

TOPIC GUIDE

Climate Change Adaptation

Andrew McDevitt

Topic Guide on Climate Change Adaptation

Andrew McDevitt

About this guide

GSDRC Topic Guides provide clear, impartial overviews of current evidence and thinking in topic areas relating to governance, conflict and social development. They introduce key texts, and contain links to one-page summaries of these texts on gsdrc.org.

Climate change is now recognised as a mainstream development issue. Developing countries are expected to suffer most severely from the impacts of climate change, which threatens to exacerbate existing vulnerabilities and hinder progress in attaining the Millennium Development Goals. At the same time, those most vulnerable to climate change are also the least responsible for causing it, whilst the imperative to reduce global greenhouse gas emissions places greater pressure on developing countries to shift to low carbon development pathways.

This topic guide focuses on adaptation to climate change in developing countries from a governance and social development perspective. It explores how climate change is likely to impact on the poorest and most vulnerable and some of the response measures that might be adopted.

Although beyond the remit of this topic guide, an understanding of the relationship between adaptation, mitigation (reducing greenhouse gas emissions) and the broader sustainable development agenda is key to assessing the synergies and trade-offs between different policy options. A brief introduction to these issues is presented in the context of low carbon and climate resilient development.

The guide was written by Andrew McDevitt (GSDRC) in November 2010, in collaboration with Tom Mitchell (Overseas Development Institute), Blessings Chinsigwa (University of Malawi) and Mozarahul Alam (United Nations Environment Programme).

About the GSDRC

The Governance and Social Development Resource Centre (GSDRC) provides cutting-edge knowledge services on demand and online. It aims to help reduce poverty by informing policy and practice in relation to governance, conflict and social development. The GSDRC receives core funding from the UK Department for International Development (DFID) and from the Australian Agency for International Development (AusAID).

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Understanding climate change adaptation as a development issue

Terms and definitions

The Intergovernmental Panel on Climate Change (IPCC) defines adaptation to climate change as the set of: “initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects” (IPCC, 2007). For the purposes of this guide, the focus is on ‘planned’ adaptation – i.e. adaptation that results from formal, conscious, and collective decision-making processes – as opposed to ‘autonomous’ or ‘spontaneous’ adaptation.

The lexicon associated with climate change adaptation is large and inconsistently applied. Terms such as ‘adaptive capacity’, ‘vulnerability’, ‘sensitivity’ and ‘resilience’ are often used loosely and in some cases have different meanings depending on context (e.g. ecosystems science vs. social science). Even the use of the term ‘climate change’ differs between the IPCC, for whom it refers to any change in climate over time (IPCC, 2007), and the United Nations Framework Convention on Climate Change (UNFCCC), for whom it refers to changes that are attributable to human activity over and above natural climate variability (UNFCCC, 1992).

The following documents present a range of interpretations of concepts and terms identified in UN and national climate change reports as well as in the academic literature.

Levina, E. and Tirpak, D., 2006, ‘Adaptation to Climate Change: Key Terms’, OECD, Paris
<http://www.oecd.org/dataoecd/36/53/36736773.pdf>

Schoon, M., 2005, ‘A Short Historical Overview of the Concepts of Resilience, Vulnerability, and Adaptation’, Working Paper W05-4, Workshop in Political Theory and Policy Analysis, Indiana University
http://www.indiana.edu/~iupolsci/gradcv/schoon/historical_critique.pdf

UNFCCC, 1992, ‘Text of the United Nations Framework Convention on Climate Change’, United Nations Framework Convention on Climate Change, Bonn
<http://unfccc.int/resource/docs/convkp/conveng.pdf>

Where is a good place to start?

A common point of departure in debates around climate change and development is that those responsible for causing climate change have an obligation to rectify the problem (in terms of both leading on mitigation and supporting adaptation). A further point often advanced is that, given the atmosphere’s limited capacity to absorb greenhouse gases (GHGs), there should be some compensation for the diminishing environmental space left for developing countries to fuel their own development.

These considerations are generally reflected in the principles which underpin international climate negotiations, such as the acknowledgement of ‘common but differentiated responsibilities’ and reference to the special needs of developing countries. However, there remains much disagreement among developing and developed countries regarding the degree to which responsibility should be shared in practice, particularly in light of the rapid growth of GHG emissions from some industrialising countries in the global South.

Gardiner, S. , 2010, ‘Ethics and Climate Change: An Introduction’, WIREs Climate Change, vol. 1, no. 1
<http://www.gsdrc.org/go/display&type=Document&id=3938>

What are the ethics of climate change? This paper offers an overview of the emerging field of climate ethics. It argues that ethical analysis can contribute to five central concerns of climate policy: the treatment of scientific uncertainty, responsibility for past emissions, the setting of mitigation targets, and the places of adaptation and geo-engineering in the policy portfolio.

The scientific basis for adaptation

The Intergovernmental Panel on Climate Change's (IPCC) Fourth Assessment Report states that: "[w]arming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level." Specifically, it finds that:

- many natural systems are being affected by regional climate changes, particularly temperature increases;
- most of the observed increase in global average temperatures since the mid-20th century is *very likely* due to the observed increase in anthropogenic GHG concentrations;
- discernible human influences extend beyond average temperature to other aspects of climate;
- anthropogenic warming over the last three decades has *likely* had a discernible influence at the global scale on observed changes in many physical and biological systems;
- continued GHG emissions at or above current rates would cause further warming and induce many changes in the global climate system during the 21st century that would *very likely* be larger than those observed during the 20th century;
- altered frequencies and intensities of extreme weather, together with sea level rise, are expected to have mostly adverse effects on natural and human systems;
- anthropogenic warming and sea level rise would continue for centuries due to the time scales associated with climate processes and feedbacks, even if GHG concentrations were to be stabilised;
- anthropogenic warming could lead to some impacts that are abrupt or irreversible, depending upon the rate and magnitude of the climate change;
- a wide array of adaptation options is available, but more extensive adaptation than is currently occurring is required to reduce vulnerability to climate change. There are barriers, limits and costs, which are not fully understood;
- adaptive capacity is intimately connected to social and economic development but is unevenly distributed across and within societies.

The Report also emphasises five 'reasons for concern' previously identified in the Third Assessment Report (2001) as a framework to consider key vulnerabilities. These are:

- Risks to unique and threatened systems such as polar and high mountain communities and ecosystems and biodiversity hotspots.
- Risks of extreme weather events such as droughts, heat waves and floods.
- Distribution of impacts and vulnerabilities. There are sharp differences across regions and those in the weakest economic position are often the most vulnerable to climate change. There is increasing evidence of greater vulnerability of specific groups such as the poor and elderly not only in developing but also in developed countries. Moreover, there is increased evidence that low-latitude and less developed areas generally face greater risk, for example in dry areas and mega-deltas.
- Aggregate impacts. The net costs of impacts of increased warming are projected to increase over time.
- Risks of large-scale singularities such as sea level rise from thermal expansion and melting ice sheets.

IPCC, 2007, 'Climate Change 2007: Synthesis Report', Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Intergovernmental Panel on Climate Change, Geneva

http://www.ipcc.ch/publications_and_data/ar4/syr/en/contents.html

UNFCCC, 2007, 'Climate Change: Impacts, Vulnerabilities, and Adaptation in Developing Countries', United Nations Framework Convention on Climate Change, Bonn

<http://unfccc.int/resource/docs/publications/impacts.pdf>

This book outlines the impact of climate change in four developing country regions: Africa, Asia, Latin America and small island developing States; the vulnerability of these regions to future climate change; current adaptation plans, strategies and actions; and future adaptation options and needs.

McMullen, C. P. and Jabbour, J. (eds.), 2009, 'Climate Change Science Compendium 2009', United Nations Environment Programme, Nairobi

<http://www.unep.org/compendium2009>

The Climate Change Science Compendium is a review of some 400 major scientific contributions to our understanding of Earth Systems and climate that have been released through peer-reviewed literature or from research institutions over the last three years, since the close of research for consideration by the IPCC Fourth Assessment Report. Evidence of unexpected rates of change in Arctic sea ice extent, ocean acidification, and species loss emphasizes the urgency needed to develop management strategies for addressing climate change.

Adaptation and development

Following the release of the IPCC's Fourth Assessment Report, it has become increasingly apparent that, even with concerted mitigation efforts, climate change will have far reaching consequences for poverty reduction efforts and the achievement of the Millennium Development Goals (MDGs). Climate change impacts are expected to fall predominantly on the world's poorest people, who have the least capacity to respond. Slow-onset climatic changes will lead to reductions in both the quality and quantity of natural resources which the poor depend on. Specific projected impacts include disruption to agricultural production, reduced food security, increased malnutrition through drought, reduced access to clean water, more favourable conditions for the spread of vector-borne diseases, increased heat stress and more diarrheal diseases. Impacts will also be felt through increases in the frequency and intensity of sudden onset disasters such as flooding, leading to the destruction of infrastructure and displacement. More broadly climate change is expected to have a negative impact on economic growth in many countries with repercussions for poverty reduction efforts. A related concern in this context is the relationship between climate change and human rights. For discussion of rights-based approaches in the context of climate change, see the [environment section](#) of the GSDRC's human rights topic guide.

As a result, adaptation to climate change is rapidly rising up the development agenda. Broadly speaking there are two distinct perspectives on how to approach adaptation in developing country contexts: one focuses on responding to specific predicted climate impacts and managing risk. The other is more concerned with reducing vulnerability and building resilience and adaptive capacity. Between these two extremes is a continuum of interventions from 'pure' adaptation measures on the one hand to 'pure' development activities on the other. In practice, most interventions fall somewhere between these two extremes. It is increasingly recognised however that successful adaptation will require interventions which address the range of challenges along the whole spectrum and, as a result, there is an ever greater focus on mainstreaming adaptation into development planning (see [adaptation guidance and tools: mainstreaming adaptation into development programming](#)). This has important implications for how adaptation is financed and there remains much debate about the extent to which official development assistance (ODA) should contribute towards adaptation efforts (see [financing adaptation](#)).

McGray, H., Hammil, A. and Bradley R., 2007, 'Weathering the Storm: Options for Framing Adaptation and Development' , World Resources Institute, Washington DC

<http://www.gsdrc.org/go/display&type=Document&id=3912>

How can climate change adaptation and development become mutually reinforcing? This report reviews over a hundred case studies to explore the link between adaptation and development. It concludes that the relationship between the two concepts has never been properly articulated, resulting in missed opportunities for collaboration. Donors need to incorporate adaptive strategies into their development planning, particularly in fostering accountable decision-making processes and in reducing the vulnerability of populations to climate change impacts.

Klein, R. J. T., Eriksen, S. E. H. and Ulsrud, K., 2007, 'Climate Change Adaptation and Poverty Reduction: Key Interactions and Critical Measures', Global Environmental Change and Human Security, Oslo

<http://www.gsdrc.org/go/display&type=Document&id=3971>

What are the links between poverty reduction and adaptation to climate change? How can these place-specific links be identified in any given context? Three key types of sustainable adaptation interventions target vulnerability-poverty links, reducing both poverty and vulnerability to climate change. These are activities that: 1) address climate risk, 2) strengthen adaptive capacity, and 3) focus on the factors creating vulnerability. Identifying them involves asking: How do people secure or fail to secure needs? What is the influence of climate change on how people secure or fail to secure needs? What new measures or alterations to existing interventions are needed?

Huq, S., Reid, H. and Murray, L. A., 2006, 'Climate Change and Development Links', Gatekeeper Series 123, International Institute for Environment and Development, London

<http://www.gsdrc.org/go/display&type=Document&id=3953>

Despite evidence showing a strong relation between development and climate change, why have the two fields developed separately, and what effects has this had? There have been successful integration efforts, but most government agencies in developing and least developed countries, and most local-level development groups, still do not adequately incorporate climate change into their development activities. It is vital to the success of both development and climate change policies that climate change be incorporated into development programmes at international, regional, national and local levels.

The costs of adaptation

The rationale for estimating the costs of adaptation is to support decision-making either at a global level – to determine whether the costs of adaptation outweigh the costs of inaction and to provide an idea of the level of overall investment required, or at the local level – to evaluate, prioritize and sequence potential adaptive measures in response to specific climate risks.

The well publicised Stern Review on the Economics of Climate Change unequivocally concludes that: “the benefits of strong and early action far outweigh the economic costs of not acting” (Stern, 2006). The Review estimates the cost of inaction as equivalent to between 5 per cent and 20 per cent of global GDP per year, compared to the cost of mitigating the worst impacts of climate change at around 1 per cent of global GDP per year.

Compared to the research on the economic costs of *mitigating* climate change, studies estimating the global costs of *adaptation* are relatively unsophisticated. Studies do not cover all countries, nor the full range of impacts and associated adaptation options within countries. Of the few studies that do exist, costs are generally calculated along sectoral lines and do not take account of additional costs such as adaptive capacity building, or institutional and administrative costs. There is also a focus on ‘hard’ structural adaptation measures as opposed to ‘soft’ policy interventions which are more difficult to measure, and a tendency to estimate investment costs, rather than the lifetime costs of adaptation measures. For these and other reasons a number of studies suggest that most estimates may in fact substantially underestimate the real costs.

Notwithstanding these limitations, global estimates of the costs of adaptation generally exceed \$100 billion per year. The most recent study (World Bank, 2010) puts the cost between 2010 and 2050 for developing countries alone at \$70 billion to \$100 billion a year, equivalent to 0.2 per cent of the projected GDP of all developing countries in the current decade and to 80 per cent of total disbursement of overseas development assistance (ODA).

Some argue that trying to artificially separate the costs of adaptation from the financing needs of development is neither possible nor desirable. This perspective calls for a shift away from the study of incremental adaptation to a focus instead on ‘climate-resilient development’ (see [Low carbon and climate resilient development](#)). One recent study (Fankhauser and Schmidt-Traub, 2010), for example, has estimated the costs of climate-proofing the Millennium Development Goals (MDGs) for Africa at around US\$100 billion a year for the next decade, compared with \$72 billion a year for the MDGs alone. Others, however, point to the need to maintain clear dividing lines to ensure that funding for adaptation is additional to existing overseas development assistance (ODA) commitments. What is clear from the range of estimates is that current mechanisms and sources of financing are insufficient to meet the challenge (see [financing adaptation](#)).

World Bank, 2010, ‘The Economics of Adaptation to Climate Change. A Synthesis Report’, Final Consultation Draft, The World Bank Group, Washington DC

<http://www.gsdr.org/go/display&type=Document&id=3891>

How much will it cost to help developing countries adapt to climate change? How can country development plans incorporate adaptation measures? This study estimates the cost between 2010 and 2050 of adapting to a two-degree temperature increase by 2050 as between \$70-\$100 billion a year. This is more than 80 per cent of the development assistance given in 2008, but is approximately 0.17 per cent of developing countries' GDP. Key lessons are to build flexibility into both policies and hardware and to ensure that outside assistance for institutional reform builds on internally-driven changes.

Parry, M., N. et al., 2009, ‘Assessing the Costs of Adaptation to Climate Change: A review of the UNFCCC and Other Recent Estimates’, International Institute for Environment and Development and the Grantham Institute for Climate Change, London

<http://www.gsdr.org/go/display&type=Document&id=3895>

How realistic are current estimates of adaptation costs for climate change? Will low investment levels in some regions require full funding of climate change development? This report analyses the United Nations Framework Convention on Climate Change (UNFCCC) and argues that its climate change adaptation costs are substantially under-estimated. It recommends more detailed assessments of residual damage that might occur if adaptation funding is inadequate and calls for analyses of country- and sector-specific adaptation costs.

