume 49, Issue 3, pp. 247-262.

Yohe, G. and R.S.J. Tol. 2002. Indicators for social and economic coping capacity—moving toward a working definition of adaptive capacity. *Global Environmental Change*, Volume 12, Issue 1, pp. 25-40.

Young, K.R and J.K. Lipton. 2006. Adaptive governance and climate change in the tropical highlands of Western South America. *Climatic Change*, Volume 78, Issue 1, pp. 63-102.

Young, O.R, F. Berkhout, G.C. Gallopinc, and M.A. Janssen, E. Ostrom, and S.van der Leeuw. 2006. The globalization of socio-ecological systems: An agenda for scientific research. *Global Environmental Change*, Volume 16, Issue 3, pp. 304-316.

Zhang, Y., M. Lindell and C.S. Prater. 2008. Vulnerability of community businesses to environmental disasters. *Disasters* (on-line, May 22 2008).

Ziervogel, G. 2004. Targeting seasonal climate forecasts for integration into household level decisions: the case of smallholder farmers in Lesotho. *The Geographical Journal*, Volume 170, Issue 1, pp. 6-21.

Ziervogel, G., S. Bharwani, and T.E. Downing. 2006. Adapting to climate variability: Pumpkins, people and policy. *Natural Resources Forum* 30: 294–305.

Zubair, L. 2004. Empowering the vulnerable, *Tiempo*, Volume 52, pp. 3–6.

Academic reports

Adamo. S. 2008. Addressing environmentally induced population displacements: A delicate Task. Background paper for the population-environment research network (PERN) cyberseminar on "*Environmentally Induced Population Displacements*."

Adger, W.N., N. Brooks, G. Bentham, M. Agnew, and S. Eriksen. 2003. *New indicators of vulnerability and adaptive capacity*. Technical Report 7, Tyndall Centre for Climate Change Research. Norwich: University of East Anglia.

Allen, K. 2003. *Changing vulnerability to flooding: community-based disaster preparedness in the Philippines*. University of Middlesex: PhD thesis for the Flood Hazard Research Centre.

American Meteorological Society. 2006. Is global warming impacting, or expected to impact, hurricanes? Science Seminar Series, October 20, 2006.

Anthoff, D., R.J. Nichols, R.S.J. Tol and A.T. Vafeidis. 2006. *Global and regional exposure to large rises in sea-level: A sensitivity analysis*. Working Paper No. 96. Tyndall Centre for Climate Change Research, University of East Anglia, Norwich.

Arnell, N.W. 2006. *Climate change and global water resources: A global perspective. avoiding dangerous climate change*. Symposium on Stabilization of Greenhouse gasses, 1-3 February 2005, Met. Office Hadley Centre for Climate Change, Exeter, UK. Department for Environment, Food and Rural Affairs, London.

Auld, H. 2007. *Disaster risk reduction under current and changing climate conditions.* Lecture, Geneva, 24 May 2007.

Bedford, R., E. Ho and J. Lidgard. 2000. International migration in New Zealand: context, components and policy issues. *Population Studies Centre Discussion Papers* (37). University of Waikato.

Baez, J.E. and I.V. Santos. 2007. Children's vulnerability to weather shocks: A natural disaster as a natural experiment. Social Science Research Network, New York.

Bals, C. 2006. *Increased scientific evidence for the link of climate change to hurricane intensity*. White paper presented at the workshop on "Climate change and disaster losses: understanding and attributing trends and projections", 25-26 May 2006, Hohemkammer, Germany.

Barnett, J. 2007. Climate change and security in Asia: Issues and implications for Australia. *Melbourne Asia Policy Paper no.9*. The University of Melbourne.

Bouwer, L.M. 2006. *The benefits of disaster risk reduction and their effects on loss trends*. White paper presented at the workshop on "Climate change and disaster losses: understanding and attributing trends and projections", 25-26 May 2006, Hohemkammer, Germany.

Brázdil, R. 2006. *Climate change and losses through natural disasters: Some remarks from experience in the Czech Republic*. White paper presented at the workshop on "Climate change and disaster losses: understanding and attributing trends and projections", 25-26 May 2006, Hohemkammer, Germany.

Brooks, H.E. 2006. *Tornado and severe thunderstorm damage*. White paper presented at the workshop on "Climate change and disaster losses: understanding and attributing trends and projections", 25-26 May 2006, Hohemkammer, Germany.

Buhaug, H., N. Gleditsch and O. Theisen. 2008. Implications of climate change for armed conflict. Paper presented at the World Bank Workshop on the Social Dimensions of Climate Change, The World Bank, Washington, 5-6 March 2008.

Burton, I. 2006. *The proximate, underlying and ultimate causes accounting for the increasing costs of weather related disasters: A diagnosis and prescription*. White paper presented at the workshop on "Climate change and disaster losses: understanding and attributing trends and projections", 25-26 May 2006, Hohemkammer, Germany.

Cannon, T., J. Twigg, and J. Rowell. 2004. *Social vulnerability, sustainable livelihoods and disasters. Investigating methodologies for vulnerability assessments and their links with the sustainable livelihoods approach.* London: Benfield Hazard Research Centre. 63 p.

Carter, M.R., D.L. Peter, T. Mogues and W. Negatu. 2005. *Shocks, sensitivity and resilience: Tracking the economic impacts of environmental disaster on assets in Ethiopia and Honduras*. Staff Paper No. 489. Department of Agricultural and Applied Economics, University of Wisconsin–Madison.

Centre for Strategic and International Studies (CSIS). 2007. *The age of consequences: The foreign policy and national security implications of global climate change.* Washington D.C., CSIS.

Claussen, E. 2007. *Global climate change*. Lecture at American College and University Presidents Climate Commitment Summit, 12 June 2007. Washington, DC. [http://www.pewclimate.org/press_room/ speech_transcripts/ec_acupcc]. August 2007.

Cline, W. 2007. *Global warming and agriculture: impact estimates by country*. Center for Global Development, Peterson Institute for International Economics, Washington, DC.

Crompton, R., J. McAneney and R. Leigh. 2006. *Natural disaster losses and climate change: an Australian perspective*. White paper presented at the workshop on "Climate change and disaster losses: understanding and attributing trends and projections", 25-26 May 2006, Hohemkammer, Germany.

Davis, I., Haghebaert, B. and D. Peppiatt. 2004. *Social vulnerability and capacity analysis*. Discussion paper and workshop report, Geneva, 25-26 May 2004.

Devereux, S. 2006. *The impacts of droughts and floods on food security and policy options to alleviate negative effects*. Paper submitted for plenary session on "Economics of Natural Disasters" International Association of Agricultural Economists (IAAE) conference. Gold Coast Convention and Exhibition Center, Queensland, Australia. 12–18 August. Institute of Development Studies, University of Sussex, Brighton.

Disaster Mitigation for Sustainable Livelihoods Programme (DiMP). 2005. *International workshop on community risk assessment*. Disaster Mitigation for Sustainable Livelihoods Programme, University of Cape Town, Cape Town, 31 May-2 June, 2005. 72 p.

Dlugolecki, A. 2006. *Thoughts about the impacts of climate change on insurance claims.* White paper presented at the workshop on "Climate change and disaster losses: understanding and attributing trends and projections", 25-26 May 2006, Hohemkammer, Germany.

Dupont, A and G. Pearman. 2006. *Heating up the planet: climate change and security*. Lowy Institute Paper 12. Double Bay, The Lowy Institute.

Enarson, E., L. Meyereles, B. Hearn Morrow, A. Mullings, and J. Soares. 2002. *Working with women at risk: practical guidelines for assessing local disaster risk.* Florida International University: International Hurricane Center.

Epstein, P.R. 2006. *Climate change and storms: The role of deep ocean warming*. White paper presented at the workshop on "Climate change and disaster losses: understanding and attributing trends and projections", 25-26 May 2006, Hohemkammer, Germany.

Eriksen, S., K. Ulsrud, J. Lind, and B. Muok. 2006. *The urgent need to increase adaptive capacities: Evidence from Kenyan drylands. Building climate adaptation into development policy in the Kenyan drylands.* Nairobi: African Centre for Technology Studies. 4 p.

Eriksen, S.E.H., O'Brien, K.L. and L. Rosentrater. 2007. *Climate change in Eastern and Southern Africa: Impacts, vulnerability and adaptation.* Report prepared for the Norwegian Ministry of Foreign Affairs. Oslo: GECHS Report 2.

Faust, E., P. Höppe, A. Wirtz and S. Schmidt. 2006. *Trends in natural catastrophes – potential role of climate change*. White paper presented at the workshop on "Climate change and disaster losses: understanding and attributing trends and projections", 25-26 May 2006, Hohemkammer, Germany.

Feinstein International Center. 2006. *The future of humanitarian action*. Briefing paper. Tufts University. 7 p.

Ferris, E. 2007. *Making sense of climate change, natural disasters and displacement: a work in progress. Lecture at the Calcutta Research Group Winter Course, 14 December 2007.* Washington DC: Brookings Institution. 13 p.

Franco, G. 2005. *Climate change impacts and adaptation in California*. Support document to the 2005 Integrated Energy Policy Report. Staff Paper. California Energy Commission, Sacramento.

Fritschel, H. 2006. How will agriculture adapt to a shifting climate? IFPRI *FORUM.* Washington DC: International Food Policy Research Institute. 12 p.

Goklany, I.M. 2006. *Death and death rates due to extreme weather events: global and U.S. trends, 1900-2004*. White paper presented at the workshop on "Climate change and disaster losses: understanding and attributing trends and projections", 25-26 May 2006, Hohemkammer, Germany.

Green, C. 2003. *Change, risk and uncertainty: managing vulnerability to flooding*. Paper presented at Meeting "Third Annual DPRI-IIASA Meeting; Integrated Disaster Risk Management: Coping with Regional Vulnerability", 3-5 July 2003, Kyoto.

Grenier, H. 2006. *Climate change and disaster losses: understanding and attributing losses and projections*. White paper presented at the workshop on "Climate change and disaster losses: understanding and attributing trends and projections", 25-26 May 2006, Hohemkammer, Germany.

Guha-Sapir, D. Hargitt, and P. Hoyois, 2004. *Thirty years of natural disasters: 1974-2003: The Numbers*. Brussels: Centre for Research on the Epidemiology of Disasters. 190 p.

Gurjar, B.R., L.M. Ciumasu, N. Costica, A. Kumar and C.S.P. Ojha. 2006. *Overexploitation of ecosystem resources vs. the costs of storms and flooding risk management*. White paper presented at the workshop on "Climate change and disaster losses: understanding and attributing trends and projections", 25-26 May 2006, Hohemkammer, Germany.

Hallegatte, S. 2005. *Accounting for extreme events in the economic assessment of climate change*. FEEM Working Paper No. 01.05.