The UNFCCC estimates reviewed in Parry et al. (2009) are detailed in the following document:

UNFCCC, 2007, 'Investment and Financial Flows to Address Climate Change', Background paper, United Nations Framework Convention on Climate Change, Bonn

http://unfccc.int/files/cooperation_and_support/financial_mechanism/application/pdf/background_paper.pdf

Fankhauser, S. and Schmidt-Traub, G., 2010, 'From Adaptation to Climate-Resilient Development. The Costs of Climate-Proofing the Millennium Development Goals in Africa', Grantham Research Institute and Centre for Climate Change Economics and Policy, London School of Economics and Political Science, London

<http://www.gsdr.org/go/display&type=Document&id=3868>

How much would it cost to ensure that the Millennium Development Goals are achieved in Africa despite climate change? This paper estimates that climate-resilient development in Africa could require international financial assistance of \$100 billion a year over the period 2010-2020. This total is about forty percent higher than the original MDG estimate of \$72 billion. Adaptation is, in fact, climate-resilient development, and integrated adaptation and development frameworks must be applied in the form of concrete development plans at the country level.

Agrawala, S. and Fankhauser, S. (eds), 2008, 'Economic Aspects of Adaptation to Climate Change: Costs, Benefits and Policy Instruments', Organisation for Economic Cooperation and Development, Paris

<http://www.gsdr.org/go/display&type=Document&id=3921>

This report assesses adaptation costs and benefits in key climate-sensitive sectors, as well as across sectors. It moves the discussion beyond cost estimation to examining market and regulatory mechanisms that can be used to incentivise adaptation actions. It argues that for adaptation to be effective, a number of policy measures will be required to prepare the ground. A combination of markets and public policy can refine risk sharing (through innovative insurance schemes), improve natural resource management (through the creation of environmental markets) and help climate-proof infrastructure (through Public-Private Partnerships).

Stern, N., 2006, 'The Stern Review on the Economics of Climate Change', HM Treasury, London

<http://bit.ly/fPkeFL>

Key climate change and development information resources

Web portals

- **Climate-L.org** is a knowledge management project which provides news and information on the activities of the UN and international organizations in responding to the problem of global climate change. Climate-L.org is managed by the International Institute for Sustainable Development (IISD).
<http://climate-l.iisd.org>
- The **Eldis climate change adaptation dossier** provides a summary of current thinking on climate adaptation issues with access to relevant and up to date resources and publications for researchers, practitioners, and policy formers.
<http://www.eldis.org/go/topics/dossiers/climate-change-adaptation>
- The **Tiempo climate cyberlibrary** offers news, features and comment on climate change and development issues as well as access to key documents, websites and other resources concerned with climate and sustainable development. The cyberlibrary is co-produced by the Stockholm Environment Institute (SEI) and the International Institute for Environment and Development (IIED).
<http://www.tiempocyberclimate.org/>

- The **India Environment Portal's climate change page**, managed by the Centre for Science and Environment (CSE), is a one-stop shop for information on climate change and development issues
<http://indiaenvironmentportal.org.in/category/thesaurus/climate-change>
- **SciDevNet's topic gateway on climate change and energy** brings together news and feature articles, background analysis and opinion on climate change and development
<http://www.scidev.net/en/climate-change-and-energy/topic-introduction/climate-change-energy-introduction.html>

Research organisations

- **The World Resources Institute (WRI)** conducts independent research and develops policy options on climate protection, adaptation, and governance and access
<http://www.wri.org/climate>
- **The Stockholm Environment Institute (SEI)** conducts research to support policy change on climate risk, adaptation and mitigation in developed and developing countries
<http://sei-international.org/index.php/reducing-climate-risk>
- **The Overseas Development Institute's (ODI)** research on climate change focuses on the use of climate science in developing countries and on pro-poor mitigation and adaptation policies
<http://www.odi.org.uk/work/themes/details.asp?id=6&title=climate-change>
- **The International Institute for Environment and Development's (IIED) Climate Change Group** collaborates with partner organisations and individuals in developing countries on adaptation issues
<http://www.iied.org/climate-change>
- **The International Research Institute for Climate and Society (IRI)** aims to enhance society's capability to understand, anticipate and manage the impacts of climate in order to improve human welfare and the environment, especially in developing countries
<http://portal.iri.columbia.edu>
- **The Grantham Research Institute on Climate Change and the Environment** at the London School of Economics and Political Science (LSE) brings together international expertise on economics, finance, geography, international development and political economy.
<http://www2.lse.ac.uk/GranthamInstitute>
- **The Tyndall Centre for Climate Change Research** is an interdisciplinary research centre which brings together scientists, economists, engineers and social scientists who are working to develop sustainable responses to climate change
<http://www.tyndall.ac.uk>

The impact of climate change on poverty and vulnerability

Understanding vulnerability in the context of climate change

Understanding what is meant by vulnerability in the context of climate change is crucial for developing effective adaptation responses. Vulnerability is generally defined as either a biophysical or social condition, depending on whether climate change is conceived principally as a scientific or a social concern. A related distinction is made between vulnerability as an end-point linked to specific projected climate impacts or as a starting point, i.e. the pre-existing political, institutional, economic and social context within which the impacts of climate change are experienced. Thus in the scientific framing, the focus tends to be on developing technical responses at the sectoral level based on probable scenarios, whereas the social approach focuses on building the capacity of social groups and institutions to cope with a range of potential stresses and changes, including but not limited to, climatic changes.

The IPCC's Fourth Assessment Report defines vulnerability as "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, the sensitivity and adaptive capacity of that system." (IPCC, 2007) This interpretation, which remains the dominant one in climate change debates, is largely in keeping with the biophysical understanding of vulnerability. Much of the development literature on the other hand, takes a social perspective, emphasising the importance of social and institutional context in shaping vulnerability of the poor and excluded in particular, and focussing on the role of factors such as gender, age, culture, education and ethnicity in determining vulnerability. Increasingly, attention is also being given to the role of these social groups in developing effective responses to, rather than simply as victims of, climate change (see [vulnerability of different social groups](#)).

O'Brien, K. et al, 2007, 'Why Different Interpretations of Vulnerability Matter in Climate Change Discourses', *Climate Policy*, Vol. 7, pp. 73–88

<http://www.gsdr.org/go/display&type=Document&id=3896>

Vulnerability in the context of climate change has differing meanings in the discourse of natural and social scientists. 'Outcome vulnerability' is linked to a scientific framing of climate change, and 'contextual vulnerability' to a human-security framing. Can these different interpretations be integrated into a common framework? This study examines the case of Mozambique, and shows how different types of knowledge and policy responses to climate change are prioritised in the different disciplines. It argues that, rather than attempting to integrate the two interpretations of vulnerability into one framework, they should be seen as complementary approaches to climate change.

Brooks, N., 2003, 'Vulnerability, Risk and Adaptation: A Conceptual Framework', Working Paper 38, Tyndall Centre for Climate Change Research, University of East Anglia, Norwich

<http://www.gsdr.org/go/display&type=Document&id=3979>

In studying and addressing vulnerability and adaptation, different formulations of vulnerability lead to confusion. These need to be distinguished from each other, and clear statements are needed on how terms are being defined. The 'official' definition of vulnerability used by the Intergovernmental Panel on Climate Change (IPCC) is very similar to long-established definitions of risk used in the natural hazards community. Clarity might be enhanced by distinguishing between this kind of 'biophysical vulnerability' and the socially constructed vulnerability focused on by social scientists.

Adger, W., N., 2006, 'Vulnerability', *Global Environmental Change*, Vol. 4, pp 254-266

<http://www.gsdr.org/go/display&type=Document&id=3922>

What is the present state of vulnerability research and how does it link with the fields of climate change adaptation and resilience? This paper reviews the research traditions of vulnerability to environmental change and the challenges for present vulnerability research in integrating with the domains of resilience and adaptation. It demonstrates that the fields of vulnerability, adaptation and resilience share many points of convergence and mutual challenges, pointing to common ground for learning between presently disparate traditions and communities.

The convergence of several distinct but interrelated stressors over the next two decades will require an interdisciplinary and integrated understanding of vulnerability. In addition to climate change, for example, population growth and rising food prices are likely to intensify vulnerability. A more holistic analytical framework will therefore be needed.

Sumner, A., and Mallett, R., 2011, 'Snakes and Ladders Buffers and Passports: Rethinking Poverty, Vulnerability and Wellbeing', Working Paper 83, International Policy Centre for Inclusive Growth, UNDP, Brasilia
<http://www.ipc-undp.org/pub/IPCWorkingPaper83.pdf>

Vulnerability of different social groups

It is widely asserted that the poor will be hardest hit by the impacts of climate change, especially those whose livelihoods are most heavily dependent on natural resources. The vulnerability of the poor is generally seen as resulting from limited access to assets combined with physical exposure to predicted climate-related hazards, and discussed in terms of broad groupings (e.g. low-income countries, people living on less than \$2 a day). An alternative perspective calls for a more nuanced multi-dimensional analysis of poverty at the micro-level which places particular emphasis on existing vulnerability of different groups of poor people to natural variations in the climate and to the coping capacity they already possess.

Tanner, T. and Mitchell, T., 2008, 'Building the Case for Pro-poor Adaptation' in Poverty in a Changing Climate, IDS Bulletin, 39:4, IDS, Brighton
<http://www.gsdrc.org/go/display&type=Document&id=3876>

Why must climate change adaptation be pro-poor? What are the links between adaptation and poverty and how can pro-poor adaptation inform climate-resilient poverty reduction at all scales? This article argues that adaptation to climate change will be inefficient and inequitable if it does not consider the multidimensional and differentiated nature of poverty and vulnerability.

GSDRC, 2007, 'Climate Change and Social Exclusion', Helpdesk Research Report, GSDRC, Birmingham
<http://www.gsdrc.org/go/display&type=Helpdesk&id=416>

Whilst there is a body of research on climate change vulnerability, very little research attempts to disaggregate 'the poor' and look in detail at specific issues and implications for socially excluded groups. From the literature which does exist, key issues identified for children include their increased vulnerability to health problems and the need to ensure Disaster Risk Reduction (DRR) strategies are child-focused and include the perspectives of children and young people. In the case of older people, their ability to adapt to climate change may be affected by changes to family networks, migration, a lack of insurance or pension facilities among the rural poor and the need to care for orphaned grandchildren. In terms of gendered impacts of climate change, much of the literature argues that climate change has differential impacts on men and women, and that gendered aspects of mitigation and adaptation must not be overlooked by policymakers. Authors also emphasise the importance of strengthening women's voice in national and international climate change negotiations.

Women

As the majority of the world's poor, women are likely to be disproportionately affected by the impacts of climate change. Girls and elderly women especially are often the most vulnerable in times of stress. Particular vulnerabilities are identified with regards to access to health, dependence on agriculture and access to water, formal and informal labour, climate-related disasters, displacement and conflict. Increasingly however, the characterisation of women solely as victims of climate change is being challenged. There are calls for a more thorough gendered analysis of climate change impacts so that responses can be better tailored to the specific needs of both men and women, and women's perspectives are included in decision-making processes at all levels.

Terry, G., 2009, 'Climate Change and Gender Justice', Practical Action Publishing
http://www.oxfam.org.uk/resources/downloads/wigad_climate/WIGAD_climate_change_gender_justice_book_pap.pdf

Brody, A., Demetriades, J. and Esplen, E., 2008, 'Gender and Climate Change: Mapping the Linkages. A Scoping Study on Knowledge and Gaps', BRIDGE, Institute of Development Studies, Brighton
<http://www.gsdrc.org/go/display&type=Document&id=3901>

What is gender equality in the context of climate change? How can adaptation and mitigation measures help to reduce gender inequality? This paper discusses links between climate change and gender inequality and identifies gaps in current research on gender and the environment. It finds that involving women fully in adaptation and mitigation processes will help to redress gender inequality and ensure that the human impacts of climate change are more effectively addressed. Removing obstacles to women's participation requires support for grassroots awareness-raising, confidence building, advocacy and leadership training programmes.

Mitchell, T., Tanner, T. and Lussier, K., 2007, 'We Know What We Need: South Asian Women Speak Out on Climate Change Adaptation', ActionAid, London

<http://www.gsdrc.org/go/display&type=Document&id=3916>

How are poor women in Bangladesh, India and Nepal managing to protect their lives, homes, assets and livelihoods from weather-related hazards? This study of women in rural communities in the Ganga river basin shows that they have started to adapt to climate change and can clearly articulate what they need to secure and sustain their livelihoods. Their priorities include: a safe place to live and store their harvest and livestock during the monsoon season; better access to services such as training; and information about adaptation strategies and livelihood alternatives. They also need access to resources in order to implement effective strategies and overcome constraints. Adaptation funds must play a key role in promoting women's rights.

Children

Children are particularly susceptible to disaster-related and health impacts of climate change including an increased prevalence of malaria, diarrhoea and under-nutrition. However, as with other social groupings, the idea that children should be seen solely as victims of climate change is contested. Instead children are increasingly portrayed as active agents of change who have an important stake in the future. A rights perspective requires that greater attention be paid to children's issues in adaptation policies and that they play a role in decisions that affect them.

UNICEF, 2008, 'Climate Change and Children: A Human Security Challenge' Policy Review Paper, United Nations Children's Fund Innocenti Research Centre, Florence

<http://www.gsdrc.org/go/display&type=Document&id=3900>

How can the international community better incorporate the needs of children into its climate change and human security policies? This report contends that while children have a unique vulnerability to the effects of climate change, many of the mechanisms currently being used to address this phenomenon fail to take their needs into consideration. It recommends that children's issues be made central to the international human security agenda and that children themselves be given a larger role to play in influencing and creating policy to address climate change.

Save the Children, 2008, 'In the Face of Disaster: Children and Climate Change', International Save the Children Alliance, London

<http://www.gsdrc.org/go/display&type=Document&id=3925>

What should the international community do to reduce children's vulnerability to the effects of climate change? This report analyses the impacts of climate change on children and calls for more and better measures by the international community to mitigate these effects. Donors should increase their aid budgets, mainstream Disaster Risk Reduction in their programming, and ensure a focus on traditionally under-funded areas particularly relevant to children.

Older people

HelpAge, 2009, 'Witness to Climate Change: Learning from Older People's Experience', Briefing, HelpAge International, London

<http://www.gsdrc.org/go/display&type=Document&id=3927>

This paper is based on research with older men and women from Bangladesh, Bolivia, Ethiopia, India, Kenya, Kyrgyzstan, Mozambique, Tanzania, and Zimbabwe. It looks at older people's experience and awareness of climate change, and calls for better inclusion of their views in developing adaptive strategies. Older people are particularly vulnerable to the effects of climate change and are repositories of indigenous knowledge and experience that could contribute to local and national adaptation. They are, however, excluded from climate change debates.

Minorities

Minority Rights, 2008, 'The Impact of Climate Change on Minorities and Indigenous Peoples' Briefing paper, Minority Rights Group, London

<http://www.gsdrc.org/go/display&type=Document&id=3945>

How do climate-related disasters and slow onset climate changes affect minorities and indigenous peoples? Why are these groups especially sensitive to the effects of climate change? In examining such questions, this report highlights a neglected area of research, and the important role of these groups as stewards of natural environments that are major

carbon sinks and biodiversity hotspots. It argues for the explicit inclusion of minority and indigenous groups in plans for combating and adapting to climate change. National Adaptation Programmes of Action, international human rights law, and new guidelines for international relief agencies provide opportunities for these vulnerable groups to make themselves heard.

Additional online resources

- **CARE International's Climate Change Information Centre** supports the empowerment of poor and marginalised people to take action on climate change at all levels and to build knowledge for global change.
<http://www.careclimatechange.org/>
- **Practical Action's Climate Change Programme** includes policy, research and lobbying work.
<http://practicalaction.org/climate-change>
- **GenderCC– Women for Climate Justice** is a global network of women and gender activists and experts from all world regions working for gender and climate justice.
<http://www.gendercc.net>
- **WEDO – Women's Environment & Development Organization's Climate Change Programme** works to ensure that women are present at all levels and dimensions of climate change policy-making, strategizing and action.
<http://www.wedo.org/category/themes/sustainable-development-themes/climatechange>
- **The Global Gender and Climate Alliance (GGCA)** works to ensure that climate change policies, decision-making, and initiatives at the global, regional, and national levels are gender responsive.
<http://www.gender-climate.org>
- **Children in a Changing Climate** is a coalition of leading child-focused research, development and humanitarian organisations with a commitment to share knowledge, coordinate activities and work with children as agents of change.
<http://www.childreninachangingclimate.org>
- **HelpAge International's climate change policy work** aims to get older people's voices heard in the climate change debate
<http://www.helpage.org/what-we-do/climate-change/climate-change-policy>

Adaptation response measures: financing and governance

International policy framework for adaptation

The principle international policy framework for dealing with climate change is the United Nations Framework Convention on Climate Change (UNFCCC). Signed at the Rio Earth Summit in 1992, the UNFCCC represents an attempt to stabilise greenhouse gas (GHG) concentrations in the atmosphere at a level that would prevent dangerous anthropogenic climate change (an average global temperature rise of no more than 2°C). Under the convention, the Kyoto protocol sets binding GHG emissions targets for those industrialised countries which have signed up to it, amounting to an average of five per cent against 1990 levels over the five-year period 2008-2012. Recent attempts to agree on a successor to Kyoto beyond 2012, most notably at the 2009 UNFCCC Conference of Parties (CoP) in Copenhagen, have had limited success.

Within the context of the UNFCCC and international policy discussions on climate change, the issue of adaptation has only recently become a priority. The 2007 Bali Action Plan (BAP) was key in raising the political status of adaptation by giving equal importance to action on both mitigation and adaptation. Under the UNFCCC a range of programmes have been established to assist developing countries in formulating and implementing adaptation plans, chiefly:

- **National Adaptation Programmes of Action (NAPAs):** NAPAs are multi-stakeholder assessments through which least developed countries (LDCs) identify their urgent and immediate adaptation needs. As of July 2009, 42 out of 49 NAPAs had been submitted and 439 projects had been identified, at a total aggregate cost of \$1.7 billion (see also [national-level adaptation planning](#)).
http://unfccc.int/national_reports/napa/items/2719.php
- **The Nairobi Work Programme on impacts, vulnerability and adaptation to climate change (NWP):** The NWP is a five-year (2005-2010) programme on the scientific, technical and socio-economic aspects of vulnerability and adaptation. It aims to assist countries to improve their understanding of impacts, vulnerability and adaptation to make informed decisions on practical adaptation actions and measures to respond to climate change.
http://unfccc.int/adaptation/nairobi_work_programme/items/3633.php

Schipper, E., L., Cigarán, M., P., Hedger, M., 2008, 'Adaptation to Climate Change: the New Challenge for Development in the Developing World', UNDP Environment & Energy Group, New York
<http://www.gsdrc.org/go/display&type=Document&id=3877>

What are the challenges facing countries in adapting to climate change? Adaptation involves a process of sustainable and permanent adjustment to climate change and has clear policy links to economic development, poverty reduction, and disaster management strategies. Successful adaptation policies will require long-term thinking and consideration of climate change impacts at international, national, regional, local and community levels. Adaptation planning must consider vulnerabilities to climate change, appropriate technologies, capacity, and local coping practices as well as government policies and actions.

Financing adaptation

Funding for adaptation under the UNFCCC is delivered through the Global Environment Facility (GEF) and the Adaptation Fund Board (AFB).

The GEF administers three climate funds:

- The Strategic Priority on Adaptation (SPA) to support pilot and demonstration projects that generate both local (development-focused) and global benefits;
- The Least Developed Countries Fund (LDCF) to support the preparation and implementation of NAPAs; and
- The Special Climate Change Fund (SCCF) to support long-term adaptation measures that increase the resilience of national development sectors to the impacts of climate change.

The AFB operates the Adaptation Fund under the Kyoto Protocol to finance concrete adaptation projects and programmes in developing countries that are Parties to the Kyoto Protocol. Unlike other funds that rely mainly on

donor contributions, this fund is financed with a 2 per cent share of proceeds from clean development mechanism (CDM) projects.

In addition, funding for adaptation is now increasingly being delivered through a proliferation of multilateral and bilateral channels, most notably through the World Bank's Pilot Programme for Climate Resilience (PPCR), the adaptation component of the Banks' multi-donor [Climate Investment Funds](#). In fact these now significantly outweigh UNFCCC channels in terms of the levels of funding available (see Figure 1 below).

To date, adaptation finance from all these sources has been allocated primarily towards adaptation assessment, planning and capacity-building. There are now calls for the focus to begin switching to the implementation of adaptation initiatives. (See Figure 1 on next page.)

Recent developments

One of the few areas in which progress was made at the 2009 Conference of Parties (CoP) in Copenhagen was in the area of climate finance. Although not legally binding, the Copenhagen Accord committed developed countries to provide \$100 billion dollars a year by 2020, including a \$30 billion 'fast-start' pledge between 2010 and 2012 to address the needs of developing countries with balanced allocation between adaptation and mitigation. This funding is to come from a wide variety of sources, public and private, bilateral and multilateral, including alternative sources of finance. Crucially however, there remains much uncertainty and disagreement on appropriate principles and mechanisms for administering, channelling and allocating these funds. A further issue is how funding will be generated and the extent to which it represents 'new and additional' resources over and above existing overseas development assistance (ODA) commitments.

Persson, A. et al., 2009, 'Adaptation Finance under a Copenhagen Agreed Outcome', Research Report, Stockholm Environment Institute, Stockholm

<http://www.gsdr.org/go/display&type=Document&id=3941>

How can an agreement on adaptation finance be reached as part of the United Nations Framework Convention on Climate Change (UNFCCC)? This report examines the issues in relation to the three stages of adaptation finance: generation, governance and delivery. The block in negotiations can often be attributed to different perceptions of what is 'equitable' and 'fair' burden-sharing. Recommendations include the need for agreement on measurable allocation criteria to facilitate objective decision-making.

Schalatek, L., Bird, N. and Brown, J., 2010, 'Where's the Money? The Status of Climate Finance Post-Copenhagen', Heinrich Böll Foundation and ODI

<http://www.gsdr.org/go/display&type=Document&id=3949>

What progress was made regarding climate finance at the 2009 talks in Copenhagen? The 'Copenhagen Accord' gives some clear promises and numbers for both short- and long-term financial support to help developing countries, especially the most vulnerable, to address climate change. It pledges US\$10 billion per year from 2010-2012, then US\$100 billion per year from 2020. However, as the Accord is a non-binding political agreement, if and how those commitments can be fulfilled remains uncertain. The Advisory Group on Climate Change Financing will submit its final recommendations before the Cancun meeting in December 2010.

Bapna M. and McGray H., 2008, 'Financing Adaptation: Opportunities for Innovation and Experimentation', World Resources Institute, Washington DC

<http://www.gsdr.org/go/display&type=Document&id=3942>

How should funding for climate change adaptation be generated, channelled and spent? This paper explores the opportunities and challenges involved in financing adaptation efforts in developing countries. Helping developing countries adapt to climate change will involve enormous resources, above those already assigned for development. Finance mechanisms that can deliver this additional level of resource need to be designed. Separating the different processes around generating, channelling and spending adaptation finance offers a way forward. Donor country policymakers need to understand that effective approaches to adaptation finance will require attention to all three phases of decision-making, and to the interplay among them in any political context.

Figure 1: Principle multilateral and bilateral climate adaptation funds
Amounts pledged, deposited and disbursed

Adapted from: Climate Funds Update (November 2010)

Fund Name	Pledged US\$ million	Deposited US\$ million	Dispersed US\$ million
Funds exclusively for adaptation			
Pilot Program for Climate Resilience <i>The World Bank</i>	981.84	174.70	9.01
Least Developed Countries Fund <i>The Global Environment Facility (GEF)</i>	221.45	169.19	141.96
Adaptation Fund <i>Adaptation Fund Board</i>	197.05	169.99	9.46
Special Climate Change Fund <i>The Global Environment Facility (GEF)</i>	147.78	110.48	97.17
Funds which include an adaptation component (percentage varies)			
Hatoyama Initiative <i>Government of Japan</i>	15,000.00	5,320.00	5,319.89
GEF Trust Fund: Climate Change focal area (GEF 5) <i>The Global Environment Facility (GEF)</i>	1,359.38	0.00	0.00
GEF Trust Fund: Climate Change focal area (GEF 4) <i>The Global Environment Facility (GEF)</i>	1,032.92	1,032.92	1,023.49
Amazon Fund (Fundo Amazônia) <i>Brazilian Development Bank (BNDES)</i>	1,000.00	110.00	59.91
International Climate Initiative <i>Government of Germany</i>	519.60	515.61	258.02
Global Climate Change Alliance <i>The European Commission</i>	204.15	201.75	8.10
MDG Achievement Fund: Environment and Climate Change thematic window - <i>UNDP</i>	89.50	89.50	61.84

Glemarec, Y., Waissbein, O. and Bayraktar, H., 2010, 'Human Development in a Changing Climate: A Framework for Climate Finance', Discussion Paper, Energy and Environment Group, UNDP, New York

<http://www.gsdrc.org/go/display?type=Document&id=3937>

How can climate finance be raised from a variety of sources at scale? How can this finance be delivered to where it is most needed with sufficient speed and in way that is nationally owned? A country-driven, multi-stakeholder climate finance framework is proposed to meet these objectives, built on four country-level mechanisms. It involves: 1) formulation of low-emissions, climate-resilient development strategies (to bring about bottom-up national ownership, incorporate human development goals, and take a long-term outlook); 2) financial and technical support platforms (to catalyse the required scale of finance and associated capacity); 3) National Adaptation Plan-type instruments (for

balanced and fair access to international public finance); and 4) coordinated implementation and Monitoring, Reporting and Verification systems (to facilitate long-term, efficient results).

The World Resources Institute (WRI) has carried out a preliminary analysis of countries' immediate fast-start pledges announced thus far. The analysis looks at both the amounts and the mechanisms by which funding would be delivered and the extent to which funds can be deemed 'new and additional'.

World Resources Institute: Summary of Developed Country 'Fast-Start' Climate Finance Pledges (regularly updated)
<http://www.wri.org/publication/summary-of-developed-country-fast-start-climate-finance-pledges>

Similarly, the following document analyses the current (midway) status of the 'fast-start' financing scheme.

Brown, J., Stadelmann, M., and Hornlein, L., 2011, 'Fast-start finance to address climate change: what we know at the mid-point', ODI Background Note, Overseas Development Institute, London
<http://www.odi.org.uk/resources/docs/7272.pdf>

Sources, delivery and accountability in adaptation finance

Adaptation finance is distinct from development finance in that it is seen by many developing countries as compensation for the damage caused by climate change rather than as a form of discretionary assistance like ODA. Nevertheless, under current arrangements, adaptation finance comes from both voluntary and mandatory contributions through national budgets and market-based levies.

The plethora of funding mechanisms and channels for adaptation to climate change makes for a complex picture. On the one hand, the GEF is often regarded as cumbersome and non-transparent and has failed to channel anywhere near the volume of funding necessary to address climate issues. On the other hand, the recent proliferation of new bilateral and multilateral funding mechanisms is creating a highly fragmented system which poses significant coordination, ownership and accountability challenges. The pace at which this new adaptation architecture is developing has caused some concern, especially given that there is no overarching framework to govern the delivery of these new funds.

In this context, current debates focus on: whether to strengthen the mandate (and effectiveness) of the GEF; what principles should be established to oversee the delivery of climate finance; how to simplify rules and enable more direct access for developing countries to climate finance; how to ensure that funds are appropriate, sufficient and predictable; and how to ensure that funds are managed transparently at the national level and are responsive to local needs. Increasingly, there are calls for lessons to be drawn from international experience in improving aid effectiveness (underpinned by principles of harmonisation, alignment, country ownership and mutual accountability).

From a development perspective a further key consideration is the extent to which different types of finance are able to target the poorest and most vulnerable. Private finance is seen as particularly ineffective in this regard – as is the GEF – compared to funding channelled through civil society. Targeting of bi-lateral, multi-lateral and state-led funding also needs to be improved.

Porter, G., Bird, N., Kaur, N. and Peskett, L., 2008, 'New Finance for Climate Change and the Environment', WWF and Heinrich Boll Stiftung
<http://www.gsdr.org/go/display&type=Document&id=3952>

What are the implications of the recent proliferation of funding initiatives aimed at addressing global environmental issues? This paper examines eight new bilateral funds and six multilateral funds established to address the challenges related to climate change. It recommends early harmonisation of the financial architecture and greater involvement of developing countries in design processes.

Mitchell, T., Anderson, S. and Huq, S., 2008, 'Principles for Delivering Adaptation Finance', Institute of Development Studies, Brighton
<http://www.gsdr.org/go/display&type=Document&id=3910>

This briefing proposes a set of principles for delivering adaptation finance and uses these to assess the efficacy of different country-level adaptation delivery mechanisms. Currently, accessing adaptation funding is difficult, governance processes lack transparency and decision making favours projects rather than programmatic approaches. Instead, effective delivery of integrated adaptation could be guided by principles of country ownership, prioritising the most

vulnerable, mutual accountability and harmonisation. Countries should be allowed to set their own adaptation priorities and should be supported by flexible, tailored delivery mechanisms that promote programmatic approaches.

CIDSE and Caritas, 2010, 'Business as Unusual. Direct Access: Giving power Back to the Poor?', Discussion Paper, CIDSE, Brussels

<http://www.gsdr.org/go/display&type=Document&id=3924>

Finance for climate action in developing countries is widely agreed to be an essential element of a post-2012 climate agreement, and a key factor in negotiating such finance will be 'Direct Access' (DA). This paper explores the DA concept, examining its challenges and merits, by discussing existing funds that have adopted this modality. Whilst DA is an efficient and effective means of delivering financial support to developing countries, it cannot of itself guarantee inclusivity or engagement with the most vulnerable. Civil society participation and empowerment, multi-stakeholder engagement, and a bottom-up approach are crucial elements in developing a comprehensive DA climate financing model.