Hansen, J. 2007. *Dangerous human-made interference with climate*. Testimony to select committee on energy independence and global Warming, United States House of Representatives, 26 April, Washington, DC.

Hay, J.E. 2002. *Integrating disaster risk management and adaptation to climate variability and change: needs, benefits and approaches, from a South Pacific Perspective*. Paper presented at UNDP Expert Group Meeting "Integrating Disaster Reduction and Adaptation to Climate Change", Havana, Cuba, 17-19 June 2002. Havana: UNDP.

Haynes, K., Mitchell, T. and T. Tanner. 2008. *Children's voices for disaster risk reduction: lessons from El Salvador and the Philippines*. IDS working paper, Brighton, IDS.

Heijmans, A. 2001. *Vulnerability: a matter of perception.* Disaster Management Working Paper for Benfield Hazard Research Centre, University College of London.

Hellmuth, M.E. et al (eds). 2007. *Climate risk management in Africa: learning from practice*. International Research Institute for Climate and Society (IRI). New York: Columbia University. 116 p.

Helminen, J. 2006. *Finnish local view on the factors accounting for the costs of weather-related disasters (specifically, floods and storms) in recent decades and implications of understanding these for both research and policy*. White paper presented at the workshop on "Climate change and disaster losses: understanding and attributing trends and projections", 25-26 May 2006, Hohemkammer, Germany.

Huq, S., H. Reid, and L. A. Murray. 2006. Climate change and development links. *Gatekeeper Series*, No.123, London: International Institute for Environment and Development.

Höppe, P. and R.A. Pielke, Jr. (eds). 2006. *Workshop on climate change and disaster losses: understanding and attributing trends and projections.* Final Workshop Report. Hohenkammer, Germany, 25-26 May.

Institute of Development Studies (IDS). 2007. *Climate change adaptation*. IDS in Focus, November 2007.

International Peace Academy. 2007. *Climate change and conflict: the migration link*. Coping with Crisis, Working Paper Series. New York: International Peace Academy.

International Research Institute for Climate and Society (IRI). 2007. Climate risk management in Africa: Learning from practice. *Climate and Society* No 1. The Earth Institute, Columbia University, New York.

Jarmin, R. and J. Miranda. 2006. *The impact of hurricanes Katrina, Rita, and Wilma on business establishments: A GIS approach.* Working Paper 06-23. U.S. Census, Center for Economic Studies, Washington, DC.

Jorgenson, D.W., R.J. Goettle, B.H. Hurd, and J. B. Smith. 2004. *U.S. market consequences of global climate change.* Pew Center on Global Climate Change.

Jun, S. 2006. *A brief review on reasons and implications of the increasing disaster losses*. White paper presented at the workshop on "Climate change and disaster losses: understanding and attributing trends and projections," 25-26 May 2006, Hohemkammer, Germany.

Kemfert, C. and K. Schumacher. 2006. *Cost of inaction and costs of action in climate protection. Assessment of costs of inaction or delayed action of climate protection and climate change.* White paper presented at the workshop on "Climate change and disaster losses: understanding and attributing trends and projections," 25-26 May 2006, Hohemkammer, Germany.

Khan, M.A. 2007. *Disaster preparedness for natural hazards: current status in Pakistan. How prepared is Pakistan for natural disasters?* Kathmandu: International Centre for Integrated Mountain Development.

Knutson, T. 2006. *Perspectives on focused workshop questions regarding past economic impacts of storms or floods*. White paper presented at the workshop on "Climate change and disaster losses: understanding and attributing trends and projections", 25-26 May 2006, Hohemkammer, Germany.

Leary, N., J. Adejuwon, W. Bailey, V. Barros, M. Caffera, S. Chinvanno, C. Conde, A. De Comarmond, A. De Sherbinin, T. Downing, H. Eakin, A. Nyong, M. Opondo, B. Osman, R. Payet, F. Pulhin, J. Pulhin, J. Ratnasiri, E. Sanjak, G. von Maltitz, M. Wehbe, Y. Yin and G. Ziervogel. 2006. *For whom the bell tolls: Vulnerability in a changing climate*. A Synthesis from the AIACC project. AIACC Working Paper No. 21. Florida: International START Secretariat.

Leary, N., J. Kulkarni and C. Seipt. 2007. *Assessment of impacts and adaptation to climate change: final report of the AIACC project. How will the poor be affected by climate change?* Global Change System for Analysis, Research and Training. 250 p.

Lonergan, S. 1998. The role of environmental degradation in population displacement. Environmental Change and Security Project Report No. 4, pp. 5-15.

Macqueen, D. and S. Vermeulen. 2006. *Climate change and forest resilience. Learning from forest-based livelihoods for mitigation, risk reduction and adaptation to climate change.* International Institute for Environment and Development.

Maundern, N. 2006: *The impact of food aid on grain markets in southern Africa: implications for tackling chronic vulnerability, a review of evidence.* Johannesburg: Regional Hunger and Vulnerability Programme (RHVP).

Mitchell, T. and T. Tanner. 2007. Embedding climate change adaptation in the development process. *In-Focus*, Issue 2 (1), Institute of Development Studies (IDS), 2 p.

Mitchell, T. and Haynes, K. 2007. Role of children in adapting to climate change. *In-Focus*, Issue 2 (4), Institute of Development Studies, UK, 2 p.

Molle, F. 2006. *Planning and managing water resources at the river-basin level: emergence and evolution of a concept. Promoting a political ecology perspective on river-basin water management.* Colombo: Comprehensive Assessment of Water Management in Agriculture (IWMI). 42 p.

Moreno, J.M. 2007. *Forest Fire Research Needs in Europe in a Context of Climate and Global Change*. Working document presented at the "Think-tank meeting on research needs in natural hazards: Forest fires (in a climate change context) and related to multi-hazard/risk perspectives". DG Research, Brussels, 12-13 November, 2007.

Mousseau, F. and A. Mittal. 2006. *Sahel: A prisoner of starvation? A case study of the 2005 food crisis in Niger*. The Oakland Institute, California.

Muir-Wood, R., S. Miller and A. Boissonade. 2006. *The search for trends in a global catalogue of normalized weather-related catastrophe losses*. White paper presented at the workshop on "Climate change and disaster losses: understanding and attributing trends and projections", 25-26 May 2006, Hohemkammer, Germany.

Muller, B. 2002. *Equity in climate change*: The great divide. Oxford Institute for Energy Studies. EV31.

Möhner, A., and R.J.T. Klein. 2007. *The Global Environment Facility: Funding for adaptation or adapting to funds.* SEI Climate and Energy Programme Working Paper, 26 p.

Nordhaus, W. 2006. *The economics of hurricanes in the United States*. Department of Economics, Yale University. Working Paper.

Nyong, A. 2006-2007. Climate-Related Conflicts in West Africa. *Report from Africa – Population, health, environment and conflict.* Environmental Change and Security Program Report. pp. 36-43.

Okuyama, Y. 2003. *Economics of natural disasters: A critical review.* Research Paper 2003-12. Regional Research Institute. West Virginia University.

Oliver-Smith, A. 2006. Disasters and forced migration in the 21st Century. In Social Science Research Council, *Understanding Katrina: Perspectives from the social sciences*. Accessed 15 June 2007 http://understandingkatrina.ssrc.org/Oliver-Smith/

Page, E.A. 2006. *Climate change, justice and future generations*. Cheltenham: Edward Elgar. [http://www2.warwick.ac.uk/fac/soc/pais/staff/page/publications/]. July 2007.

Perry, M., A. Dulio, S. Artiga, A. Shartzer and D Rousseau. 2006. *Voices of the storm. Health experiences of low-income Katrina survivors*. Henry J. Kaiser Foundation, California.

Pielke, Jr., R.A. 2006. *Understanding and attribution trends and projections*. White paper presented at the workshop on "Climate change and disaster losses: understanding and attributing trends and projections", 25-26 May 2006, Hohemkammer, Germany.

Pielke Jr., R.A. and P. Höppe. 2006. *Report of the Workshop on "Climate change and disaster losses: understanding and attributing trends and projections"*, 25-26 May 2006, Hohemkammer, Germany.

Polack, E. and E. Choi. 2007. Building climate change resilient cities. *In-Focus*, Issue 2 (6), Institute for Development Studies (IDS), UK, 2 p.

Raleigh, C., Jordan, L. and Salehyan, I. 2008. *Assessing the impact of climate change on migration and conflict*. Paper prepared for the World Bank Seminar on Exploring the Social Dimensions of Climate Change. March 2008.

Reid, H. and S. Huq. 2007. *Community-based adaptation: A vital approach to the threat climate change poses to the poor.* International Institute for Environment and Development (IIED). Briefing Paper, London: IIED.

Roson, R. A. Calzadilla, and F. Pauli. 2006. *Climate change and extreme events: An assessment of economic implications.* FEEM Working Paper No. 44.

Satterthwaite, D., S. Huq, M. Pelling, H. Reid and P. L. Romero. 2007. *Adapting to climate change in urban areas; The possibilities and constraints in low- and middle-income nations*, IIED Working Paper, IIED, London, 107 pages.

Schröter, D., M. Zebisch & T. Grothmann. 2005. *Climate change in Germany – vulnerability and adaptation of climate-sensitive sectors*. Klimastatusbericht. [http://www.schroeter-patt.net/Schroeter-et-al-KSB06.pdf]. July 2007.

Segnestam, L., L. Simonsson, J. Rubiano and M. Morales. 2006. *Cross-level institutional processes and vulnerability to natural hazards in Honduras*. Stockholm: Stockholm Environment Institute (SEI).

Soussan, J. and I. Burton. 2002. *Adapt and thrive: Combining adaptation to climate change, disaster mitigation, and natural resources management in a new approach to the reduction of vulnerability and poverty.* Paper presented at the UNDP Expert Group Meeting, "Integrating Disaster Reduction and Adaptation to Climate Change", Havana, Cuba, 17-19 June 2002, Havana: UNDP.

Stephens, C., R. Patnaik and S. Lewin. 1995. *This is my beautiful home: risk perceptions towards flooding and environment in low-income urban communities: A case study in Indore, India.* London: London School of Hygiene and Tropical Medicine.

Tacoli, C. 2007. *Mitigation and adaptation to climate change*. Sustainable Development Opinion. London: International Institute for Environment and Development (IIED).

Tanner T.M., A. Hassan, K.M.N. Islam, D. Conway, R. Mechler, A.U. Achmed and M. Alam. 2007. *ORCHID: Piloting climate risk screening in DFID Bangladesh.* Research report. Institute of Development Studies, University of Sussex, Brighton.

Tanner, T. and T. Mitchell. 2007. Pro-poor climate change adaptation: a research agenda. *In-Focus*, Issue 2 (2), Institute of Development Studies (IDS), UK, p. 2.