Ballesteros, A. and Ramkumar, V., 2009, 'Accounting for Results: Ensuring Transparency and Accountability in Financing for Climate Change', IBP Budget Brief, International Budget Partnership, Washington DC

<http://www.gsdr.org/go/display&type=Document&id=3969>

How will climate change funds be collected, distributed, and accounted for at the international level? What mechanisms are needed to ensure that recipient countries manage these funds in ways that are transparent and responsive to the needs and input of the public? This Brief argues that gathering resources and managing resources need to be considered simultaneously. The next generation of climate finance needs to strengthen the national institutions that will implement mitigation and adaptation activities and ensure their transparency and accountability to citizens within countries, as well as to the international community.

Allocation and additionality of adaptation finance

To date, there has been no agreement on equitable and measurable allocation criteria that can be used for adaptation finance. Debates revolve around the weight which should be given to different criteria such as climate sensitivity, exposure and vulnerability, adaptive capacity, and absorption and implementation capacity, as well as other non-climatic indicators such as population and poverty levels within a country.

In terms of how adaptation finance is actually spent, funding to date has largely been disbursed on a project-by-project basis. Given the piecemeal nature of this approach and the growing recognition of the synergies between many development and adaptation interventions, the emphasis has begun to shift toward integrating adaptation into ongoing development planning (see [adaptation guidance and tools: mainstreaming adaptation into development programming](#).) There is some concern however that this could mean diverting existing ODA pledges towards adaptation activities which could lead to a decrease in flows of aid to certain sectors such as education and health or to certain regions such as Sub-Saharan Africa. In this context there is much debate around the extent to which the commitment under the Copenhagen Accord to provide \$100 a year for adaptation by 2020 represents 'new and additional' funding, especially given that there is no clear baseline against which to measure these pledges. In response, a range of definitions of additionality have been advanced, with a view to reaching a common definition. These include finance that: a) is over and above the 0.7 per cent ODA target; b) represents an increase on 2009 ODA levels directed at climate change activities; c) is set at an agreed percentage in relation to ODA; or d) is altogether separate from ODA. However, each of these interpretations implies trade-offs among different actors and, as such, the current debate is driven largely by political interest rather than considerations of the effectiveness of adaptation finance.

Barr, R., Fankhauser, S., and Hamilton, K., 2010, 'The Allocation of Adaptation Funding', Grantham Research Institute and Centre for Climate Change Economics and Policy, London School of Economics and Political Science

<http://www.gsdr.org/go/display&type=Document&id=3881>

How should climate change adaptation funding be allocated? This paper argues that allocation decisions should focus on the concept of vulnerability. While recognising that expert judgment will always play a role in funding decisions, it recommends the adoption of an empirical approach to allocation in order to ensure transparency, efficiency, and equity. Indicators to guide the allocation of adaptation funding should relate to physical impact, adaptive capacity and implementation capacity.

Brown J., Bird, N. and Schalatek L., 2010, 'Climate Finance Additionality: Emerging Definitions and their Implications', Climate Finance Policy Brief No.2, ODI and Heinrich Boll Foundation

<http://www.gsdr.org/go/display&type=Document&id=3962>

What are the emerging definitions of 'climate finance additionality'? What are the technical and political implications of these different definitions? This policy brief explores these questions and looks at their requirements in terms of tracking, measuring, reporting and verifying finance. Additionality is an important issue; sufficient finance must be channelled towards climate change needs while simultaneously avoiding diversion from development needs. The way additionality is defined by donor governments needs focused attention and debate. Innovative approaches to raising the funds required outside development funding are needed.

Brown, J. Cantore, N. and Willem te Velde, D., 2010, 'Climate Financing and Development. Friends or Foes?', ODI Report, ODI, London

<http://www.gsdr.org/go/display&type=Document&id=3902>

Will finance for climate change adaptation in developing countries compromise support for meeting the Millennium Development Goals? This study analyses country proposals for climate change funding put forward at recent UN-led climate change negotiations. It argues that while the aims of development and adaptation to climate change often overlap, additional funds are needed to meet the specific challenges of global warming. If not, aid may be diverted from development needs to adaptation, resulting in the neglect of aid to certain regions and sectors.

Stadelmann M., Roberts J.T. and Michaelowa A., 2010, 'Keeping a Big Promise: Options for Baselines to Assess "New and Additional" Climate Finance', CIS Discussion Paper no. 66, Center for Comparative and International Studies, Zurich

<http://www.gsdr.org/go/display&type=Document&id=3944>

All major climate policy agreements have stated that climate finance for developing countries will be 'new and additional'. But new and additional to what? This article explores options for agreeing a baseline, and related methodological challenges. It identifies two viable baselines: 'new funding sources only' and 'above pre-defined business as usual level of development assistance'.

National and sub-national governance

Whilst the issue of global governance in relation to climate change adaptation has received much attention over the past few years, much less is understood about how to effectively connect emerging global frameworks with regional, national and local level processes. Because different countries have very different pre-existing adaptive capacities and experiences, approaches to adaptation need to be flexible enough to take this diversity into account. In particular there is a need for a much clearer understanding of the underlying political and institutional factors which will determine whether proposed adaptation interventions are likely to work in a given socio-political context. This is especially true of fragile and conflict-affected states (see [adaptation in fragile and conflict-affected states](#)).

Commission on Climate Change and Development, 2009 'Governance Gaps', Chapter 4 in Closing the Gaps, Disaster Risk Reduction and Adaptation to Climate Change in Developing Countries', Report of the Commission on Climate Change and Development, Stockholm

<http://www.gsdr.org/go/display&type=Document&id=3889>

Climate change has highlighted the urgent need for the reform of governance approaches and institutions. Disaster risk reduction of climate change impacts requires unparalleled international cooperation and new forms of local, national, regional and international governance. This chapter suggests how institutional architecture should be organised to fill 'governance gaps' in order to serve local needs and improve climate change cooperation. Climate change adaptation will require institutions to use local resources, a global vision, and cross-cutting agendas. Recommendations include greater cooperation with city governments and the establishment of national inter-ministerial/inter-agency processes to review adaptation policies and decisions.

GSDRC, 2007, 'Climate Change and Governance', Helpdesk Research Report, GSDRC, Birmingham

<http://www.gsdr.org/go/display&type=Helpdesk&id=351>

Work examining how climate change adaptation knowledge is transferred, the links between mitigation and adaptation and on how institutional and organisational structures contribute to adaptive capacity is beginning to emerge. However, considerable gaps still exist; particularly with research exploring good governance and the design of institutional architecture for adaptation at national, regional and local levels and with studies about how vulnerable communities can be linked more closely into national and international climate policy-making.

Corfee-Morlot, J., Kamal-Chaoui, L., Donovan, M.G., Cochran, I., Robert, A. and Teasdale, P.J., 2009, 'Cities, Climate Change and Multilevel Governance', OECD Environmental Working Papers N° 14, OECD, Paris

<http://www.gsdr.org/go/display&type=Document&id=3968>

What forms of national-local policy links are used in implementing mitigation and adaptation policies? What are the key tools for integrated, multilevel governance of mitigation and adaptation activities, and how can these be applied? This paper highlights a 'hybrid' framework of multilevel governance in which local-regional/national collaboration promotes mutual learning and enhanced effectiveness. Systematic efforts are needed to align incentives across sectoral and cross-sectoral policy areas, so that regional and local policy implementation is successful.

National-level adaptation planning

The principle mechanism guiding national level adaptation planning in developing countries is the National Adaptation Programme of Action (NAPA). NAPAs are designed to assist least developed countries (LDCs) to identify priority activities that respond to their urgent and immediate needs based on an assessment of existing local coping strategies rather than future vulnerability and impacts of climate change.

NAPAs have generally been regarded as effective in terms of raising awareness of national stakeholders about adaptation and driving forward country-owned action plans. Crucially however, they have tended to run independently from existing national development planning processes. This is largely because NAPAs tend to be project-oriented with an emphasis on urgent and immediate adaptation activities and do not consider long-term development objectives. Furthermore, responsibility for preparing and implementing NAPAs and national development plans tends to lie with different ministries. As a result, there are increasing calls to incorporate adaptation into poverty reduction strategy papers (PRSPs) and to strengthen coordination and information exchange between ministries, different levels of government and civil society.

Accordingly, climate change adaptation planning is beginning to move beyond NAPAs to focus on longer-term approaches. One prominent example is the [UNDP's African Adaptation Programme](http://www.undp-aap.org) (www.undp-aap.org), which supports 21 African countries to adjust their national development processes to incorporate climate change risks through integrated adaptation actions and resilience plans.

Osman-Elasha, B. and Downing, T. E., 2007, 'Lessons Learned in Preparing National Adaptation Programmes of Action in Eastern and Southern Africa', European Capacity Building Initiative, Oxford

<http://www.gsdrc.org/go/display&type=Document&id=3931>

What lessons have been learned from the National Adaptation Programmes of Action (NAPAs) in Eastern and Southern Africa? This study looks at the international effort to identify urgent needs and to begin implementing climate adaptation projects in these regions. It concludes that NAPAs have played an important role in creating awareness and a sense of ownership among the different stakeholder groups, from policymakers to the general public at village level. However, the momentum generated must be sustained and funding is now needed to implement projects.

Kramer, A. M., 2007, 'Adaptation to Climate Change in Poverty Reduction Strategies', Occasional Paper for the Human Development Report 2007/2008, Human Development Report Office, United Nations Development Programme, New York

<http://www.gsdrc.org/go/display&type=Document&id=3950>

How far is climate change adaptation integrated into the poverty reduction strategies of developing countries? This paper examines the Poverty Reduction Strategy Papers (PRSPs) and National Adaptation Programmes of Action (NAPAs) of 19 countries and finds low incorporation of adaptation in PRSPs. Countries should develop regional and local climate change institutional frameworks to strengthen the coordination, networking and information flows between different levels of governments and local civil society. The World Bank and United Nations Framework Convention on Climate Change (UNFCCC) must coordinate efforts to support countries developing PRSPs and NAPAs.

Hardee K. and Mutunga, C., 2009, 'Strengthening the Link Between Climate Change Adaptation and National Development Plans: Lessons from the Case of Population in National Adaptation Programmes of Action (NAPAs)', Mitigation and Adaptation Strategies for Global Change, Volume 15, Number 2

<http://www.gsdrc.org/go/display&type=Document&id=3933>

How well are National Adaptation Programme of Actions (NAPAs) integrated with national development strategies in the Least Developed Countries (LDCs)? This paper examines 41 NAPAs from the LDCs. It argues that NAPAs compel developing countries to focus on immediate priorities at the expense of longer-term climate change concerns, such as population growth. The global community needs to adopt longer-term approaches that stress the link between adaptation and development.

World Resources Institute, 2009, 'The National Adaptive Capacity Framework: Key Institutional Functions for a Changing Climate', Pilot Draft, World Resources Institute, Washington, D.C.

<http://www.gsdrc.org/go/display&type=Document&id=3883>

How can countries adapt to climate change? The National Adaptive Capacity framework (NAC) identifies national-level functions that all countries will need to perform to adapt effectively to climate change: assessment, prioritisation, coordination, information management and climate risk reduction. The framework can be used to assess how well functions are being performed and to identify opportunities and priorities for building adaptive capacity and implementing key activities.

Local actors and institutions

Because climate change impacts are local and context specific, the role of local governments is seen as key. They will ultimately have responsibility for implementing adaptation and will need to collaborate with civil society and the private sector. Civil society is deemed particularly important for holding local and national government to account for acting on climate change. There is therefore a pressing need to build institutional capacity at different levels, in particular with regards to: sharing scientific knowledge and incorporating marginalised voices; identifying local needs; ensuring both horizontal and vertical accountability; efficiently transferring resources; coordinating policy across sectors; and cooperating across national boundaries.

Formal and informal institutions influence adaptation by structuring the way climate impacts are experienced, connecting individual and collective responses to these impacts and channelling external resources for adaptation. As such, it is widely recognised that adaptation needs to be based on an understanding of local context and in particular the pressures, obstacles and incentives confronted by local actors. Adaptation to climate change is likely to be but one of a range of competing political and economic priorities (e.g. access to markets, food security). Because top down adaptation processes are often based on optimistic assumptions about the capacity for local bureaucracies to take on new priorities, there is a strong case for greater alignment with existing efforts of local actors to deal with the threats and opportunities that they already face. The role of decentralised governance structures and in particular the need to strengthen the capacity of local actors to prioritize and implement adaptation responses is thus receiving increasing attention.

Christoplos, I. et al., 2009, 'Human Dimensions of Climate Change. The Importance of Local and Institutional Issues', Commission on Climate Change and Development, Stockholm

<http://www.gsdrc.org/go/display&type=Document&id=3936>

Climate change, conflict, and the squeeze on natural resources due to population growth and environmental degradation are intensifying poverty and vulnerability for many people. Local, autonomous adaptation to these challenges is often overlooked by national government and the international development community in their efforts to manage climate change. This paper examines climate-related adaptive capacities – of people, businesses and ecosystems – and suggests a new agenda, supporting individuals and institutions within their local context.

Agrawal A., Perrin N., Chhatre A., Benson C. and Kononen M., 2009, 'Climate Policy Processes, Local Institutions, and Adaptation Actions: Mechanisms of Translation and Influence', Social Dimensions of Climate Change, World Bank, Washington DC

<http://www.gsdrc.org/go/display&type=Document&id=3898>

How can national climate policy processes be translated into local adaptation initiatives? What can be learned from the ways in which natural resource managers have sought to make national resource policies locally responsive and effective? This paper examines national-level adaptation planning efforts and decentralisation reforms. It highlights the need to promote the capacity of local institutions and to strengthen links between local and national adaptation planning. Other recommendations are to: increase local autonomy in adaptation planning and implementation; improve information sharing among decision makers at all levels; and increase the accountability of local decision makers to their constituents.

Brockhaus, M. and Kambire, H., 2009, 'Decentralization: A Window of Opportunity for Successful Adaptation to Climate Change', Chapter 26 in Adger, N. W. (ed.) Adapting to Climate Change: Thresholds, Values, Governance, Cambridge University Press, Cambridge

<http://www.gsdrc.org/go/display&type=Document&id=3986>

This chapter examines the opportunities and barriers for successful adaptation to climate change in decentralisation processes. Using a study of two municipalities in Burkina Faso, it stresses the importance of knowledge and institutional

flexibility in overcoming resource dependency. The varying degrees of space generated by the decentralisation process in the two municipalities demonstrates the importance of individual understanding and decision-making in determining successful adaptation.

Chistoplos, I. , 2010, 'Incentives and Constraints to Climate Change Adaptation and Disaster Risk Reduction – a Local Perspective', Commission on Climate Change and Development, Stockholm

<http://www.gsdr.org/go/display&type=Document&id=3990>

How do the capacities of and constraints experienced by local actors affect their engagement in climate change adaptation and disaster risk reduction (CCA/DRR)? How can development actors improve their efforts to achieve local 'buy-in' to CCA/DRR? This policy brief finds that CCA/DRR implementation requires the creation of an enabling environment for changes in local institutions, markets, political relationships and public service. The design of CCA/DRR interventions should be linked to local priorities and local efforts to pursue market opportunities, and should avoid overburdening local actors.

Tanner, T.M., Mitchell, T., Polack, E. and Guenther, B., 2009, 'Urban Governance for Adaptation: Assessing Climate Change Resilience in Ten Asian Cities', IDS Working Paper 315, Institute of Development Studies, Brighton

<http://www.gsdr.org/go/display&type=Document&id=3929>

How can climate-related impacts be managed in urban settings? What are the links between urban governance, climate adaptation, poverty reduction and sustainable development? This paper develops an analytical framework by combining governance literature with climate resilience assessments conducted in ten Asian cities. The climate-resilient urban governance assessment framework involves: (1) decentralisation and autonomy, (2) accountability and transparency, (3) responsiveness and flexibility, (4) participation and inclusion and (5) experience and support. Use of this framework can assist in assessing and building urban resilience to climate change in a way that reduces the vulnerability of the citizens most at risk from climate shocks and stresses.