Tanner, T.M. and T. Mitchell. 2007. *Entrenchment or enhancement: could climate change adaptation help reduce chronic poverty?* Chronic Poverty Research Centre, Working Paper (draft in review). University of Manchester: Chronic Poverty Research Centre.

The Energy and Resources Institute (TERI) & International Institute for Sustainable Development (IISD). 2006: *Designing policies in a world of uncertainty and surprise, adaptive policy-making for agriculture and water resources in the face of climate change*, *Phase One.* Research Report.

Tompkins, E.L. 2006. *Factors affecting economic losses from tropical storms in the Cayman Islands*. White paper presented at the workshop on "Climate change and disaster losses: understanding and attributing trends and projections", 25-26 May 2006, Hohemkammer, Germany.

Turner, M.A. and S.R. Zedlewski. 2006. *After Katrina. Rebuilding opportunity and equity into the New New Orleans*. The Urban Institute, Washington, DC.

Twigg, J. 2007. Disaster reduction terminology: a common-sense approach. *Humanitarian Exchange*, Number 38, pp. 2-5.

von Storch, H. and Ralf Weisse. 2006. *Regional storm climate and related marine hazards in the NE Atlantic*. White paper presented at the workshop on "Climate change and disaster losses: understanding and attributing trends and projections", 25-26 May 2006, Hohemkammer, Germany.

Walker, P. et al. 2007. Disaster risk reduction: a front line defense against climate change and displacement. Internal Displacement and InterAction Joint Seminar. Brookings-Bern Project on Internal Displacement. Washington DC: The Brookings Institution.

Watson, R. 2006. Costs and benefits of addressing the climate change challenge. Presentation at the Meeting of climate experts and development practitioners, September 26, 2006.

Warren, R., N. Arnell, R. Nicholls, P. Levy and J. Price. 2006. *Understanding the regional impacts of climate change*. Research Report Prepared for the Stern Review on the Economics of Climate Change. Research Working Paper No. 90. Tyndall Centre for Climate Change, Norwich.

Weitzman, M.L. 2008. *On modeling and interpreting the economics of catastrophic climate change*. Working Paper. Cambridge, MA: Department of Economics, Harvard University.

Wisner, B., M. Fordham, I. Kelman, B. R. Johnson, D. Simon, A. Lavell, H. Günter Brauch, U. Oswald Spring, G. Wilches Chaux, M. Moench, and D. Weiner. 2007. Climate change and human security. RADIX: Home for Radical Interpretations of Disasters
and Radical Solutions. Assessed August 18 2008: http://www.radixonline.org/cchs.html

Worthington, A. and A. Valadkhani. 2005. *Catastrophic shocks and capital markets: A comparative analysis by disaster and sector*. Economics Working Paper 05-20, University of Wollongong.

Ye, Q. 2006. *Factor analysis of disaster losses: China case study*. White paper presented at the workshop on "Climate change and disaster losses: understanding and attributing trends and projections", 25-26 May 2006, Hohemkammer, Germany.

Yodmani, S. 2001. *Disaster risk management and vulnerability reduction: protecting the poor*. Paper presented at the Asia and Pacific Forum on Poverty, Asian Development Bank, Manila 5-9 February 2001.

Young, H., S. Jaspars, R. Brown, J. Frize, and H. Khogali. 2001. *Food-security assessments in emergencies: a livelihoods approach*. Humanitarian Practice Network. HPN network paper No.36.

Zapata-Marti, R. 2006. *Disaster's impact: understanding and attributing trends and projections of damage and losses. The ECLAC Perspective*. White paper presented at the workshop on "Climate change and disaster losses: understanding and attributing trends and projections", 25-26 May 2006, Hohemkammer, Germany.

Books and book chapters

Adger, W.N. 2003. Social aspects of adaptive capacity. In: Smit, J.B. Klein, R.T. & Huq, S. (eds), *Climate change, adaptive capacity and development.* London: Imperial College Press.

Adger, W.N. and N. Brooks. 2003. Does global environmental change cause vulnerability to disaster?. In Pelling, M. (ed) *Natural disasters and development in a globalising world*. London: Routledge.

Adger, W.N., J. Barnett and H. Ellemor. 2008. Unique and valued places at risk. In Armin Rosencranz and Stephen Schneider (eds.). *Climate change science and policy*: Island Press. in press.

Adger, W.N., J. Paavola, M. Mace and S. Huq (Eds). 2006. *Fairness in adaptation to climate change*. MIT Press, Cambridge MA.

Anderson, M.B. and P.J. Woodrow. 1989. *Rising from the ashes: Development strategies in times of disaster (2nd ed)*. Boulder: Lynne Rienner Publishers. London: IT Press.

Baechler, G. 1999. *Violence through environmental discrimination: Causes, Rwanda arena and conflict model*. Kluwer: Dordrecht.

Baer, P. 2006. Adaptation: Who pays whom? In W. N. Adger, J. Paavola, S. Huq & M. J. Mace (Eds.) *Fairness in adaptation to climate change*, Cambridge Mass.: MIT Press.

Bankoff, G. Frerks, G., and Hilhorst, D. (eds). 2004. *Mapping vulnerability: Disasters, development and people*. London: Earthscan. 236 p.

Birkmann, J. (ed.) 2006. *Measuring vulnerability to natural hazards. Towards disaster resilient societies*. Tokyo: United Nation University Press.

Bogardi, J. and J. Birkmann. 2004. Vulnerability assessment: The first step towards sustainable risk reduction. In Malzahn, D. & Plapp, T. (eds). *Disaster and society – from hazard assessment to risk reduction*. Berlin: Logos Verlag Berlin, pp. 75-82.

Boyden, J. and Gillian Mann. 2005. Children's risk, resilience, and coping in extreme situations. In Ungar, M (ed). *Handbook for working with children and youth: Pathways to resilience across cultures and contexts*. London; Sage Publications, pp. 3-27.

Brauch, H.G., J. Grin, C. Mesjasz, P. Dunay, P. Chadha, N. Pal, B. Chourou, U. Oswald Spring, P.H. Liotta, P. Kameri-Mbote, (eds). 2007. *Globalisation and environmental challenges: reconceptualising security in the 21st Century*. Hexagon series on human and environmental security and peace, vol. 3. Springer: Berlin.

Burton, I., Kates, R.W., and G.F. White. 1993. *The environment as hazard (2nd ed)*. New York: Guilford Press.

Cannon, T. 1994. Vulnerability analysis and the explanation of "natural" disasters. In *disasters, development, and environment*, ed. Ann Varey, 13–30. Chichester: John Wiley.

Cannon, T. 2000. Vulnerability and disasters, in Parker, D. (ed.) *Floods*, pp. 43-55. London: Routledge.

Chambers, R. 1997. *Whose reality counts? Putting the first last.* London: Intermediate Technology Publications.

Committee on disaster research in the social sciences: Future challenges and opportunities,

National Research Council. 2006. *Facing hazards and disasters: understanding human dimensions*. The National Academies Press.

Connell, J. and R. King. 1990. Island migration in a changing world. In: King, R. and Connell, J. (Eds.) *Small worlds, global lives: Islands and migration*. Pinter Publications, London, pp. 1-26.

Diamond, J. 2004. *Collapse: How societies choose to fail or to succeed*. Viking: New York.
Dore, M.H.I. and D. Etkin. 2003. Natural disasters, adaptive capacity and development in the twenty-first century. In *Natural disasters and development in a globalizing world*, (ed.) M. Pelling, 75–91. London: Routledge.
Eakin, H. 2006. *Weathering risk in rural Mexico: Economic, climatic and institutional change*. Tucson: University of Arizona Press.
Epstein, P.R. and E. Mills (eds.). 2005. *Climate change futures: Health, ecological and economic dimensions*. The Center for Health and the Global Environment, Harvard Medical School, Cambridge, Massachusetts.
Faist, T. 2000. *The volume and dynamics of international migration and transnational social spaces*. Oxford University Press, Oxford.
Fordham, M. 2003. Gender, disaster and development: the necessity for integration. In Pelling, M. (eds) *Natural disasters and development in a globalizing world*. Routledge: London, pp. 57-74.
Franke, R. and B. Chasin. 1980. *Seeds of famine*. New Jersey: Rowman and Allanheld.
Gunewardena, N. and M. Schuller. 2008. *Capitalizing on catastrophe: Neoliberal strategies in disaster reconstruction*. London: Altamira Press.
Hewitt, K. 1983. *Interpretations of calamity: From the viewpoint of human ecology*. London: Allen & Unwin.
Hewitt, K. 1997. *Regions of risk. A geographical introduction to disasters*. Harlow: Addison Wesley Longman.
Ingleton, J. 1999. *Natural disaster management.* Tudor Rose (Bhatt M. pp. 94-95, Davis I. and Hall N. pp. 87-89, Maskrey A. pp. 84-86, Parker D. pp. 38-40).
Kahl, C. 2006. *States, scarcity, and civil strife in the developing world*. Princeton University Press: New Jersey.
Keskitalo, E.C. 2008. *Climate change and globalization in the arctic: An integrated approach to vulnerability assessment*. Earthscan, London.
Leary, N., C. Conde, J. Kulkarni, A. Nyong, and J. Pulhin (eds). 2008. *Climate change and vulnerability*. Earthscan, London.
Leary, N., J. Adejuwon, V. Barros, I. Burton, J. Kulkarni and R. Lasco. (eds). 2008. *Climate change and adaptation*. Earthscan, London.
Leichenko, R.M. and K.L. O'Brien. 2008. *Environmental change and globalization: Double exposures*. New York: Oxford University Press.
Lovejoy, T. E. and L.J. Hannah (Eds). 2005. *Climate change and biodiversity*. Yale University Press: New Haven.
Macpherson, C. and L. Macpherson. 1990. The changing contours of migrant Samoan kinship. In: King, R. and Connell, J. (Eds.), *Small worlds, global lives: Islands and migration*. Pinter Publications, London, pp. 277-296.
Maskrey, A. 1989. *Disaster Mitigation: A community based approach.* Oxford: Oxfam.
McCracken, M. C., More, F. and Topping, J.C Jr (eds.). 2007. *Sudden and disruptive climate change: Exploring the real risks and how we can avoid them*. Earthscan UK.
McMichael, A.J., D.H. Campell-Lendrum, C.F. Corvalán, K.L. Ebi, A. Githeko, J.D. Scheraga and A. Woodward. 2003. Chapter 1: Global climate change and health: An old story writ large. In: *Climate change and human health—risks and responses*. Geneva: World Health Organization.
Mileti, D. 1999. *Disasters by design: A reassessment of natural hazards in the United States*. Washington, D.C.: Joseph Henry Press.
Mitchell, K, (ed.). 1999. *Crucibles of hazards: Megacities and disasters in transition*. Toyko: United Nations University Press.
Moreno, J.M. Zavala, G. Martin, M. and A. Millan. 2008. Forest fire risk in Spain under future climate change. In J. Settele et al. (eds.) Atlas of biodiversity risks – from Europe to the globe, from stories to maps. Pensoft, Sofia and Moscow.

Morrow, B.H. and W.G. Peacock. 1997. Disasters and social change: Hurricane Andrew and the reshaping of Miami. In Peacock, W.G., B.H. Morrow and H. Gladwin (eds.), *Hurricane Andrew: Ethnicity, gender and the sociology of disasters*, 226-242. New York: Routledge.

O'Brien, K.L. and H.C. Vogel (eds). 2003. *Coping with climate variability: The use of seasonal climate forecasts in Southern Africa*. Aldershot: Ashgate Publishing.

Oderth, R. 2002. *An introduction to the study of human migration: An interdisciplinary perspective*. Writers Club Press, Lincoln.

Okuyama, Y. and S Chang. (eds). 2004. *Modeling spatial and economic impacts of disasters*. Springer. (6-12-08).

O'Neill, Karen M. 2006. *Rivers by design; state power and the origins of U.S. flood control.* Durham, NC: Duke University Press.

Parker, D. 2000. *Floods: Volume 1& 2.* London and New York: Routledge.

Pelling, M. 2003. *The vulnerability of cities: Natural disasters and social resilience*. London: Earthscan.

Pelling, M. (ed) 2003. *Natural disasters and development in a globalizing world*. New York and London: Routledge.

Ravuvu, A. 2002. Security and confidence as basis factors in Pacific Islanders' migration. In: Spickard, P., Rondilla, J. and Wright, D. (Eds.), *Pacific diaspora: Island peoples in the United States and across the Pacific*. University of Hawaii Press, Honolulu, pp. 87-98.

Roberts, J. T. and B. Parks. 2006. *A climate of injustice: Global inequality, North-South politics, and climate policy.* Cambridge: MIT Press.

Sen, A. 1981. *Poverty and famines: An essay on entitlement and deprivation.* Oxford: Oxford University Press.

Sen, A. 1999. *Development as freedom*. Anchor Books, New York.

Smith, K. 1996. *Environmental hazards: Assessing risk and reducing disaster*. Routledge, London.

Smith, D., J. Vivekananda. 2007. *A climate of conflict: The links between climate change, peace and war*. London: International Alert.

Smith, J., H. Schellnhuber and M. Mirza. 2001. Vulnerability to climate change and reasons for concern: A synthesis. In McCarthy, J. Canziani, O. Leary, N. Dokken, D. White, K. (eds). 2001. *Climate change 2001: Impacts, adaptation & vulnerability*. Cambridge University Press, Cambridge: 914-967.

Stern, N. 2007. *The economics of climate change: The Stern review*. New York: Cambridge University Press.

Tierney, K. M. Lindell, and R.W. Perry. (eds). 2001. *Facing the unexpected: Disaster preparedness and response in the United States*. Joseph Henry Press: Washington, D.C.

Trujillo, M. 2000. *Risk-mapping and local capacities: Lessons from Mexico and Central America*. Oxford: Oxfam.

Ungar, M. (ed). 2005. *Handbook for working with children and youth: Pathways for resilience across cultures and contexts*. London: Sage Publications.

Wisner, B. P. Blaikie, T. Cannon, and I. Davis. 2004. *At risk: Natural hazards, people's vulnerability and disasters* (2nd ed). London and New York: Routledge.

Wolf, J., I. Lorenzoni, R. Few, V. Abrahmson and R. Raine. 2009. Conceptual and practical barriers to adaptation: An interdisciplinary analysis of vulnerability and response to heat waves in the UK. In Adger, W.N., Lorenzoni I. and O'Brien K. (eds.) *Adapting to climate change: Thresholds, values, governance.* Cambridge: Cambridge University Press (in press).

Agency and NGO reports

ActionAid International. 2005. *Participatory vulnerability analysis: a step- by-step guide for field staff*. London: Action Aid. 34 p.

ActionAid International. 2006. *Lessons for life: building a culture of safety and resilience to disasters through schools*. A Briefing Paper prepared by Campbell, J and R. Yates.

ActionAid International. 2006: *Climate change and smallholder farmers in Malawi, understanding poor people's experiences in climate change adaptation.* London and Johannesburg: Action Aid. 8 p.

Action Aid International. 2007. *Unjust waters: climate change, flooding and the protection of poor urban communities: experiences from six African cities. Africa's urban poor are struggling to cope with climate-induced flooding*. London: Action Aid International. 28 p.

Adinolfi, C., D.S. Bassiouni, H. Fossum Lauritzsen, and H.R.Williams. 2005. *Humanitarian response review*. New York and Geneva: United Nations Emergency Relief Coordinator & Under-Secretary-General for Humanitarian Affairs, Office for the Coordination of Humanitarian Affairs (OCHA).

African Development Bank (AfDB). 2003. *Humanitarian emergency relief support to the victims of the 2002 drought in Ethiopia and Eritrea.* Country Operations Department – ADF (ONCF). Agriculture and Rural Development Department (ONAR). 21 p.

African Development Bank (AfDB), Asian Development Bank (ADB), Department for International Development (DFID), Directorate-General for Development, European Commission, Federal Ministry for Economic Cooperation and Development, Germany Ministry of Foreign Affairs – Development Cooperation, The Netherlands Organization for Economic Cooperation and Development, United Nations Development Programme, United Nations Environment Programme, The World Bank. 2003. *Poverty and climate change, reducing the vulnerability of the poor through adaptation.* Washington, DC: The World Bank. 56 p.

African Union, Commission of the African Union, United Nations International Strategy for Disaster Reduction and The World Bank, 2008. *Report on the status of disaster risk reduction in the Sub-Saharan Africa region*.

Agrawala, S. (ed). 2005. *Bridge over troubled waters. Linking climate change and development*. Paris: Organization for Economic Co-operation and Development.

Ahmed, R. 2007. *Risk management, vulnerability and natural disasters in the Caribbean*. Report prepared for the International federation of Red Cross. 43 p.

Ahmed, S., S. Chopde, A. Dixit, A. Pokhrel and D.Raj Rai, S. Janakarajan, F. Khan, M. Moench, S. Opitz-Stapleton, D. Mustafa, M. Upadhya, K. Mani Dixit, M. Devkota, S. A. Wajih, and A. Kumar. 2007. *Working with winds of change. Towards strategies for responding to the risks associated with climate change and other hazards*. Second edition, Moench, M. and A Dixit (eds). ProVention Consortium, Institute for Social and Environmental Transition-International and Institute for Social and Environmental Transition-Nepal.

Alan Shawn Feinstein International Famine Center. 2004. *Ambiguity and change: humanitarian NGOs prepare for the future*. A report prepared for: World Vision, CARE, SveUs, Mercy Corps, Oxfam USA GB and Catholic Relief Services.

Annan, K. 2007. *Launch of the global humanitarian forum*. Speech at the Global Humanitarian forum, Musée Ariana, Geneva, 17 October 2007.

Arnold, M. 2008. *The role of risk transfer and insurance in disaster risk reduction and climate change adaption*. Policy brief for the Commission on Climate Change and Development.

Asian Development Bank. 2004. *Climate proofing: a risk-based approach to adaptation*. ADB report tar-reg-6064-final. Manila: Asian Development Bank.

Association of British Insurers (ABI). 2005. *Financial risks of climate change*. Summary report. London: ABI. 40 p.

Bartlett, S. 2008. *Climate change and urban children: Impacts and implications for adaptation in low and middle income countries*. Human Settlements Discussion Paper, Climate Change 2, 2008)

Barr, N. 2005. *The changing social landscape of rural Victoria*, Department of Primary Industries, Victoria, 2005.

Beck, T. 2005. *South Asia earthquake 2005 – Learning from previous earthquake relief operations.* ALNAP/ProVention Consortium. 13 p.

Beck, T. 2005. *South Asia earthquake 2005 – Learning from previous recovery operations.* ALNAP/ProVention Consortium. 15 p.

Beck, T. 2005. Learning lessons from disaster recovery: The Case of Bangladesh. Washington DC: *Disaster Risk Management Working Paper Series No. 11.* The World Bank, Hazard Management Unit. 46 p.

Benson, C. and J. Twigg. 2004. *Integrating disaster reduction into development: recommendations for policy-makers.* IFRC/ProVention Consortium. Geneva. 4 p.

Benson, C. and J. Twigg. 2004. *Measuring Mitigation: Methodologies for assessing natural hazard risks and the net benefits of mitigation – A scoping study/ Synthesis report.* Geneva: IFRC/ ProVention Consortium. 154 p.

Benson, C. and J. Twigg, with T. Rossetto. 2007. *Tools for mainstreaming disaster risk reduction: Guidance Notes for Development Organisations.* Geneva: ProVention Consortium. 184 p.

Benson, C. and E.J. Clay. 2004. *Understanding the economic and financial impacts of natural disasters*. Washington DC: World Bank. Disaster Risk Management Series No. 4. 134 p.

Bettencourt, S., R. Croad, P. Freeman, J. Hay, R. Jones, P. King, P. Lal, A. Mearns, G. Miller, I. Pswarayl-RiddiHough, A. Simpson, N. Teuatabo, U. Trotz and M. van Aalst. 2006. *Not if but when: adapting to natural hazards in the Pacific Islands Region. A* Policy Note. East Asia and Pacific region: Pacific Islands Country Management Unit, The World Bank, 42 p.

Brown, O. 2007. *Climate change and forced migration: observations, projections and implications*. Background Paper for Human Development Report 2007/17, UNDP.

Brown, O. 2008. *Migration and climate change*. IOM Migration Research Series No.31. Geneva: International Organisation for Migration.

Brundtland, G.H. 2007. *UN special envoy for climate change. Gro Harlem Brundtland addresses the 15*th *Session of the UN Commission on sustainable development*. Speech at the UN Commission on Sustainable Development. 9 May 2007.

Burton, I and M.K. van Aalst. 1999. *Come hell or high water: integrating climate change vulnerability and adaptation into bank work*. World Bank Environment Department Paper number 72. Washington DC: The World Bank.

Burton, I. and M.K. van Aalst. 2004. *Look before you leap: a risk management approach for integrating climate change adaptation into World Bank operations.* World Bank Environment Department Paper number 100. Washington DC: The World Bank.

Cai, X. 2006. *Water stress, water transfer and social equity in Northern China: implications for policy reforms*. Issue note for the Human Development Report 2006: Beyond Scarcity: Power, Poverty and the Global Water Crisis. Palgrave Macmillian, New York.