Satterthwaite, D., 2008, 'Climate Change and Urbanization: Effects and Implications for Urban Governance', Paper prepared for the United Nations Expert Group Meeting on Population Distribution, Urbanization, Internal Migration and Development, 21-23 January 2008, New York, UNDESA

<http://www.gsdr.org/go/display&type=Document&id=3375>

How can municipal governments in low- and middle-income nations prepare for and adapt to the increasing risks posed by climate change? This paper, published by the United Nations Department of Economic and Social Affairs, indicates that most adaptation to the likely climate change-related dangers over the next few decades fits well within a local development agenda. There needs to be a significant increase in development funding to help local governments adapt to climate change challenges.

Additional online resources

- **Climate Funds Update** is an independent website that provides information on the growing number of international funding initiatives designed to help developing countries address the challenges of climate change. www.climatefundsupdate.org
- **Climate Finance Options**, a joint initiative of UNDP and the World Bank, aims to provide comprehensive guidance on financial options available for climate action in developing countries. It includes information on where to access the wide range of funds available from multilateral and bilateral institution, as well as public and private sources. www.climatefinanceoptions.org/cfo
- **UN Secretary-General's High-level Advisory Group on Climate Change Financing (AGF)** was established on 12 February 2010 to develop practical proposals on how to scale-up long-term financing for mitigation and adaptation strategies in developing countries from various public as well as private sources. www.un.org/climatechange/agf
- **The European Capacity Building Initiative (ECBI)** aims to promote a more level playing field between government delegations to the international climate change negotiations, and to facilitate mutual understanding and trust, particularly with regards to climate finance. www.eurocapacity.org

- The UNDP's **African Adaptation Programme**, aims to assist 21 African countries in implementing integrated and comprehensive adaptation actions and resilience plans.
www.undp-aap.org
- **The Commission on Climate Change and Development (CCCD)** was established by the Government of Sweden in 2008 to develop proposals on how adaptation, risk reduction and climate-proof development can be effectively integrated into development and poverty reduction plans in developing countries with a particular focus on the ethical, human, institutional, and resource dimensions of adaptation.
www.ccdcommission.org
- **The Climate and Development Knowledge Network (CDKN)**, funded by the UK government, is designed to support developing countries in tackling the challenges posed by climate change.
<http://cdkn.org>
- **Global Environmental Change and Human Security (GECHS)** is a project of the International Human Dimensions Programme which situates environmental changes within the larger socioeconomic and political contexts that cause them, and which shape the capacity of communities to cope with and respond to change.
www.gechs.org
- **The World Bank's Social Dimensions of Climate Change programme** focuses on the equity dimensions of the climate change agenda within developing countries. It seeks to understand and address the distributional, poverty and social consequences of climate variability and change.
<http://go.worldbank.org/4NRYNHG1G0>
- **UN-HABITAT's Climate Change and Cities** programme works with local authorities around the world to enable direct access to global climate funds and to promote local solutions to respond to the impacts of climate change. www.unhabitat.org/categories.asp?catid=550
- **ICLEI - Local Governments for Sustainability** is an international association of local governments and national and regional local government organizations committed to sustainable development. ICLEI's programme on climate change focuses on the three pillars of mitigation, adaptation and advocacy.
www.iclei.org/index.php?id=800
- **The Asian Cities Climate Change Resilience Network (ACCCRN)** aims to catalyze attention, funding, and action on building climate change resilience for poor and vulnerable people by creating robust models and methodologies for assessing and addressing risk through active engagement and analysis of various cities.
www.rockefellerfoundation.org/what-we-do/current-work/developing-climate-change-resilience/asian-cities-climate-change-resilience

Adaptation response measures: policies and programmes

Introduction

For the most part, existing adaptation response measures maintain a sectoral and technical focus (e.g. water, infrastructure, agriculture etc.) and pay insufficient attention to indirect risks and impacts on vulnerability. Figure 2 below illustrates common types of adaptation activity as identified by research from the World Resources Institute (McGray, Hammil and Bradley, 2007). The following sections of this topic guide present a selection of emerging approaches which take a more nuanced view of vulnerability and target different social groups (see [vulnerability of different social groups](#)).

Figure 2: Top 10 strategies employed in a selection of 135 adaptation case studies

STRATEGY	DESCRIPTION
Changing Natural Resource Management Practices	Emphasizes new or different natural resource management practices (e.g., for managing water, land, protected areas, fisheries) as adaptation strategies.
Building Institutions	Creates new or strengthens existing institutions (e.g., establishing committees, identifying mechanisms for sharing information across institutional boundaries, training staff responsible for policy development).
Launching Planning Processes	Sets in motion a specific process for adaptation planning (e.g., developing a disaster preparedness plan, convening stakeholders around vulnerability assessment findings).
Raising Awareness	Raises stakeholder awareness of climate change, specific climate impacts, adaptation strategies, or the environment in general.
Promoting Technology Change	Promotes implementation or development of a technology new to the location (e.g., irrigation technology, communications technology).
Establishing Monitoring / Early Warning Systems	Emphasizes the importance of creating, implementing, and/or maintaining monitoring and/or early warning systems.
Changing Agricultural Practices	Focuses on new or different agricultural practices as adaptation strategies.
Empowering People	Emphasizes literacy, gender empowerment, or the creation of income generation opportunities as a basis for adaptation.
Promoting Policy Change	Promotes establishing a new policy or adjusting an existing policy.
Improving Infrastructure	Focuses on creating or improving built infrastructure (e.g., roads, sea walls, irrigation systems).

Adapted from McGray, Hammil and Bradley (2007)

GSDRC 2010, 'Climate Change, Empowerment and Accountability', Helpdesk Research Report, GSDRC, Birmingham
<http://www.gsdrc.org/go/display&type=Helpdesk&id=649>

This GSDRC helpdesk report looks at how climate change policies and programmes (particularly for adaptation) can best respond to the needs of the most vulnerable. The general consensus appears to be that this requires a combination of: a) greater investment in community-based adaptation, b) more decentralised planning, and d) stronger mechanisms to link community-level decision-making with national and international policy processes. Although strictly speaking beyond the remit of this report, it also includes resources on how to make the global funding architecture for climate change more accountable as well as a small selection of literature which looks at how social policies can support adaptation.

McGray, H., Hammil, A. and Bradley R., 2007, 'Weathering the Storm: Options for Framing Adaptation and Development', World Resources Institute, Washington DC

<http://www.gsdrc.org/go/display&type=Document&id=3912>

How can climate change adaptation and development become mutually reinforcing? This report reviews over a hundred case studies to explore the link between adaptation and development. It concludes that the relationship between the two concepts has never been properly articulated, resulting in missed opportunities for collaboration. Donors need to incorporate adaptive strategies into their development planning, particularly in fostering accountable decision-making processes and in reducing the vulnerability of populations to climate change impacts.

Jones, L., Jaspars, S., Pavanello, S., Ludi, E., Slater, R., Arnall, A., Grist, N. and Mtisi, S., 2010, 'Responding to a Changing Climate: Exploring How Disaster Risk Reduction, Social Protection and Livelihoods Approaches Promote Features of Adaptive Capacity', Working Paper 319, ODI, London

<http://www.gsdrc.org/go/display&type=Document&id=3923>

How can other humanitarian and development approaches help enhance communities' capacity to adapt to a changing climate? This paper examines which aspects of disaster risk reduction, social protection and livelihoods approaches can contribute to adaptive capacity and how these approaches can better respond to climate change and facilitate adaptation. While recognising that each approach has its distinct niche and strength, it argues that, as a collective, the three together can help in promoting certain features of adaptive capacity.

Global climate change poses unique and disproportionately large challenges for many small island developing states. The following document outlines key challenges and potential responses.

Maas, A., and Carius, A., 2011, 'Creating Space for Action: Options for Small Island States to Cope with Global Environmental Change', Migration and Global Environmental Change Foresight Project, Government Office for Science, London

<http://www.gsdrc.org/go/display&type=Document&id=4205>

This paper notes that climate change may create new pressures for small island states (such as severe ocean acidification) and intensify others (such as sea-level changes) in a comparatively short, yet unpredictable, amount of time. Internal relocation and migration is a tested adaptation practice for such states, which already have well-established migration links. However, with greater access to financial resources – by increasing the extent to which island states profit from fishing or mining concessions, for example – and by investing in people and knowledge, states can reduce the need for future relocation.

Social policies for adaptation: Social protection and risk transfer

It is increasingly recognised that a range of social policies are necessary, both to ensure that sectoral adaptation interventions are made more equitable, and to support poorer households and communities to cope with current and future weather extremes and manage climate risks. With regard to the latter, social protection – including asset and cash transfers, social pensions and employment guarantee schemes – is seen as holding significant promise given that it shares with adaptation the central objective of strengthening resilience to shocks and stresses. In order for social protection programmes to successfully address climate change impacts, it is recognised that they will need to focus on transforming rather than simply restoring livelihoods, take a longer-term perspective, address underlying issues of marginalisation and exclusion, and develop effective ways of targeting those most at risk of climate change impacts. The concept of adaptive social protection (see Arnall et al., 2010) is one recent attempt to construct a framework which incorporates some of these elements. This additional layer of complexity, however, presents significant political challenges, especially given the uncertainties associated with predicting climate change impacts. Nevertheless, an emphasis on shared equity and justice arguments for both adaptation and social protection interventions may strengthen the case for greater synergies between the two.

Risk transfer approaches, including index or weather insurance and disaster funds are also receiving increasing attention in the context of adaptation to climate change. These are advocated on the grounds that they can provide timely and predictable payouts following an extreme event, enable greater access to credit, technology and livelihoods inputs, incentivize risk reduction activities and provide space for longer-term development planning. However, a number of questions remain about the appropriateness, cost-effectiveness, and affordability of such measures and about how tools will deal with increasingly frequent and intense events on the one hand, and longer term, and more predictable risks such as sea-level rise and desertification on the other. Furthermore there are concerns about how effective these initiatives are at targeting the most vulnerable and about the level of community and civil society

participation and ownership. Crucially, for any risk transfer intervention to be successful it must be part of a broader framework which places the emphasis on disaster risk reduction through awareness raising, information dissemination and community participation (see [disaster risk reduction](#)).

Arnall, A., Oswald, K., Davies, M., Mitchell, T. and Coirolo, C., 2010, 'Adaptive Social Protection: Mapping the Evidence and Policy Context in the Agriculture Sector in South Asia', IDS Working paper 345, Institute of Development Studies, Brighton

<http://www.gsdrc.org/go/display&type=Document&id=3948>

The concept of Adaptive Social Protection (ASP) has been developed in an attempt to combine the three prominent approaches to vulnerability reduction – social protection (SP), disaster risk reduction (DRR) and climate change adaptation (CCA). This paper provides an initial assessment of the ways in which these elements are being brought together in development policy and practice. It does this through a meta-analysis of 124 agricultural programmes implemented in Afghanistan, Bangladesh, India, Nepal and Pakistan. The findings show that full integration of SP, DRR and CCA is relatively limited in south Asia, although there has been significant progress in combining SP and DRR in the last ten years.

GSDRC, 2008, 'Climate Change and Social Protection', Helpdesk Research Report, GSDRC, Birmingham

<http://www.gsdrc.org/go/display&type=Helpdesk&id=434>

This helpdesk report identifies the following as the primary coping strategies and protection measures of most relevance to climate change: Compensation mitigation measures, such as microinsurance and weather-risk crop insurance. In some cases, safety net approaches (e.g. public works, school feeding programmes) are linked to insurance payouts; Ex-ante adaptation measures, such as crop diversification (e.g. technical assistance, starter packs, seed fairs), irrigation systems, flood safe storage facilities, relocation, livelihood diversification and protection (e.g. legislated employment guarantees); Ex-post adaptation measures, such as cash transfers (e.g. unconditional cash payments, social pensions, child support grants), asset restocking/ sale of assets (e.g. 'meat aid' programmes, where the weakest animals are sold for cash), nutritional/feeding programmes.

Heltberg, R., Jorgensen, S. L., and Siegel, P. B., 2008, 'Climate Change, Human Vulnerability, and Social Risk Management', The Social Development Department, World Bank

<http://www.gsdrc.org/go/display&type=Document&id=3802>

How can interventions increase society's capacity to manage climate risks, reducing household vulnerability while maintaining or improving opportunities for development? This paper presents a social risk management and asset-based conceptual framework to help design such interventions. An integrated, multisectoral approach is needed to manage both direct and indirect climate risks. This requires greater collaboration among professionals working on disasters, climate change, and social policy, including shared platforms around definitions, data, monitoring, research, and capacity building. In terms of social protection, index-based insurance and combinations of insurance and safety net approaches hold promise, but the limits to what insurance can achieve need to be kept in mind.

Hellmuth, M.E., Osgood, D.E., Hess, U., Moorhead, A. and Bhojwani, H. (eds), 2009, 'Index Insurance and Climate Risk: Prospects for Development and Disaster Management', Climate and Society No. 2. International Research Institute for Climate and Society (IRI), Columbia University, New York

<http://www.gsdrc.org/go/display&type=Document&id=3885>

Variable and unpredictable climate can limit development and amplify poverty, particularly in the developing world. The potential of index insurance to help manage climate variability is being tested in a growing number of developing country settings. This report discusses this new type of insurance, presents case studies and outlines key lessons and recommendations. It finds that index insurance has provided access to credit and insurance for high-risk populations previously considered uninsurable, contributing to economic development and poverty reduction. It has also played a role in providing more timely and reliable disaster relief.

Suarez, P. and Linnerooth-Bayer, J., 2010, 'Micro Insurance for Local Adaptation', Wires Climate Change, Vol. 1 March/April, pp 271-278

<http://www.gsdrc.org/go/display&type=Document&id=3939>

How can micro-insurance programmes reduce developing countries' vulnerability to climate change? This paper examines a micro-insurance pilot project in Malawi. The project provides a loan guarantee that enables farmers to access higher-yield seeds. By raising productivity, it decreases their vulnerability to droughts. Findings also show that micro-insurance in Malawi can directly promote adaptation by actually reducing crop losses from drought. This is possible by incorporating into insurance pricing seasonal rainfall forecasts, which are strongly related to El Niño-Southern Oscillation (ENSO).

Godfrey Wood, R., 2011, 'Is there a Role for Cash Transfers in Climate Change Adaptation?', IDS Bulletin, vol. 42, no.6, pp.79-85

<http://www.gsdrc.org/go/display&type=Document&id=4244>

This article argues that cash transfers are likely to contribute to adaptive capacity by: (1) meeting basic needs; (2) helping the poor respond to climate-related shocks; (3) helping vulnerable households manage risk and consider investment innovations that increase their adaptive capacity; (4) transferring money for investment in long-term adaptive capacity development; and (5) facilitating mobility and livelihood transitions. While cash transfers cannot address all areas of adaptation, they may be necessary for further adaptation to be equitable and effective. Cash transfers are supported by a substantial evidence base, do not require much climate-related information, can be scaled up and are likely to gain local acceptance.

Community-based adaptation and livelihood support

Community-based adaptation (CBA) is an emerging bottom-up approach to climate change adaptation based on the priorities, experiences, knowledge and capacities of local people. It draws on participatory approaches developed in both [disaster risk reduction](#) and community development work. The focus of CBA is on empowering communities to take action themselves based on existing vulnerabilities, coping strategies and decision-making processes. Whilst, in practice, CBA projects may not appear to differ greatly from mainstream development projects, CBA aims to factor in the potential impact of climate change on livelihoods and vulnerability to disasters by combining local and scientific knowledge.

Both the theory and practice of CBA are still relatively new. As the large number of CBA pilot projects is evaluated, lessons are emerging about what does and doesn't work and where improvements need to be made. Criticisms include the fact that projects to date have often advanced livelihood diversification strategies without proper consideration of the range of strategies available or the socio-political context, and have not given sufficient attention to disaggregating poverty and vulnerability within communities and hence to tailoring adaptation measures appropriately. In this respect it has been suggested that CBA can learn a great deal from the wealth of existing knowledge on sustainable livelihoods, development and rural poverty.

Other challenges relate to the availability and credibility of climate change information and data at the community level, the quality of participatory processes in CBA, the concept of 'community', and the inherent tension between devolved decision-making and the need for centralised monitoring and evaluation in the context of global adaptation funding. Furthermore, it is increasingly recognised that CBA interventions need to be placed within broader efforts to strengthen institutions and create an enabling environment for local enterprise development and access to information, credit, land, health care and education.

Reid, H., Alam, M., Berger, R., Cannon, T., Huq, S., and Milligan, A., 2009, 'Community-based Adaptation to Climate Change: An Overview' Chapter 1 in Community-based Adaptation to Climate Change', Participatory Learning and Action (PLA) series, no. 60, International Institute for Environment and Development, London

<http://www.gsdrc.org/go/display&type=Document&id=3935>

What are the lessons and challenges emerging from community-based approaches (CBA) to climate change adaptation? This paper examines community-led processes that build on the priorities, knowledge and capacities of local people. There is still a lot of 'doing to' by international institutions rather than communities taking charge. It is important to find ways to allow poor vulnerable people to influence policy and be heard in key policy arenas. For example, programmes should link communities to relevant decision-making bodies. They will also need to build the capacity of local organisations to enable them to take part effectively in decision-making processes.

Ensor, J. and Berger, R., 2009, 'Community-based Adaptation in Practice', Chapter 10 in Understanding Climate Change Adaptation. Lessons from Community-Based Approaches', Practical Action Publishing

<http://www.gsdrc.org/go/display&type=Document&id=3899>

How can local communities best be supported to adapt to climate change? How can an enabling policy context be established in order to scale-up adaptation? This chapter assesses community-based approaches to climate change adaptation in Asia, Africa and Latin America. It finds that vulnerability to climate change is linked to the ability to access and control resources and to the opportunity and skills to influence decisions that affect people's livelihoods. The principal threat to creating communities that can adapt successfully to climate change is institutional and political

marginalisation; Governance and policy frameworks must be transformed in order to address exclusion.

Sabates-Wheeler, R., Mitchell, T. and Ellis, F., 2008, 'Avoiding Repetition: Time for CBA to Engage with the Livelihoods Literature?', IDS Bulletin vol. 39, no. 4

<http://www.gsdrc.org/go/display&type=Document&id=3951>

What can the community-based adaptation (CBA) approach learn from the well-established livelihoods literature? How can repetition of research and projects be minimised? The overlap of CBA with the livelihoods, development and rural poverty literatures provides opportunities for CBA to nuance its overly-simplistic approach to conceptualising and implementing sustainable social and economic development. Synergies must be found that maximise both the productivity of livelihoods and the ecological sustainability of the community; CBA and livelihoods researchers and practitioners need to work together. Social protection and enabling environments seem promising avenues to explore.

For guidance on implementing community-based adaptation, see [project-level adaptation tools](#).

Disaster risk reduction

The United Nations International Strategy for Disaster Reduction (UNISDR) defines disaster risk reduction (DRR) as: “the concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events” (UNISDR, 2009, 'UNISDR Terminology on Disaster Risk Reduction').

At its core, DRR shares with climate change adaptation the aim of reducing the impacts of shocks by anticipating risks and addressing vulnerabilities. However, there are also a number of important differences. Most significantly, adaptation considers long-term changes in average climatic conditions, whereas DRR focuses on extremes. Unlike adaptation, DRR also encompasses geophysical risks (e.g. volcanoes and earthquakes). Furthermore, whereas adaptation responses are based on projections of future impacts rooted in climate science, DRR builds primarily on past experience and existing local knowledge. Finally, because the global policy framework for climate change is far stronger, adaptation tends to command higher political interest and hence larger funding streams.

Nevertheless, it is increasingly recognised that there are important benefits to be gained from greater collaboration between the two fields. These include the potential for a reduction of climate-related losses through more widespread implementation of DRR measures, more efficient use of limited resources, and increased effectiveness and sustainability of both adaptation and DRR approaches. More specifically, the range of DRR methods and tools which already exist to predict weather related hazards and to assess risks based on the vulnerability of different social groups, social-ecological systems and infrastructure are highly relevant for adaptation to more frequent extreme events. At the same time, greater awareness of the longer term impacts of climate change has led to the recognition that the objectives of DRR need to go beyond restoring communities affected by disasters to their pre-disaster condition and to focus instead on the opportunities that disasters provide to create long-term resilience.

There are, nevertheless, a number of institutional challenges to greater integration and collaboration which need to be overcome, including: the large number of different actors involved in both DRR and adaptation, the tension between short-term funding for DRR and long-term financial support needed for adaptation, limited capacity to predict extreme events linked to climate change, and a limited understanding of how disaster response measures affect the long-term adaptive capacity of communities.

Birkmann, J., Tetzlaff, G. and Zentel, K-O., 2009, 'Addressing the Challenge: Recommendations and Quality Criteria for Linking Disaster Risk Reduction and Adaptation to Climate Change', German Committee for Disaster Reduction (DKKV), Bonn

<http://www.gsdrc.org/go/display&type=Document&id=3940>

How can the international community accelerate progress on climate change adaptation while ensuring sustainable development? This report argues that the increasing frequency and intensity of extreme weather events requires the proactive implementation of new tools to accelerate climate change adaptation. Disaster risk reduction methods should be linked with adaptation strategies to provide affected regions with the capacity and funding both to recover from extreme weather events and to create long-term resilience and sustainable development.

Mitchell, T. , van Aalst, A. and Villanueva, P.S., 2010, 'Assessing Progress on Integrating Disaster Risk Reduction and Climate Change Adaptation in Development Processes', Strengthening Climate Resilience Discussion Paper 2, Institute of Development Studies, Brighton

<http://www.gsdrc.org/go/display&type=Document&id=3879>

What progress has been made in the convergence of disaster risk reduction (DRR) and climate change adaptation (CCA)? What are the obstacles to further integration? This assessment identifies pockets and trajectories of integration that promise improved development outcomes. However, it also finds continued separation of DRR, CCA and development in some geographic areas and significant structural barriers to convergence in critical institutions at different scales.

Mercer, J., 2010, 'Disaster Risk Reduction or Climate Change Adaptation: Are We Reinventing the Wheel?', Journal of International Development, vol. 22, no. 2, pp. 247–264

<http://www.gsdrc.org/go/display&type=Document&id=3967>

What are the similarities and differences between Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA)? What can be learned from experiences of both approaches in Papua New Guinea (PNG)? This paper analyses the two approaches and draws on experience from PNG in recommending ways to integrate both in development policy. The research demonstrates the importance of a holistic response to all underlying vulnerability factors, as opposed to focusing on one hazard or factor such as climate change. It would appear most effective, financially and otherwise, to embed CCA within existing DRR tools. This is as opposed to developing tools and methodologies for CCA separately and integrating these with DRR at a later date.

Gero, A., Méheux, K., Dominey-Howes, D., 2010, 'Disaster Risk Reduction and Climate Change Adaptation in the Pacific: The Challenge of Integration', Australian Tsunami Research Centre & Natural Hazards Research Laboratory, Sydney

<http://www.gsdrc.org/go/display&type=Document&id=3960>

What are the challenges in integrating community-based disaster risk reduction (DRR) and climate change adaptation (CCA)? This research investigates the current situation and thinking on integrating DRR and CCA in community based projects in the Pacific. A key finding is the importance of agency and the significance of building and maintaining good relationships between DRR and CCA practitioners across sectors, including the government, NGOs and donors. A common barrier to integrating DRR and CCA is the multitude of organisations engaged in related initiatives.

Wilkinson, E., 2012, 'Transforming Disaster Risk Management: A Political Economy Approach', ODI Background Note Series, Overseas Development Institute, London

<http://www.gsdrc.org/go/display&type=Document&id=4248>

This paper examines recent work by disaster researchers on the complex role of institutional arrangements in shaping policy decisions. It identifies incentive structures, information gaps and intra-governmental relations as key factors affecting the decisions of national and local authorities. It recommends more interdisciplinary research on political processes and policy change to develop a clearer theoretical focus for Disaster Risk Management, so as to help promote the necessary institutional transformation.

For guidance on implementing DRR programmes, see [project-level adaptation tools](#).

Ecosystem-based adaptation

Ecosystem-based adaptation involves the sustainable management, conservation and restoration of ecosystems and the habitats, natural resources, and services they provide to help people adapt to the adverse impacts of climate change. Examples of ecosystem-based adaptation strategies include: managing water resources for water storage and flood regulation; restoring coastal habitats as a natural defence against storm-surges, saline intrusion and coastal erosion; managing grasslands to increase resilience to drought and flooding; using indigenous knowledge to maintain the diversity of agricultural systems, crops and livestock in changing local climatic conditions; and managing shrublands and forests to limit the frequency and size of uncontrolled fires.

Ecosystem-based adaptation is often advanced as a cost-effective alternative to physical engineering structures and is seen as closely aligned with the principles and objectives of [community-based adaptation](#). Local participation in planning and implementation is key to the success of the approach, as is collaboration between a broad range of stakeholders including indigenous communities, conservationists, natural resource managers, the private sector, and development and humanitarian specialists.

World Bank, 2010, 'Ecosystem-Based Adaptation: Reducing Vulnerability', Chapter 3 in Convenient Solutions to an Inconvenient Truth. Ecosystem-Based Approaches to Climate Change, World Bank, Washington DC

<http://www.gsdr.org/go/display&type=Document&id=3880>

How can ecosystem-based adaptation help societies to cope with climate change challenges? This paper contends that ecological stresses such as land degradation and decreases in biodiversity exacerbate the vulnerability of certain populations to the impact of climate change. Societies (particularly in developing countries) must invest in preserving and restoring local ecosystems to act as natural barriers against extreme weather events and climate conditions. Ecosystem-based approaches are low-cost, long-proven, and low-technology solutions to many anticipated climate change impacts. They can complement existing adaptation efforts, and better engage local communities in protecting their environments.

Secretariat of the Convention on Biological Diversity, 2009, 'The Linkages between Biodiversity and Climate Change Adaptation', Chapter 2 in Review of the Literature on the Links between Biodiversity and Climate Change – Impacts, Adaptation and Mitigation, CBD Technical Series No. 42, CBD Secretariat, Montreal

<http://www.gsdr.org/go/display&type=Document&id=3928>

What is the role of biodiversity in climate change adaptation? How can the impacts of climate change be mitigated without adversely affecting biodiversity? Adaptation strategies tend to focus on technological, social and economic developments. They overlook the links between biodiversity and adaptation. There needs to be greater consideration of synergies between the two in adaptation policy and planning. Most importantly, there needs to be improved understanding of the underpinning role of biodiversity to avoid maladaptation and to develop cost-effective responses to climate change.

REDD-net, 2010, 'REDD+ and Adaptation to Climate Change', REDD-net, ODI, London

<http://redd-net.org/files/REDD%20and%20adaptation.pdf>

REDD stands for 'reducing emissions from deforestation and degradation', and is an important element of global policies to address climate change. 'REDD+' is similar to REDD, but includes other activities, such as the sustainable management of forests and the enhancement of forest carbon stocks. This infosheet gives an overview the links between REDD+ and adaptation. It describes how some of the linkages between the two issues are being understood, some of the opportunities and risks, and highlights further information sources on the issue.

Attempts to embed the long-term economic benefits of ecosystem services within broader economic models and decision making have generated interest in 'Payment for Environmental Services' (PES) programmes. These incorporate the regulating and provisioning functions of ecosystems into decision-making processes.

Wertz-Kanounnikoff, S. et al., 2011, 'Ecosystem-based Adaptation to Climate Change: What Scope for Environmental Services?', *Climate and Development*, vol. 3, no. 2, pp.143-158

<http://www.gsdr.org/go/display&type=Document&id=4206>

This article analyses the opportunities and constraints of payments for environmental services (PES) as an instrument for ecosystem-based adaptation. It finds that PES is not suitable for all environmental services and country contexts, but can be a promising adaptation policy instrument where certain preconditions are met and synergies prevail.

Low carbon and climate resilient development

Low-carbon development (LCD), sometimes referred to as low carbon growth, broadly refers to efforts to decouple greenhouse gas (GHG) emissions from economic growth. It encompasses a range of actions which aim to reduce emissions through changes in both production and consumption patterns. To date the focus of LCD has been on high and middle income countries. However, it is increasingly recognised that without action from the developing world, efforts to limit global temperature change to less than 2°C will be ineffective. From a development perspective, a key concern is to understand the distributional effects of LCD strategies and how they will impact on the poor.

There is also some concern over the limited attention that has been paid to the linkages between LCD and adaptation. In this context, attention is now shifting towards climate resilient growth, broadly defined as patterns of development that help build an economy's resilience in a future changing climate. There is still a limited understanding of what climate resilient development might involve in practice however, although key elements are likely to include shifts away from climate sensitive sectors such as agriculture and better long-term planning and policy to reduce vulnerability. Furthermore, it is unclear to what extent low carbon growth and climate resilient growth require similar policies or whether they will involve conflicts and trade-offs.

Pye, S., Watkiss, P., Savage, M. and Blyth, W., 2010, 'The Economics of Low Carbon, Climate Resilient Patterns of Growth in Developing Countries: A Review of the Evidence,' Report to DFID, Stockholm Environment Institute, Stockholm

<http://www.gsdrc.org/go/display&type=Document&id=3894>

To what extent can developing countries move towards low carbon growth without compromising economic development? This study reviews the literature on the economics of climate change. It finds that all countries need to act decisively in order to reduce emissions, and that preventing economic growth targets from increasing emissions will require significant additional investment. However, these extra costs may not be prohibitive, and low carbon patterns of growth may offer opportunities for developing countries. These include improving efficiency and lowering energy costs, developing low carbon industries, improving technology, raising carbon finance through international mechanisms and safeguarding natural resources.

Urban, F., 2010, 'The MDGs and Beyond: Can Low Carbon Development be Pro-poor?', IDS Bulletin 41:1

<http://www.gsdrc.org/go/display&type=Document&id=3875>

Can low carbon development be pro-poor? This article explores several policy responses to the Low Carbon Development (LCD) debate and analyses how pro-poor they are. It argues that poverty reduction must be linked to LCD as part of a post-2015 Millennium Development Goal agenda. There is no explicit pro-poor concern or consideration of equity in the current LCD debate.