California Department of Water Resources. 2006. *Progress on incorporating climate change into planning and management of California's water resources*. Technical Memorandum Report. San Francisco, July 2006.

Cannon, T. Twigg, J., and J. Rowall. 2003. *Social vulnerability, sustainable livelihoods and disasters.* Report to DFID, Conflict and Humanitarian Assistance Department (CHAD) and Sustainable Livelihoods Office London: Department of International Development.

Carius, A., D. Tanzler and A. Maas. 2008. *Climate change and security: challenges for German development cooperation*. Deutsche Gesellschaft fur Technische Zusammenarbeit (GTZ) GmbH: Eschborn.

Castles, S. 2002. *Environmental change and forced migration: making sense of the debate*. New Issues in Refugee Research Working Paper No. 70. UNHCR: Geneva.

Chafe, Z. 2007. *Reducing natural disaster risk in cities*. In Linda Stark, (ed.) State of the World 2007: Our urban future. 24th edition. A Worldwatch Institute Report on Progress Toward a Sustainable Society. Earthscan, London.

Chhibber, A. and R. Laajaj. 2006. *Disasters, climate change, and economic development in sub-Saharan Africa: lessons and directions*. Independent Evaluation Group, World Bank, Washington, DC.

Christian Aid. 2005. *Don't be scared, be prepared: How disaster preparedness can save lives and money. Recommendations to help advance the disaster preparedness agenda*. London: Christian Aid. 16 p.

Christian Aid. 2006. *The climate of poverty: facts, fears and hope*. London: Christian Aid. 48 p.

Christian Aid. 2007. *Human tide: the real migration crisis*. London: Christian Aid. 28 p.

Christian Aid. 2007. *The human face of climate change*. London: Christian Aid. 21 p.

Christoplos, I. 2008. *Incentives and constraints to climate change adaption and disaster risk reduction – a local perspective*. Report for the Commission on Climate Change and Development. 36 p.

Clay, E., L. Bohn, E. Blanco de Armas, S. Kabambe, and H. Tchale. 2003. *Malawi and Southern Africa: Climate variability and economic performance*. Disaster Management Facility. Disaster Risk Management Working Paper Series No. 7. The World Bank, Hazard Management Unit Washington DC.

Center for Naval Analyses (CNA) Corporation. 2007. *National security and the threat of climate change*. Center for Naval Analyses, Alexandria, Virginia. Available at:
http://securityandclimate.cna.org/report/National%20Security%20and%20the%20Threat%20of%20Climate%20Change.pdf. (Accessed 17 August 2008)

Cohen, M.J. 2007. *Food security: Vulnerability despite abundance*. Coping With Crisis Working Paper Series, International Peace Academy, New York.

Concheso, T.G. 2003. *Protecting new health facilities from natural disasters; guidelines for the promotion of disaster mitigation*. Pan American Health Organization/ World Health Organization. 53 p.

Dasgupta, S., B. Laplante, C. Meisner. D. Wheeler and J. Yan. 2007. *The impact of sea level rise on developing countries: A comparative analysis*. Policy Research Working Paper 4136. World Bank, Washington, DC.

Davis, I., B. Haghebaert, and D. Peppiatt. 2004. *Social vulnerability & capacity analysis (VCA)*. Discussion paper prepared for the ProVention Consortium Workshop at IFRC Geneva on May 25–26, 2004. Geneva: ProVention Consortium. 40 p.

Davies, I and Z. Murshed. 2006. *Critical guidelines: Community-based disaster risk management.* Bangkok: Asian Disaster Preparedness Center (ADPC). 74 p.

Davies, M., J. Leavy, T. Mitchell and T. Tanner. 2008. *Social protection and climate change adaptation*. Briefing note for expert group to the Commision on Climate Change and Development, Ministry of Foreign Affairs, Sweden. Institute for Development Studies (IDS).

de Janvry, A., E. Sadoulet, P. Solomon and R.V. Vakis. 2006. *Uninsured Risk and asset protection: Can conditional transfer programs serve as safety nets?* Social Protection Discussion Paper No. 0604. World Bank, Washington, DC.

Department for International Development (DFID). 2004. *Disaster risk reduction: a development concern.* London: Department for International Development. 74 p.

Department for International Development (DFID). 2004. *Adaptation to climate change: Can insurance reduce the vulnerability of the poor?* DFID Key Sheet no. 8. London: Department for International Development. 8 p.

Department for International Development (DFID). 2004. *Adaptation to climate change: making development disaster proof.* DFID Key Sheet no. 6. London: Department for International Development. 8 p.

Department for International Development (DFID). 2005. *Disaster risk reduction: a development concern. Integrating disaster risk reduction into development policy and practice*. London: Department for International Development. 8 p.

Department for International Development (DFID). 2005. *Natural disasters and disaster risk reduction measures: A desk review of costs and benefits*. London: Department for International Development. 45 p.

Department for International Development (DFID). 2006. *Reducing the risk of disasters – helping to achieve sustainable poverty reduction in a vulnerable world.* A DFID policy paper. 36 p.

Department for International Development (DFID). 2004. *Adaptation to climate change: Can insurance reduce vulnerability of the poor?* Key Sheet No. 8, London.

Department for International Development(DFID). 2006. *Natural disaster and disaster risk reduction measures – A desk review of costs and benefits*. Environmental Resources Management, DFID, London.

Department for International Development (DFID). 2006. Working internationally to tackle climate change. In *Eliminating world poverty: Making governance work for the poor.* A White Paper on International Development, DFID: London. http://www.dfid.gov.uk/pubs/files/whitepaper2006/wp2006section4.pdf (accessed 8 July 2008)

Desai, B. and S. Moss. 2007. *Overexposed: Building disaster-resilient communities in a changing climate*. London: Christian Aid.

Dilley, M., R.S. Chen, U. Deichmann, A.L. Lerner-Lam, and M. Arnold, with J. Agwe, P. Buys, O. Kjekstad, B. Lyon and G. Yetman. 2005. Natural disaster hotspots: a global risk analysis. Washington DC: *Disaster risk management working paper series No. 5.* The World Bank, Hazard Management Unit. 148 p.

Dinar, A. 2007. 'Climate change: The final blow for agriculture in Africa?. *Research Brief*. The World Bank: http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/EXTPROGRAMS/EXTIE/0,,contentMDK:21425514~pagePK:64168182~piPK:64168060~theSitePK:475520,00.html (accessed 17 September 2007).

Education Development Center (EDC); Thailand Ministry of Health; United States Agency for International Development (USAID). 2007. *Young people's forum: Disasters and the aftermath: building young people's life skills for health and education: country consultations summary report. Training young people to deal with future disasters.* UNICEF East Asia and Pacific Regional Office. 53 p.

Ehrhart, C. and M. Twena. 2006. *Climate change and poverty in Tanzania*. Background report for the CARE International Poverty-Climate Change Initiative. 33 p.

Ehrhart, C., A. Thow, M. de Blois and A. Warhurst. 2008. *Humanitarian implications of climate change. Mapping emerging trends and risk hotspots*. Care and Maplecroft. 36 p.

Emergency Management Australia. 1996. *Disaster Recovery*. Australian Emergency Manual Series.

Environmental Resource Management (ERM). 2002. *Predicted impact of global climate change on poverty and the sustainable achievement of the Millennium Development Goals*. Report prepared for DFID by Environmental Resources Management. Reference 8409. London.

Epstein, P.R. and E. Mills (eds.). 2005. *Climate change futures: health, ecological and economic dimensions*. Center for Health and the Global Environment, Harvard Medical School. 142 p. (report to the UNEP/Swiss Re).

European Environment Agency (EEA). 2007. *Climate change and water adaptation issues*. EEA Technical Report No. 2/2007. Office for Official Publications of the European Communities, Luxembourg.

http://reports.eea.europa.eu/technical_report_2007_2/en/eea_technical_report_2_2007.pdf. (Accessed 8 July 2007).

Food and Agriculture Organization of the United Nations(FAO) 2002. *The state of food insecurity in the World 2002*. FAO, Rome.

Feenstra, J. et al (eds). 1998. *Handbook on methods for climate change impact assessment and adaptation strategies* (Version 2.0). Nairobi: United Nations Environment Programme and Amsterdam: Institute for Environmental Studies, Vrije Universiteit.

Few, R., H. Osbahr, L.M. Bouwer, D. Viner and F. Sperling. 2006. *Linking climate change adaptation and disaster management for sustainable poverty reduction*. Synthesis Report for Vulnerability and Adaptation Resource Group (VARG).

Frankel-Reed, J. 2006. *Adaptation through development: a review of bilateral development agency programmes, Methods and Projects*. Global Environment Fund (GEF), New York.

Freeman, P. K. and K. Warner. 2001. *Vulnerability of infrastructure to climate variability: how does this affect infrastructure lending policies*. Report commissioned by the Disaster Management Facility of The World Bank and the ProVention Consortium. 42 p.

Freeman, P.K., L. A. Martin, R. Mechler, K. Warner and P. Hausmann. 2002. *Catastrophes and development, integrating natural catastrophes into development planning*. Washington DC: Disaster Risk Management Paper Series No. 4. World Bank, Hazard Management Unit. 73 p.

Friends of the Earth Middle East. 2007. *Climate change may further erode political stability in the Middle East*. http://www.foeme.org/press.php?ind=49. Accessed 23 August 2008.

German Advisory Council on Global Change (WGBU). 2007. *World in transition: Climate change as a security risk. Summary for policy makers*. Berlin, WBGU. http://www.wbgu.de/wbgu_jg2007_engl.html. Accessed 23 August 2008.

German Federal Ministry for Economic Cooperation and Development. 2004. *Disaster risk management: contributions by German development cooperation. German views on disaster risk management for sustainable development.* Bonn: Bundesministerium fur wirtschaftliche Zusammenarbeit und Entwicklung. 27 p.

Gigli, S and S. Agrawala. 2007. *Stocktaking of progress on integrating adaptation to climate change into development cooperation activities*. Paris: Organisation for Economic Co-operation and Development (OECD). 85 p.

Gleditsch, N., R. Nordas and I. Salehyan. 2007. *Climate change and conflict: The migration link*. International Peace Academy Coping With Crisis Working Paper: International peace Academy: New York.

Haghebaert, B. 2008. Working with vulnerable communities to assess and reduce disaster risk. *Humanitarian Exchange*, Number 38, pp. 15-18.

Halsnoes, K. and S.L. Troerup. 2006. *Climate and development action programme, Experiences from the Danish*. Danish Climate and Development Programme.

Hay, J. E., N. Mimura, J. Campbell, S. Fifita, K. Koshy, R.F. McLean, T. Nakalevu, P. Nunn,
and N. de Wet. 2003. *Climate variability and change and sea-level rise in the Pacific Islands region: A resource book for policy and decision makers, educators and other stakeholders*. South Pacific Regional Environment Programme, Apia, Samoa, 108 p.