Ellis, K. et al., 2010, 'Growth in a Carbon Constrained Global Economy,' ODI, London

<http://www.gsdrc.org/go/display&type=Document&id=3970>

How will the economies of developing countries be affected by efforts to deal with climate change? This report examines the impact of international mitigation policies on economic opportunities in developing countries. Greater understanding of the impacts of different mitigation policies on developing countries is needed to inform the decision-making of developed country policymakers'. More importantly, such understanding can help developing countries to start taking advantage of new opportunities and to protect themselves from new risks arising from mitigation. Donors need to increase support for developing countries' low carbon growth efforts, and compensate countries where they lose out from international mitigation efforts.

UNDP, 2009, 'Charting a New Low-Carbon Route to Development', A Primer on Integrated Climate Change Planning for Regional Governments, United Nations Development Programme, New York

<http://www.gsdrc.org/go/display&type=Document&id=3920>

How can sub-national governments incorporate climate change into their planning? This Primer argues for systematic action across all levels of long-term development planning and cross-sectoral implementation (regional, national, sub-national and local). It introduces approaches to help sub-national authorities design an Integrated Territorial Climate Plan (ITCP), from setting objectives and participatory arrangements for the preparation of the Plan, to financing priority activities. Meeting the challenge of climate change will require the full engagement of regional and local governments, and the formulation of innovative policy development and planning instruments. Comprehensive partnerships and strong coordination mechanisms will be needed.

Additional online resources

- The **Adaptive Social Protection (ASP)** programme at the Institute of Development Studies is developing an approach that combines key elements of social protection, disaster risk reduction and climate change adaptation to increase livelihoods resilience.
www.eldis.org/go/topics/resource-guides/climate-change/key-issues/adaptive-social-protection
- The **Munich Climate Insurance Initiative (MCII)** brings together insurers, climate change and adaptation experts, NGOs, and policy researchers to share insurance-related expertise applied to climate change issues.
www.climate-insurance.org
- The **Community Based Adaptation Exchange (CBA-X)** provides a site for the exchange of up-to-date information about community-based adaptation, including case-studies, tools, and policy resources.
<http://community.eldis.org/cbax>
- The **United Nations International Strategy for Disaster Reduction (UNISDR)** is the secretariat of the ISDR system, a strategic framework, adopted by UN Member States in 2000 to guide and coordinate the efforts to

achieve substantive reduction in disaster losses and build resilient nations and communities. UNISDR serves as the focal point for the implementation of the [Hyogo Framework for Action \(HFA\)](#) – a ten year plan of action adopted in 2005 by 168 governments to protect lives and livelihoods against disasters.

www.unisdr.org

- **ProVention** is a consortium of international organisations, governments, the private sector, civil society organisations and academic institutions working on disaster risk reduction.
www.proventionconsortium.org
- The **International Union for Conservation of Nature's (IUCN)** programme on Ecosystem-based Adaptation (EbA) works to promote the inclusion of EbA in relevant national plans and policies related to adaptation and in the Adaptation Framework being discussed under the UNFCCC.
www.iucn.org/what/tpas/climate/key_topics/eba

Climate change, conflict, migration and fragility

Climate change, security and conflict

The potential impacts of climate change on security and conflict have received a great deal of media attention and are generally described in terms of the following causal processes or scenarios:

- Climate change leads to resource scarcity (in particular, water and productive land) and undermines rural livelihoods. The resulting increase in competition over resources leads to violent conflict.
- Greater scarcity of resources and an increase in the frequency and intensity of extreme events leads resource dependent people to migrate, destabilising neighbouring areas and increasing the risk of conflict (see [climate change and migration](#)).
- Indirectly, climate change hinders the ability of governments to provide infrastructure, basic services and social safety nets, weakening the social contract which leads to greater insecurity and unrest, especially in weak governance environments (see [adaptation in fragile and conflict-affected states](#)).

In reality, these linkages are poorly understood and rarely backed up with empirical evidence. The number of dependent variables makes any simple causal relationship untenable: Firstly, accurate climate projections are difficult to make, especially at the local level; Secondly, adaptive capacities vary greatly between and among communities; Thirdly, the processes that produce insecurity and lead to violent conflict are themselves complex and highly context specific (see the [GSDRC topic guide on conflict](#)). Thus while climate change may play a role in conflict, it is highly unlikely to be the sole or even the primary cause. Indeed in some cases environmental stresses may have the opposite effect of fostering collaboration, as evidenced by examples of trans-boundary cooperation around access to water.

Thus, the narrative around climate change security and conflict is highly contested and there has been much criticism of the so-called securitization of the climate change debate. Most significantly, where vulnerability to climate change in developing countries is portrayed as a risk to the national security of northern states, military solutions are often implied where priority is given to defence and immigration control, at the expense of adaptation responses and existing development interventions.

Barnett, J. and Adger, W. N., 2007, 'Climate Change, Human Security and Violent Conflict', *Political Geography*, vol. 26, no. 6, pp. 639-655

<http://www.gsdrc.org/go/display&type=Document&id=3409>

Does climate change increase the risk of violent conflict? This paper from *Political Geography* integrates three bodies of research on the vulnerability of local places and social groups to climate change, livelihoods and violent conflict, and the role of the state in development and peacemaking. Climate change reduces access to natural resources and undermines state capacity to help people sustain livelihoods. These impacts may in certain circumstances increase the risk of violent conflict, but further investigation is needed.

GSDRC, 2007, 'Climate Change and Conflict', Helpdesk Research Report, GSDRC, Birmingham

<http://www.gsdrc.org/go/display&type=Helpdesk&id=348>

There is little academic research on the links between climate change and conflict. Of the few studies that are available, the findings are mixed. Most authors argue that whilst climate change may well result in increased conflict, this path is not certain. The most commonly discussed scenarios are that climate change causes resource scarcity, which prompts violent conflict, or that resource scarcity results in migration which leads to conflict in the receiving area. Of the papers that do find a clear link between climate and conflict, climate change appears to be one factor contributing to conflict, not necessarily a leading or important factor.

Brown, O., Hammill, A. and McLeman, R., 2007, 'Climate Change as the 'New' Security Threat: Implications for Africa', *International Affairs* vol. 83, no. 6

<http://www.gsdrc.org/go/display&type=Document&id=3972>

What are the implications for Africa of the 'securitisation' of climate change? This article examines the international rhetoric linking climate change and security, focusing on its predictions regarding the stability of African states. It argues that the extent to which climate change triggers war will depend largely on governance and governments. Using

projections of climate change in isolation from other factors is therefore an inadequate means of predicting future conflict. Meanwhile, the securitisation of the climate change debate (displacing focus on developmental or environmental consequences) presents both risks and opportunities. Viewing climate change principally as a security problem is likely to be less effective than incorporating adaptation into existing development processes.

Shubert, R. et al., 2008, 'Climate Change as a Security Risk', German Advisory Council on Global Change (WBGU), Earthscan, London/Sterling

<http://www.gsdr.org/go/display&type=Document&id=3897>

To what extent is climate change a threat to international security? This report examines the evidence and analysis to date. It suggests that without resolute action, climate change will overstretch many societies' adaptive capacities. This could result in destabilisation and violence, jeopardising national and international security. In order to avoid these developments, an ambitious global climate policy must be put into operation over the next 10-15 years.

Buhaug, H., 2010, 'Climate Not to Blame for African Civil Wars', Proceedings of the National Academy of Sciences of the United States of America (PNAS), August

<http://www.gsdr.org/go/display&type=Document&id=3946>

Will global warming increase the severity and number of civil wars in Africa? This paper analyses the links and correlation between climate change, climate shocks and intrastate violence in Africa. It finds that, while environmental conditions may not be irrelevant to conflict risk, scientific claims about a robust correlation between climate change and the risk of civil war in Sub-Saharan Africa do not hold up. The primary causes of civil wars are political, not environmental. Environmental conditions may change with future warming, but general correlates of conflicts and wars are likely to prevail.

Mwiturubani, D. A. and van Wyk, J-A., 2010, 'Climate Change and Natural Resources Conflicts in Africa, Monograph 170, Institute for Security Studies, Pretoria

<http://www.issafrica.org/uploads/Mono170.pdf>

This monograph encompasses papers from different disciplines and draws case studies from across Africa. It covers a range of issues relating to vulnerabilities, adaptation and mitigation of climate change and conflict management.

Recent analysis undertaken as part of a UK government Foresight study into climate change and future migration lend weight to the argument that the relationship between environmental change and conflict is not strictly causal. The researchers conclude that, while qualitative evidence generally affirms the notion that environmental change can – under some circumstances – increase the risk of conflict, quantitative analysis suggests it does not do so systematically.

Bernauer, T., Koubil, V., and Bohmelt, T., 2011, 'Environmental Changes and Violent Conflict', Foresight Project: Migration and Global Environmental Change, The Government Office for Science, London

<http://www.bis.gov.uk/assets/bispartners/foresight/docs/migration/science-reviews/11-1131-sr12-environmental-changes-and-violent-conflict.pdf>

Climate change and migration

Estimates of future climate change induced migration range from 25 to 200 million by 2050. However, these figures are widely contested, given that migration is known to be a complex process with multiple drivers of which environmental factors, including climate change, are but one. A range of other social, political and environmental factors play an equally, if not more, important role in shaping patterns of migration, including social exclusion, formal and informal institutions, population growth, inter-community tensions, natural resource management, poverty and power.

Nevertheless, there is a growing body of work which attempts to better understand the role of climate change in migration decision-making processes. According to this research, the character of climate change related migration is expected to differ considerably from region to region (e.g. low lying island states vs arid regions). Those aspects of climate variability most likely to affect migration are the ones which impact on environmentally based livelihoods, in particular the availability and reliability of water resources. Most displacement as a result of climate change is expected to take place within national borders rather than in the form of interregional (south-north) migration, and is expected to be rural-urban. Initially the bulk of population movement is expected to be disaster driven. Longer term changes in conditions may result in longer term displacements, for example, in situations where either the environment is no longer able to promote return or where other vulnerabilities (extreme poverty, social trends etc) make return impossible.

Focusing on sustainable ecosystems, adaptation and disaster-risk reduction in developing countries is often seen as key to minimising the 'push' factor of climate change. However, it is important to recognise that migration itself can be an important adaptive strategy to reduce vulnerability to both environmental and non-environmental risks. Crucially, those most vulnerable to both climate change and forced migration have the least resources to undertake long-distance migration, so are often left behind. Relocation or resettlement as a response to climate related natural disasters may be necessary in some exceptional cases but it is essential to consider the risks involved such as loss of livelihoods, debt, social exclusion and potential resentment and conflict in the receiving area.

The Government Office for Science, 2011, 'Foresight: Migration and Global Environmental Change - Future Challenges and Opportunities', Final Project Report, The Government Office for Science, London

<http://www.gsdrc.org/go/display&type=Document&id=4204>

How might human population movements across the world be affected by global environmental changes up to 2060? This report examines both global and within-country migration trends. It finds that: millions will be 'trapped' in vulnerable areas and unable to move; people are as likely to move towards areas of environmental risk as to move away; however, migration can transform people's ability to cope with environmental change.

Laczko F, Aghazarm C. (eds.), 2009, 'Migration, Environment and Climate Change: Assessing the Evidence', International Organization for Migration (IOM), Geneva

<http://www.gsdrc.org/go/display&type=Document&id=3874>

How is environmental change affecting migration and how can policymakers address this emerging challenge? The book assesses the existing body of evidence relating to the likely impact of environmental and climate change on migration. It recommends that the focus of research and funding shift toward developing countries where migration, both internal and international, is most likely to occur. It also advocates for better data collection through collaboration of experts from the migration, environment, development and humanitarian fields.

Black, R. et al., 2008, 'Demographics and Climate Change: Future Trends and their Policy Implications for Migration', Development Research Centre on Migration, Globalisation and Poverty, University of Sussex, Brighton

<http://www.gsdrc.org/go/display&type=Document&id=3934>

This paper explores the potential impact of future demographic and climate change on migration patterns in developing countries. It argues that policymakers should not seek to prevent migration resulting from climate change: some migration impacts from existing emissions are likely to be unavoidable, and migration itself can have both positive and negative effects. Rather, policies are needed to support: a) pro-poor adaptation; and b) people who will migrate at least partly as a result of climate change.

Warner, K., Ehrhart, C., de Sherbinin, A., Adamo, S. and Chai-Onn, T., 2009, 'In Search of Shelter. Mapping the Effects of Climate Change on Human Migration and Displacement', Care International, Chatelaine, Switzerland

<http://www.gsdrc.org/go/display&type=Document&id=3905>

To what extent is climate change causing – and is likely to cause – the displacement and migration of people around the world? How should policymakers respond? This report draws on empirical evidence from a first-time, multi-continent survey of environmental change and migration. It argues that climate-related migration and displacement can be successfully addressed only if they are seen as global processes rather than local crises. The principle of common but differentiated responsibilities must underlie policy negotiations and subsequent outcomes.

Tacoli, C., 2009, 'Crisis or Adaptation? Migration and Climate Change in a Context of High Mobility', prepared for Expert Group Meeting: Population Dynamics and Climate Change, UNFPA and IIED, London, 24-25 June

<http://www.gsdrc.org/go/display&type=Document&id=3932>

This paper argues that migration can be an adaptive strategy. There is growing evidence to suggest that mobility, together with income diversification, is important in reducing vulnerability to both environmental and non-environmental risks. Short-term urban migration is already often used as a means of broadening income in times of agricultural shortage. Supporting migration to small, intermediate urban centres is likely to become increasingly important in adapting to climate change. Local and national institutions urgently need to foster a positive perspective of migration. Rather than seeking to influence the volume, direction and types of population movement, migration policies might more usefully aim to accommodate changes in migration patterns.

GSDRC, 2009, 'Climate Change and Migration', Helpdesk Research Report, GSDRC, Birmingham

<http://www.gsdrc.org/go/display&type=Helpdesk&id=523>

Methodologically, it is very difficult if not impossible to unpack the different environmental drivers and triggers of migration. Empirical research does not support the claim that climate change will trigger waves of South-North

interregional migration. The extent to which new migratory trends are likely to emerge as a result of climate change is also unclear. Some argue that, as a 'threat-multiplier', climate change is more likely to exacerbate existing problems. Others argue that new trends are likely to emerge (e.g. Alaska, Pacific islands) but there is currently only limited case study evidence for this.

Adaptation in fragile and conflict-affected states

Fragile states, where the state is unable or unwilling to perform functions necessary to meet citizens' basic needs and expectations, pose particular challenges for efforts to adapt to climate change. In such contexts, vulnerability is often compounded by extreme poverty, poor infrastructure, limited access to markets, weak institutions, political instability and the threat of violence. State fragility means that there is little or no social safety net to support the most vulnerable to cope with climate impacts. Given that fragile states already struggle to maintain control and legitimacy in current conditions, the social and economic impacts of climate change are likely to generate demands which they will be unable to meet and may be overwhelmed by. Fragile states also present challenges for channelling and disbursing adaptation finance given their already limited absorptive capacity and the potential for elite capture and corruption. Learning from the experience of the development community with regards to aid effectiveness in fragile states is seen as an essential starting point (see [aid effectiveness in fragile contexts](#) in the GSDRC Fragile States topic guide).