Heijmans, A. and L. Victoria. 2001. *Citizenry-based & development-oriented disaster response: Experiences and practices in disaster management of the citizens' disaster response network in the Philippines*. Quezon City: Center for Disaster Preparedness.

House of Commons International Development Committee. 2006. *Humanitarian response to natural disasters*. Seventh Report of Session 2005-06, London.

Humanitarian Practice Network (HPN). 2007. Disaster risk reduction. *Humanitarian Exchange* Number 39, June 2007, Overseas Development Institute, London. 36 p.

Inter-agency Working Group on Emergency Capacity. 2007. *Emergency capacity building pilot projects: promising practices for risk reduction.* Inter-agency Working Group on Emergency Capacity. 29 p.

International Council on Human Rights Policy (ICHRP). 2008. Climate change and human rights: a rough guide versoix, Switzerland.

International Council for Science (ICSU). 2008. A Science Plan for Integrated Research on
Disaster Risk: Addressing the challenge of natural and human-induced environmental hazards.66 p.

International Federation of Red Cross and Red Crescent Societies (IFRC). 1999. *Vulnerability and capacity assessment.* Geneva: IFRC.

International Federation of Red Cross and Red Crescent Societies (IFRC). 1999. *Vulnerability and capacity assessment: an international federation guide*. Geneva: IFRC.

International Federation of Red Cross and Red Crescent Societies (IFRC). 2002. *World disasters report 2002: Focus on reducing risk.* Geneva: IFRC.

International Federation of Red Cross and Red Crescent Societies (IFRC). 2003. *Preparedness for climate change. Assessing the future impact of climate change and the implications for humanitarian response and preparedness*. Geneva: IFRC. 15 p.

International Federation of Red Cross and Red Crescent Societies (IFRC). 2005. *2nd international work conference on climate change and disaster risk reduction*. The Hague, Netherlands, 21-24 June 2005. 30 p.

International Federation of the Red Cross and Red Crescent Societies (IFRC). 2005. *World disasters report 2005: Focus on information in disasters*. Geneva: IFRC.

International Federation of the Red Cross and Red Crescent Societies (IFRC). 2006. *World disasters report 2006: Focus on neglected crises*. Geneva: IFRC.

International Federation of Red Cross and Red Crescent Societies (IFRC). 2006. *What is VCA? A guide to vulnerability and capacity assessment*. Geneva: IFRC. 51 p.

International Federation of Red Cross and Red Crescent Societies (FRC). 2006. *How to do a VCA: A practical step-by-step guide for Red Cross Red Crescent staff and volunteers*. Geneva: IFRC.

International Federation of Red Cross and Red Crescent Societies (IFRC). 2006. *VCA toolbox and tool reference sheets*. Geneva: IFRC.

International Federation of Red Cross and Red Crescent Societies (IFRC). 2006. *Vulnerability and capacity assessment: Lessons learned.* Geneva: IFRC.

International Federation of Red Cross and Red Crescent Societies (IFRC). 2007. *Climate guide. How should humanitarian organisations integrate increased climate risk into their work?* IFRC Centre on Climate Change and Disaster Preparedness. 73 p.

International Institute for Disaster Risk Management (IDRM). 2002. *Cambodian Red Cross Community-Based Disaster Preparedness Program (CRC-CBDP) Evaluation report*. Submitted to the International Federation of Red Cross and Red Crescent Societies and the Cambodian Red Cross. Makati City: IDRM.

International Training Centre of the ILO. 2006. Disaster risk reduction: a call to action. Prepared with the international recovery platform (IRP) and UNISDR. Issue No.3.

Kelkar, U and S. Bhadwal. 2007. *South Asian regional study on climate change impacts and adaptation: implications for human development.* Background Paper for Human Development Report 2007/27, UNDP.

Keen, M., M. Mani, and P.K. Freeman. 2003. *Dealing with increased risk of natural disasters: challenges and options.* International Monetary Fund Working Papers no. 03/197. 38 p.

Kniveton, D., K. Schmidt-Verkerk, C. Smith, and R. Black. 2008. *Climate change and migration: improving methodologies to estimate flows*. IOM Migration Research Series No.33. Geneva: International Organisation for Migration.

Kolmannskog, V. 2008. *Future floods of refugees: A comment on climate change, conflict and forced migration*. Report by the Norwegian Refugee Council, Oslo, Norway.

Krauskopf, R.B. and R.R. Saavedra. 2004. *Guidelines for vulnerability reduction in the design of new health facilities.* Washington DC: Pan American Health Organisation/ World Bank. 106 p.

Kreimer, A., M. Arnold, A. Carlin. (eds). 2003. *Building safer cities: the future of disaster risk*. Washington DC: World Bank. Disaster Management Facility.

La Trobe, S. and I. Davis. 2005. *Mainstreaming disaster risk reduction: a tool for development organisations. How can organisations incorporate disaster risk reduction into relief and development planning and programming?* Middlesex: Tearfund. 20 p.

Mano, R. B. Isaacson, P. Dardel. 2003. *Identifying policy determinants of food security response and recovery in the SADC region: the case of the 2002 food emergency*. FANRPAN policy paper.

Marsland, N. 2004: *Development of food security and vulnerability information systems in Southern Africa: The Experience of Save the Children UK*. Save the Children, UK.

Maskrey, A., G. Buescher, P. Peduzzi and C. Schaerpf. 2007. *Disaster risk reduction: 2007 global review*. Consultation Edition. Prepared for the Global Platform for Disaster Risk Reduction First Session, Geneva, Switzerland, 5–7 June 2007. Geneva.

Maxwell, D.,2006. *Global trends in food aid*. Khartoum, Food Aid Forum, 6-8 June 2006, World Food Programme.

McGray, H., Anne Hammill, R. Bradley, with E.L. Schipper, and J.-E. Parry. 2007. *Weathering the storm. Options for framing adaptation and development*. Washington DC: World Resources Institute.

McKenzie, E.B.P. and A. Kaloumaira. 2005. *Economic impact of natural disasters on development in the Pacific.* Volume 1: Research Report. Australian Agency for International Development (AusAID). 92 p.

Mechler, R. 2005. *Cost-benefit analysis of natural disaster risk management in Developing and Emerging Countries*. Long Study. Interim report for GTZ.

Mechler, R., J. Linnerooth-Bayer, D. Peppiatt. 2006. *Disaster insurance for the poor? A review of microinsurance for natural disaster risks in developing countries. How to keep premiums low yet ensure financial sustainability of microinsurance providers? Geneva:* ProVention Consortium. 32 p.

Mercy Corps. 2005. Strengthening civil society in the midst of natural disaster. The Bridge. Mercy Corps. *Civil society newsletter* Vol. V Second Quarter 2005.

Miamidian, E. M. Arnold, K. Burritt, M. Jacquand. 2006. *Surviving disasters and supporting recovery: a guidebook for microfinance institutions. Tackling vulnerability to disasters through microfinance.* Washington DC: World Bank, Hazard Management Unit. 51 p.

Mills, E., R. J. Roth, Jr., and E. Lecomte. 2005. *Availability and affordability of insurance under climate change: A growing challenge for the U.S.* Boston: Ceres, Inc.

Mitchell, T and T. Tanner T. 2006. *Adapting to climate change: challenges and opportunities for the development community*. TEARFUND climate change briefing paper, Institute of Development Studies (IDS). 40 p.

Mitchell, T. and T. Tanner. 2006. *Overcoming the barriers: Mainstreaming climate change adaptation in developing countries*. TEARFUND climate change briefing paper, Institute of Development Studies (IDS). 28 p.

Mitchell, T., T. Tanner and K. Lussier. 2007. *We know what we need: South Asian women speak out on climate change adaptation*. Johannesburg: Action Aid International and Sussex: Institute of Development Institute.

Moench, M. and A. Dixit. 2004. *Adaptive capacity and livelihood resilience: adaptive strategies for responding to floods and droughts in South Asia. Identifying factors which enable South Asian communities to adapt to floods, droughts and climatic variability.* Colorado: Institute for Social And Environmental Transition. 229 p.

Moench, M. and A. Dixit (eds). 2007. *Working with winds of change. Towards strategies for responding to the risks associated with climate change and other hazards (2nd ed)*. ProVention Consortium, Institute for Social and Environmental Transition-International and Institute for Social and Environmental Transition-Nepal.

Naik, A., E. Stigter, and F. Laczko. 2007. Migration, development and natural disasters: insights from the Indian Ocean tsunami. *IOM Migration Research Series No.30.* Geneva: International Organisation for Migration.

O'Brien, K. (ed). 2002. *Developing strategies for climate change: The UNEP country studies on climate change impacts and adaptation assessment.* CICERO Report 2000:2. Oslo: CICERO. Report for United Nations Environment Program (UNEP).

O'Brien, K.L. and R.M. Leichenko. 2007. Human Security, vulnerability, and sustainable adaptation. Background Paper commissioned for the Human Development Report 2007/2008: Fighting Climate Change: Human Solidarity in a Divided World. New York: UNDP.

Organisation for Economic Co-operation and Development (OECD). 2006. *Declaration on integrating climate change adaptation into development cooperation*. Paris.

Organisation for Economic Co-operation and Development (OECD). 2006. *Japan floods. OECD Studies in Risk Management*. Paris.

Organisation for Economic Co-operation and Development (OECD). 2007. *Climate change and Africa*. Paper prepared by the AFP Support Unit and NEPAD Secretariat for the 8th Meeting of the Africa Partnership Forum. 22–23 May, Berlin.

Organisation for Economic Co-operation and Development (OECD). 2008. *Economic aspects of adaptation to climate change: an assessment of costs, benefits, and policy instruments*. Working Party on Global and Structural Policies. ENV/EPOC/GSP(2008)7. Paris: OECD.

Overseas Development Institute (ODI). 2005. *Aftershocks: natural disaster risk and economic development policy*. Briefing paper.

Oxfam International, 2007. *From weather alert to climate alarm.* Oxfam Briefing paper.

Oxfam International, 2007. *Sink or swim: why disaster risk reduction is central to surviving floods in South Asia*. Oxfam Briefing Note.

Oxfam International. 2007. *Adapting to climate change: What's needed in poor countries and who should pay*. Oxfam Briefing Paper 104. 47 p.

Oxfam International. 2008. *Rethinking disasters: why death and destruction is not nature's fault but human failure*. Oxfam Report. 43 p.

Palakudiyil, T. and M. Todd. 2003. *Facing up to the storm, how local communities can cope with disasters: lessons from Orissa and Gujarat*. London: Christian Aid, London.

Parker, D. and P. Budgen. 1999. *The tropical cyclone warning dissemination system in Mauritius*. UK National Coordination Commitee for the International Decade for Natural Disaster Reduction Forecasts and Warnings. London: Thomas Telford.

Pelling, M., A. Maskrey, P. Ruiz and L. Hall. 2004. *A global report: reducing disaster risk: a challenge for development*. New York: United Nations Development Programme, Bureau for Crisis Prevention and Recovery.

Pelling, M. and A. Holloway. 2006. *Legislation for mainstreaming disaster risk reduction. How did South Africa successfully develop DRR legislation.* Middlesex: Tearfund. 36 p.

Pelling, M. 2006. *ProVention Forum 2006 – Incentives for reducing risk.* Bangkok: ProVention/IFRC. 26 p.

Piguet, E. 2008. *Climate change and forced migration*. Research Paper No 153. Evaluation and Policy Analysis Unit, UNHCR. 15 p.

Plan International. 2005. *Children and the tsunami: Engaging with children in disaster response, recovery and risk reduction, learning from children's participation in the Tsunami response*. Bangkok: Plan International, 29 p.

Practical Action. 2006. *Shouldering the burden. Adapting to climate change in Kenya*. http://practicalaction.org/?id=climatechange_panniers. Accessed 23 August 2007.

ProVention Consortium/ Swiss Federal Institute for Snow and Avalanche Research Davos. 2004. *Opportunity: the potential of insurance for disaster risk management in Developing Countries.* Conference proceedings and workshop report. Geneva: IFRC/ ProVention Consortium. 28 p.

ProVention Consortium/International Institute for Applied Systems Analysis (IIASA). 2005. *Invest to prevent disaster. The potential benefits and limitations of microinsurance as a risk transfer mechanism for developing coun-*

tries. Viewpoint for International Day for Disaster Reduction, 12 October, 2005. Geneva: ProVention Consortium/International Institute for Applied Systems Analysis (IIASA).

ProVention Consortium/International Institute for Applied Systems Analysis (IIASA). 2006. *Disaster insurance for the poor? A review of microinsurance for natural disaster risks in Developing countries*. Geenva: ProVention Consortium/International Institute for Applied Systems Analysis (IIASA).

ProVention Consortium. 2007. *ProVention consortium forum 2007, making disaster risk reduction work*. Dar Es Salaam, February, 13-15, 2007. Geneva: ProVention Consortium.

ProVention Consortium. 2007. *Community risk assessment and climate adaptation tools*. Geneva: ProVention Consortium.

ProVention Consortium. 2007. *Strengthening the social analysis component in rapid impact and vulnerability assessment.* Workshop Report. Panama, 29-31 January 2007. 24 p.

ProVention Consortium & Active Learning Network for Accountability and Performance in Humanitarian Action (ALNAP). 2007. *Slow onset disasters: drought and food and livelihoods security, Learning from previous relief and recovery responses*.

ProVention Consortium. 2008. *Flood disasters. Learning from previous relief and recovery operations*. Geneva: ProVention Consortium. 16 p.

ProVention Consortium. 2008. *From grassroots to global: People centered disaster risk reduction.* Panama, 8-10, April 2007.

ProVention Consortium. 2008. *Strengthening community resilience in the Caribbean region.* Workshop on Climate Change Adaptation, Development and Disaster Risk Reduction. Port of Spain, 19-20 February 2008.

Pusch, C. 2004. *Preventable losses: Saving lives and property through hazard risk management – A comprehensive risk management framework for Europe and Central Asia*. Disaster Risk Management Paper Series No. 9. Washington DC: World Bank, Hazard Management Unit. 113 p.

Rahman, A.A., M. Alam, S. Shafiqul Alam, Md. R. Uzzaman, M. Rashid, and G. Rabbani. 2007. *Risks, vulnerability and adaptation in Bangladesh*. Background Paper for UNDP Human Development Report 2007/13.

Raleigh, C., L. Jordan and I. Salehyan. 2008. *Assessing the impact of climate change on migration and conflict*. Paper prepared for the World Bank Seminar on Exploring the Social Dimensions of Climate Change. March 2008.

Ramamasy, S. and S. Bass. 2007. *Climate Variability and change: adaptation to drought in Bangladesh, a resource book and training guide*. Pathumthani: Asian Disaster and Preparedeness Center (ADPC) and Rome: UN Food and Agricultural Organisation. 66 p.

Raworth, K. 2007. *Adapting to climate change. What's needed in poor countries and who should pay*. Oxfam Briefing Paper No.104. Oxfam International, Oxford.

Reliefweb. 2007. *Information on complex emergencies and natural disasters*. [http://www.reliefweb.int/]. September 2007.

Savage, K and P. Harvey. 2007. *Remittances during crises: implications for humanitarian response*. Humanitarian Policy Group, Briefing paper 26.

Save the Children. 2007. *Legacy of disasters: the impact of climate change on children. Estimating the impact of climate change disasters on children.* London: Save the Children Fund, London. 16 p.

Save the Children. 2008. *In the face of disaster. Children and climate change*. London: Save the Children Fund. 26 p.

Schaar, J. 2008. *Overview of adaptation mainstreaming initiatives*. Commission on Climate Change and Development.

Schipper, L. 2008. *Two roads become one? Exploring the linkages between climate change adaptation and disaster risk reduction*. Draft Background paper prepared for the Harbin Alliance. 15 p.

Schubert, R. H. J. Schellnhuber, N. Buchmann, A. Epiney, R. Grießhammer, M. Kulessa, D. Messner, S. Rahmstorf, and J. Schmid. 2007. *Climate change as a security risk*. German Advisory Council on Global Change (WBGU), Earthscan, UK. 256 p.

Shaw, R. S.V., R.K Prabhakar, H. Nguyen, and S. Price-Thomas. 2007. *Drought-management considerations for climate change adaptation: focus on the Mekong region. How can communities in VietNam adapt to recurring droughts?* Viet Nam: Oxfam. 56 p.

Simms, A., J. Magrath, and H. Reid. 2004. *Up in Smoke? Threats from, and responses to, the impact of global warming on human development*. Published by New economic funding (Nef).

Smith, D and J. Vivekananda. 2007. *A climate of conflict: the links between climate change, peace and war*. International Alert.

South Pacific Disaster Reduction Programme (SPDRP). 2002. *Gender, households, community and disaster management: case studies from the Pacific Islands*. SOPAC Technical Report 282.

Sperling, F. (ed.) 2003. *Poverty and climate change: Reducing the vulnerability of the poor through adaptation*. Inter-agency report by the African Development Bank (AfDB), Asian Development Bank (ADB), Department for International Development (DFID, UK), Federal Ministry for Economic Cooperation and Development (BMZ, Germany), Directorate-General for Development European Commission (EC), Ministry of Foreign Affairs – Development Cooperation (DGIS, The Netherlands), Organisation for Economic Cooperation and Development (OECD), United Nations Development Programme (UNDP), United Nations Environment Program (UNEP), and the World Bank.

Sperling, F. and F. Szekely. 2005. *Disaster risk management in a changing climate.* Discussion Paper prepared for the World Conference on Disaster Reduction on behalf of the Vulnerability and Adaptation Resource Group (VARG). Reprint with Addendum on Conference outcomes. Washington DC. 45 p.

Stokke, K. 2007. *Humanitarian response to natural disasters: a synthesis of evaluation findings.* Synthesis Report 1/2007. Norwegian Agency for Development Cooperation (Norad).

TEARFUND. 2003. *Natural disaster risk reduction: the policy and practice of selected institutional donors*. TEARFUND.

TEARFUND. 2005. *One disaster too many: why thousands are dying needlessly each year in preventable disasters*. A TEARFUND briefing for the World Conference on Disaster Reduction, 18-22 January 2005, Kobe, Japan.

TEARFUND. 2007. *Darfur: Relief in a vulnerable environment.* TEARFUND.

TEARFUND. 2007. *Prepare to live: strengthening the resilience of communities to manage food insecurity in the Sahel region.* TEARFUND.

TEARFUND. 2007. *Why advocate for disaster risk reduction?* TEARFUND.

Telford, J., M. Arnold, and A. Harth, with ASONOG. 2004. *Learning lessons from disasters recovery: the case of Honduras*. Disaster Risk Management Working Papers Series No. 8. Washington CD: World Bank, Hazard Management Unit. 81 p.

The Oslo Policy Forum. 2008. *Changing the way we develop: dealing with disasters and climate change.* Workshop, 28-29 February 2008.

Thompson, M. and I. Gaviria. 2004. *Cuba, weathering the storm: lessons in risk reduction from Cuba*. Oxfam America, Boston.

Thywissen, K. 2006. *Components of risk: a comparative glossary*. United Nations University Institute for Environment and Human Security.

Trench, P., J. Rowley, M. Diarra, F. Sano, and B. Keita. 2007. *Beyond any drought: root causes of chronic vulnerability in the Sahel*. The Sahel Working Group. CARE international. 23 p.

Twigg, J. 2004. *Disaster risk reduction, mitigation and preparedness in development and emergency programming.* Good Practice Review. Humanitarian Practice Network (HPN). London: Overseas Development Institute (ODI).

Ulsrud, K., L. Sygna, and Karen L. O'Brien. 2008. *More than rain: Identifying sustainable pathways for climate adaptation and poverty reduction*. Report prepared by GECHS (Global Environmental Change and Human Security Project) for the Development Fund, Norway.

UN. 2008. *Humanitarian Update vol.22. 28 May—4June 2008*. Office of the United Nations Humanitarian Coordinator in Kenya.

UNCRD. 2003. *Sustainability in grass roots initiatives: focus on community based disaster management Japan.* UN Centre for Regional Development (UNCRD). UN.

UNCHS. 2003. *Human security now*. New York: UN Commission on Human Security.

UNCHS. 2006. *Human security for all. Integrated responses to protect and empower people and communities: a look at nine promising efforts*. New York: Human Security Unit, Office for the Coordination of Humanitarian Affairs, UN.

UNDP. 2002. *Capacity building for stage II adaptation to climate change in Central America, Mexico and Cuba. GEF Project Brief*. New York: UNDP.

UNDP. 2002. *A climate risk management approach to disaster reduction and adaptation to climate change.* Havana, June 17.-19. 2002. 91 p.

UNDP. 2004. *Reducing disaster risk: a challenge for development*. Geneva: UNDP.

UNDP. 2005. *Adaptation policy frameworks for climate change. Developing Strategies, Policies and Measures.* Cambridge and New York: Cambridge University Press.

UNDP – Dryland Development Centre/Bureau for Conflict Prevention and Recovery and UN International Strategy for Disaster Reduction (UNISDR). 2005. *Drought risk and development policy*. Discussion paper prepared for the UNDP-DDC/BCPR and UNISDR Expert Workshop Drought Risk and Development Policy, 31 January–2 February, 2005, Nairobi.

UNDP. 2007. *Fighting climate change: Human solidarity in a divided world*. Human Development Report 2007/2008, New York, UNDP, 2007.

UNDP/Financial Planning Association (FPA). 2006. *United Nations Population Fund: Integrating the programme of action of the international conference on population and development into emergency preparedness, humanitarian response, and transition and recovery programmes: a strategy to build commitment and capacity.* Report 14, 2006. New York: UNDP.

UNEP Finance Initiative. 2006. *Adaptation and vulnerability to climate change: The role of the finance sector*. CEO Briefing, November 2006.

UNESCO. 2008. *Food, commodity crises caught world napping, say speakers taking part in commission on sustainable development dialogue*. UN.

UNFCCC. 2004. *Application of methods and tools for assessing impacts and vulnerability, and developing adaptation responses.* Background paper by the UNFCCC Secretariat. FCCC/SBSTA/2004/INF.13. Bonn: UNFCCC.

UNFCCC. 2007. *Vulnerability and adaptation to climate change in small island developing states.* Background paper for meeting on adaptation for small developing states. UNFCC.

UNFCCC. 2007. *Climate Change: impacts, vulnerabilities and adaptation in developing countries. Effectively dealing with climate change in developing countries.* United Nations Framework Convention on Climate Change. 68p.

UNFCCC. 2007. Investment and financial flows to address climate change.

UNFCCC: Bonn.

UN General Assembly. 2007. *International cooperation on humanitarian assistance in the field of natural disasters, from relief to development*. Report of the Secretary-General. No. A/62/323. New York.

UN General Assembly 2008. *Strengthening of the coordination of emergency humanitarian assistance of the United Nations*. New York.

UN Intergovernmental Panel on Climate Change (IPCC). 2002. *IPCC Workshop on changes in extreme weather and climate events*. 11.-13. June 2002. Workshop Report 2002. Beijing, China.

UN Intergovernmental Panel on Climate Change (IPCC). 2007. *Climate change 2007*: *The physical science basis.* Report of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. New York: Cambridge University Press.

UN Intergovernmental Panel on Climate Change (IPCC). 2007. *Climate change 2007: Impacts, adaptation and vulnerability.* Report of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. New York: Cambridge University Press.

UN Intergovernmental Panel on Climate Change (IPCC). 2007. *Climate change 2007: Mitigation of climate change*. Report of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. New York: Cambridge University Press.

UN Intergovernmental Panel on Climate Change (IPCC). 2007. *Up in smoke? Asia and the Pacific: the threat from climate change to human development and the environment. Will global warming send Asia and the Pacific 'up in smoke'?* IPCC. 96 p.

UN International Strategy for Disaster Reduction (UNISDR). 2002. *Disaster reduction and sustainable development: understanding the links between vulnerability and risk related to development and environ*ment. Background document for the World Summit on Sustainable Development. No 5.

UN International Strategy for Disaster Reduction (UNISDR). 2004. *Living with risk: A global view of disaster reduction initiatives geneva: UN International Strategy for Disaster Reduction.* Geneva.

UN International Strategy for Disaster Reduction (UNISDR). 2004. *Terms of reference. IATF Working Group on Climate Change and Disaster Risk Reduction.* Geneva: UNISDR.

UN International Strategy for Disaster Reduction (UNISDR). 2005. *Strategic directions for the ISDR system to assist the implementation of the Hyogo Framework for Action 2005-2015: Building the resilience of nations and communities to disasters*. Geneva: UNISDR.

UN International Strategy for Disaster Reduction (UNISDR). 2005. *Hyogo Framework for Action 2005-2015: Building the resilience of nations and communities to disaster*. Extract from the final report of the World Conference on Disaster Reduction. (http://www.unisdr.org/wcdr/intergover/official-doc/L-docs/Hyogo-framework-for-action-english.pdf).

UN International Strategy for Disaster Reduction (UNISDR) and World Bank Global Facility for Disaster Reduction and Recovery (GFDRR). 2006. *A partnership for mainstreaming*
disaster mitigation in poverty reduction strategies. Geneva and Washington, DC.

UN International Strategy for Disaster Reduction (UNISDR). 2007. *Disaster risk reduction: global review*. Report prepared for the First session of the Global Platform for Disaster Risk Reduction, Geneva, 5-7 June.

UN International Strategy for Disaster Reduction (UNISDR). 2007. *Towards a culture of prevention: disaster risk reduction begins at school – good practices and lessons learned. How can schools help promote disaster risk reduction?* United Nations International Strategy for Disaster Reduction. Geneva. 256 p.

UN International Strategy for Disaster Reduction (UNISDR). 2007. *Drought risk reduction framework and practices: Contributing to the implementation of the Hyogo Framework for Action*. Geneva.

UN International Strategy for Disaster Reduction (UNISDR). 2007. *Building disaster resilient communities. Good practices and lessons learned*. Geneva.

UN International Strategy for Disaster Reduction (UNISDR). 2007. *Words into action: A guide for implementing the Hyogo Framework*. Hyogo Framework for Action 2005–2015: Building the Resilience of Nations and Communities to Disasters. Geneva.

UN International Strategy for Disaster Reduction (UNISDR) and World Bank Global Facility for Disaster Reduction and Recovery (GFDRR). 2007. *Committed to reducing vulnerabilities to hazards by mainstreaming disaster reduction and recovery in development.* Progress Report 1. Geneva and Washington, DC.

UN International Strategy for Disaster Reduction (UNISDR). 2008. *Links between disaster risk reduction, development and climate change*. Report prepared for the Commission on Climate Change and Development, Sweden.

UN International Strategy for Disaster Reduction (UNISDR). 2008. *Towards national resilience: Good practices of national platforms for disaster risk reduction*, United Nations secretariat of the International Strategy for Disaster Reduction (UN/ISDR), Geneva, Switzerland, 72 p.

UNICEF. 2007. *Climate change and children*. United Nations Children's Fund. New York.

UN Office for the Coordination of Humanitarian Affairs (IRIN). 2005. *Disaster reduction and the human cost of disaster*. IRIN Web special.

UN Office for the Coordination of Humanitarian Affairs (IRIN). 2006. *Running dry: the humanitarian impact of the global water crisis.*

USAID. 2007: *Adapting to climate variability and change, a guidance manual for development planning*, USAID.

US Country Studies Program. 1996. *Vulnerability and adaptation to climate change. a synthesis of results from the US Country Studies Program.* Washington DC: US Country Studies Program.

US Government Accountability Office (GAO). 2007. *Climate change: financial risks to federal and private insurers in coming decades are potentially significant*. March 2007. GAO-07-285. Report to the Committee on Homeland Security and Government Affairs, US Senate. Washington, DC.

Vakis, R. 2006. *Complementing natural disasters management: The role of social protection*. Social Protection Discussion Paper No. 0543. World Bank, Washington, DC.

van Aalst, M. and I. Burton. 2002. *The last straw: integrating natural disaster mitigation with environmental management.* Washington DC: Disaster Risk Management Paper Series No. 5. World Bank, Hazard Management Unit. 68 p.

Venton, P., J. Faleiro, and S. La Trobe. 2007. *Turning practice into policy: linking good practice community-based disaster risk management with government policy and practice*. TEARFUND.

Venton, P and S. La Trobe. 2007. *Institutional donor progress with mainstreaming disaster risk reduction*. TEARFUND and UNISDR.

Venton, P. and S. La Trobe. 2008. *Linking climate change adaptation and disaster risk reduction*. TEARFUND.

Warhurst, A. 2006. *Disaster prevention: a role for business.* Maplecroft/ProVention Consortium. 24 p.

Wharton Risk Management and Decision Processes Center. 2008. *Managing large-scale risks in a new era of catastrophes*.

Wiles, P., K. Selvester, L. Fidalgo. 2005. *Learning lessons from disaster recovery: the case of Mozambique*. Disaster Risk Management Working Paper Series No. 12. Washington DC: World Bank, Hazard Management Unit. 99 p.

World Bank. 2000. *World development report 2000/1: Attacking Poverty.* Oxford: Oxford University Press.

World Bank. 2004. *Global symposium for hazard risk reduction, lessons learned from the applied research grants for disaster risk reduction programme.* World Bank/ ProVention Consortium. Washington D.C. 26-28 July 2004. 203 p.

World Bank. 2006. *An investment framework for clean energy and development:*
A progress report. DC2006-0012. Washington, DC.

World Bank. 2006. *Hazards of nature, risks to development: An IEG (Independent Evaluation Group) Evaluation of World Bank Assistance for Natural Disasters*. Washington, DC.

World Bank. 2006. *Overcoming drought: adaptation strategies for Andhra Pradesh*. Washington, DC.

World Bank. 2006. *Kiribati adaptation (Phase 2 implementation) project*. Project appraisal, document, Report Number 35969. Washington, DC: World Bank.

World Bank. 2007. *Disasters, climate change, and economic development in Sub-Saharan Africa*. Evaluation Brief 3. Washington DC: World Bank.

World Bank. 2007. *Natural disaster hotspots. Case studies*. Management Series No. *6.* Washington DC: The World Bank, Hazard Management Unit. 204 p.

World Bank. 2008. *Climate resilient cities: a primer on reducing vulnerabilities to climate change impacts and strengthening disaster risk management in East Asian cities*. World Bank Working Paper Nr. 44926. 176 p.

World Meteorological Organization (WMO) & World Climate Research Programme (WCRP). 2007: *Climate information for adaptation needs and development needs, implementing the Nairobi Work Programme on Impacts, vulnerability and adaptation to climate change through the World Meteorological Organization and National Meteorological and Hyrdological Services.* WMO – No. 1025.

World Health Organisation (WHO). 1999. *Community emergency preparedness: a manual for managers and policy-makers.* Geneva: WHO.

World Health Organization (WHO). 2002. *The world health report 2002*. WHO: Geneva.

World Health Organisation (WHO). 2003. *Climate change and human health - risks and responses*. Geneva: WHO.

World Health Organisation (WHO). 2008. *Protecting health from climate change – World Health Day 2008*. Geneva: WHO.

World Resources Institute (WRI), United Nations Environment Programme (UNEP) and World Bank in collaboration with United Nations Development Programme (UNDP). 2005. *World Resources 2005: The Wealth of the poor – Managing ecosystems to fight poverty*. World Resources Institute, Washington, DC.

World Wide Fund for Nature (WWF). 2002. *Managing floods in Europe: the answers already exist*. WWF Danube-Carpathian Programme and WWF Loving Waters Programme-Europe. http://assets.panda.org/downloads/managingfloodingbriefingpaper.pdf. Accessed August 2007.

Zambian Red Cross. 2003. *Vulnerability capacity assessment, Sinazongwe District*. Lusaka: Zambia Red Cross Society.