Given these added complexities, there are increasing calls for a better understanding of the links between conflict prevention, peacebuilding and adaptation in fragile states. This would involve steps to ensure adaptation processes and policies are conflict-sensitive and 'do no harm' (through e.g. broad-based participation, taking account of issues of power distribution and existing social tensions). At the same time, it could also mean climate-proofing peacebuilding initiatives (by e.g. conducting climate change impact assessments of post-conflict reconstruction and reintegration programmes). A further consideration is to better plan for and peacefully cope with climate-related migration (see [climate change and migration](#)). These approaches are relatively new however, and there remains little guidance on integrating conflict-sensitive approaches into adaptation programmes and no reference to conflict-prevention or peacebuilding in adaptation frameworks or policy.

Others call for a more nuanced approach based on empirical context-specific political analysis. Given that adaptation itself is highly a political process which involves struggles and power relations, this perspective cautions against the simplistic assumption that adaptation interventions can necessarily contribute to peacebuilding objectives through cooperation around shared goals and interests.

GSDRC, 2008, 'Climate Change and State Fragility', Helpdesk Research Report, GSDRC, Birmingham

www.gsdrc.org/go/display&type=Helpdesk&id=458

There is very little literature available that explicitly discusses the interplay between climate change and state fragility. The general assumption is that the social and economic impacts of climate change are likely to generate demands which they will be unable to meet and may be overwhelmed by. One of the key factors upon which the vulnerability of people to climate change depends is the extent to which they can adapt to changes to the climate sensitive resources and services that they rely upon. This ability to adapt is based on a broad range of social factors, including poverty, support from the state, access to economic opportunities, the effectiveness of decision making processes, and the extent of social cohesion within and surrounding vulnerable groups. These factors are all linked to the state's capacity to provide services and maintain institutions, which is often lacking in fragile states.

Smith, D., and Vivenkananda, J., 2009, 'Climate Change, Conflict and Fragility: Understanding the Linkages, Shaping Effective Responses', International Alert, London

<http://www.gsdrc.org/go/display&type=Document&id=3776>

What effect will climate change have on violent conflict? This report argues that climate change is most likely to provoke conflict in poor, badly governed countries with a recent history of violent conflict. Adaptation policies must respond to the links between climate change, state fragility and conflict, and must begin by focusing on as local a level as possible. Further, a large-scale systematic study is needed of the likely costs of adaptation. This should address the social and political dimensions as well as economic sectors.

UNEP, 2009, 'From Conflict to Peacebuilding: The Role of Natural Resources and the Environment', United Nations Environment Programme, Nairobi

<http://www.gsdrc.org/go/display&type=Document&id=3462>

Conflicts associated with natural resources are twice as likely to relapse into violent conflict. Yet, less than a quarter of

peace negotiations for conflicts linked to natural resources have addressed resource management mechanisms. This study from the United Nations Environment Programme argues that the recognition of the contribution of environmental issues to violent conflict underscores their potential as pathways for cooperation and the consolidation of peace. Integrating environment and natural resources into peacebuilding strategies is now a security imperative.

Wijeyaratne, S., 2009, 'Fragile Environment, Fragile State: What Role for Conflict-Sensitivity and Peace-Building?' A Discussion Paper, Prepared For The CCIC Policy Roundtable: Reclaiming The Commons: Promoting A North-South Agenda For Environmental Justice, January 14, Canadian Council For International Co-Operation, Ontario

<http://www.gsdr.org/go/display&type=Document&id=3915>

What are the links between environmental injustice and violent conflict? How could climate change affect conflict-prone fragile states? This paper notes that unfair levels of access to natural resources (such as land and water) can contribute to poverty, marginalisation, and violent conflict. Linking adaptation and conflict-sensitive and peacebuilding agendas in conflict-prone fragile states can help to ensure that the rights of those most adversely affected by climate change are protected. The integration of conflict-sensitive and peacebuilding approaches into climate change adaptation strategies is required.

Lind, J., Ibrahim, M. and Harris, K., 2010, 'Climate Change and Conflict: Moving Beyond the Impasse', IDS In Focus Policy Briefing 15, Institute of Development Studies, Brighton

<http://www.gsdr.org/go/display&type=Document&id=3918>

What is the connection between climate change and conflict? This study suggests that the desire to identify a clear causal path between climate change and conflict overlooks the complexity of both phenomena; it is important to take a more nuanced view of climate change and to understand better the causes of conflict. The multifaceted nature of climate change reduces the effectiveness of using predictive modelling to frame policy. Instead, empirical analysis is needed of particular contexts of conflict and collaboration in a changing climate.

Additional online resources

- The International Institute for Sustainable Development's (IISD) research programme on **Environment, Conflict and Peacebuilding** addresses the links between environmental change, natural resources and security. www.iisd.org/ecp
- The **Institute for Environmental Security (IES)** is an international non-profit non-governmental organisation which works to increase political attention to environmental security as a means to help safeguard essential conditions for peace and sustainable development. www.envirosecurity.org
- The Woodrow Wilson Center's **Environmental Change and Security Program (ECSP)** explores the connections between environmental, health, and population dynamics and their links to conflict, human insecurity, and foreign policy. The Program also maintains the **New Security Beat blog**. www.wilsoncenter.org/ecsp
- The **Climate Change, Environment and Migration Alliance (CEMA)** is a multi-stakeholder global partnership which brings together actors representing a range of perspectives including environment, migration, development and humanitarian assistance. www.ccema-portal.org

Monitoring and evaluating adaptation

How to measure successful adaptation?

Measuring the effectiveness of adaptation projects, programmes, policies and national systems is inherently complex. To begin with, there remains a great deal of conceptual uncertainty about what to measure (adaptive capacity, resilience, vulnerability reduction etc.). Adaptation interventions tend to cut across many sectors, are implemented at different scales (from international to household level), over different timescales, and take a broad range of approaches (from hard structural adaptation measures, e.g. infrastructure and technological projects, to soft policy measures e.g. information exchange and behavioural change). Thus, a range of different approaches are needed depending on where interventions sit on the development – adaptation continuum (see [adaptation and development](#)).

Adaptation indicators may be process-based (to measure progress in implementation) or outcome-based (to measure the effectiveness of the intervention). Developing indicators at the project or programme level is relatively straightforward, as many projects are undertaken within sectors where established monitoring and evaluation systems with proven indicators already exist. However, monitoring and evaluation of policies and national systems is more complex as it requires strong coordination across sectors and levels and is more susceptible to external factors. There are additional challenges with regards to attributing cause and effect in adaptation interventions and accounting for unintended consequences. Practical difficulties in undertaking assessments stem from a general lack of financial, human and technical resources and capacities, a lack of baseline data and historical trends, uncertainty of projected climate change impacts, and insufficient sharing of information across stakeholder groups, levels and sectors. As a result, monitoring and evaluation (M&E) of adaptation is one of the weakest areas of adaptation practice. Of those evaluations carried out to date, most have been undertaken as part of ongoing implementation, whilst only a few have focussed on evaluating interventions after completion.

Given this panorama, there are increasing calls for an integrated M&E framework for adaptation which is more closely aligned with development planning through, for example, the incorporation of adaptation M&E into existing national poverty reduction frameworks such as Poverty Reduction Strategy Papers (PRSPs) and sectoral plans (see [national-level adaptation planning](#)). This would enable adaptation interventions to make use of existing monitoring and evaluation systems rather than create an additional layer of reporting. There are also calls to incorporate M&E approaches from the field of [disaster risk reduction \(DRR\)](#) given that many of the existing DRR indicators and data are relevant for adaptation.

Spearman, M. and McGray, H., 2011, 'Making Adaptation Count: Concepts and Options for Monitoring and Evaluation of Climate Change Adaptation', Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Eschborn, Germany

<http://www.gsdr.org/go/display&type=Document&id=4203>

This publication offers guidance for designing M&E systems for climate change adaptation. It argues that M&E systems need to enable results-based management, promote flexibility, and support iterative learning. Achieving these goals requires development practitioners to carefully articulate their adaptation objectives, clarify the basis for their project design, and make their assumptions transparent. With this foundation, project managers can select indicators and build information systems that are able to track adaptation success.

Hedger, M., Horrocks, L., Mitchell, T., Leavy, J. and Greeley, M., 2008 'Evaluation of Adaptation to Climate Change from a Development Perspective', Desk Review, Institute of Development Studies, Brighton

<http://www.gsdr.org/go/display&type=Document&id=3961>

This paper reviews the current state of the evaluation of climate change adaptation interventions (CCAI). It finds that while development agencies are scaling up the funding and delivery of adaptation interventions, few systematic assessments of CCAI have been undertaken. The authors propose a pyramid of indicators which might provide a framework to measure the accumulation and culmination of effort at multiple levels. This allows for a variety of monitoring and evaluation tools to cope with the complexities of CCAI and to improve the overall quality of assessments. Five key factors for successful adaptation – effectiveness, flexibility, equity, efficiency and sustainability – will need to be reflected in indicators.

UNFCCC Secretariat, 2010, 'Synthesis report on efforts undertaken to monitor and evaluate the implementation of adaptation projects, policies and programmes and the costs and effectiveness of completed projects, policies and

programmes, and views on lessons learned, good practices, gaps and needs', UNFCCC, Bonn

<http://www.gsdr.org/go/display&type=Document&id=3947>

How effective is the monitoring and evaluation (M&E) of adaptation implementation by the EU and its member states? This report examines the range of M&E efforts being undertaken and finds that some areas, such as the monitoring of policies, are more advanced than others. Furthermore, the majority of adaptation projects are still under development or implementation. This is an evolving area and further focus is needed on issues such as defining appropriate climate change indicators and metrics.

Frankel-Reed, J., Brooks, N., Kurukulasuriya, P. and Lim, B., 2009, 'A Framework for Evaluating Adaptation to Climate Change', Chapter 18 in R. Van Den Berg and O N. Feinstein (eds.) Evaluating Climate Change and Development, Transaction Publishers, New Brunswick, New Jersey, pp. 285-298

<http://www.gsdr.org/go/display&type=Document&id=3917>

How can climate change adaptation be tracked in a structured way? Standard development and environment indicators are unable to reflect the nature of adaptation, which is about capacity, behaviour and risk-reducing measures for the advancement of development outcomes. This chapter presents seven considerations for establishing adaptation monitoring and evaluation (M&E) approaches, and outlines an M&E framework for adaptation – the outcome of applying these considerations in the UNDP context.

Prowse, M. and Snilstveit, B., 2010, 'Impact Evaluation and Interventions to Address Climate Change: A Scoping Study', The International Initiative for Impact Evaluation (3ie), New Dehli

<http://www.gsdr.org/go/display&type=Document&id=3926>

The selection and design of climate change mitigation and adaptation interventions should be based on evidence of what works (and what does not), under what circumstances and at what cost. Currently, evidence on the impact of such interventions appears limited, and there is a strong case for the wider application of rigorous impact evaluation. New studies should evaluate positive and negative impacts of climate change interventions on both environmental and welfare outcomes. Programme planners and evaluators should work together to accommodate rigorous impact evaluation from the start. While appropriate outcome indicators will differ between interventions, future evidence syntheses will be improved by work to develop a consensus on a set of common outcome indicators.

The following report is an empirical study of M&E frameworks used by a number of development co-operation agencies for adaptation projects. Based on analysis of 106 project documents, it identifies the features of M&E for adaptation and considers the lessons learned on the choice and use of indicators.

Lamhauge, N., Lanzi, E. and Agrawala, S., 2011, 'Monitoring and Evaluation for Adaptation: Lessons from Development Co-operation Agencies', OECD Environment Working Papers No. 38, OECD Publishing.

<http://bit.ly/GKKHVa>

Additional online resources

- **The Climate-Eval Community of Practice** is dedicated to building the networking and professional capacity of individuals working on the evaluation of climate change and international development projects and programmes.
www.esdevaluation.org/gefeo
- **The Global Environment Facility's (GEF) Evaluation Office** is responsible for ensuring the independent evaluation function within the GEF. It works to establish systems to disseminate lessons learned and best practices emanating from M&E activities and provides independent evaluative evidence to the GEF knowledge base.
www.thegef.org/gef

Adaptation guidance and tools

Mainstreaming adaptation into development programming

Recognition of the links between climate change and development has prompted a range of efforts to integrate climate change adaptation into development planning and decision-making processes (see [adaptation and development](#)). This section of the topic guide presents some of the approaches and tools to support climate change adaptation mainstreaming which have been developed over the past decade.

Olhoff, A. and Schaer, C., 2010, 'Screening Tools and Guidelines to Support the Mainstreaming of Climate Change Adaptation into Development Assistance – A Stocktaking Report', United Nations Development Programme, New York <http://www.gsdr.org/go/display&type=Document&id=3958>

What is climate change adaptation mainstreaming and how it can be made operational at national and sub-national levels? This report looks at the ways in which mainstreaming of climate change adaptation has been defined and it gives an overview of available resources and screening tools to support components of mainstreaming. It argues that although available definitions point to the need for mainstreaming, they give limited practical guidance as to how to integrate climate concerns into the different levels of planning and decision-making.

OECD, 2009, 'Policy Guidance on Integrating Climate Change Adaptation into Development Co-operation', OECD, Paris <http://www.gsdr.org/go/display&type=Document&id=3890>

How can climate change adaptation be mainstreamed in development cooperation agencies and in partner countries' development plans? What are the priorities for governments and donors? This report recommends moving the co-ordination of adaptation implementation into powerful central bodies, and integrating consideration of long-term climate risks in national planning processes as well as in budgets. It also highlights the need to boost the capacity to assess climate change implications, and to examine the resilience of existing policies and frameworks.

World Resources Institute, 2009, 'The National Adaptive Capacity Framework: Key Institutional Functions for a Changing Climate', Pilot Draft, World Resources Institute, Washington DC <http://www.gsdr.org/go/display&type=Document&id=3883>

How can countries adapt to climate change? The National Adaptive Capacity (NAC) framework identifies national-level functions that all countries will need to perform to adapt effectively to climate change: assessment, prioritisation, coordination, information management and climate risk reduction. The framework can be used to assess how well functions are being performed and to identify opportunities and priorities for building adaptive capacity and implementing key activities.

Lim, B. (ed.), 2005, 'Adaptation Policy Frameworks for Climate Change: Developing Strategies, Policies and Measures', United Nations Development Programme, New York and Cambridge University Press, Cambridge <http://www.gsdr.org/go/display&type=Document&id=3911>

How can climate change concerns be incorporated into development planning processes? This Guidebook introduces the Adaptation Policy Framework to help project teams work through the conceptual, technical and operational challenges that arise throughout the adaptation process. The development of an adaptation strategy needs to balance reducing climate change impacts with the constraints of national policymaking processes. Whatever adaptation options and measures emerge, packaging these decisions into an effective strategy will require increased policy coherence across economic sectors, societal levels and timeframes.

Huq, S. and Ayers, J., 2008, 'Taking Steps: Mainstreaming National Adaptation', IIED Briefing, International Institute for Environment and Development, London <http://www.gsdr.org/go/display&type=Document&id=3919>

How can adaptation to climate impacts be seamlessly integrated into development policy and planning? This brief presents a four-step approach to national capacity building on climate change that mainstreams adaptation into development at national and local levels. These steps are: 1) awareness raising; 2) targeting information to stakeholders; 3) adaptation/mitigation pilot activities; and 4) the institutionalisation of a fully integrated climate change-development approach. A 'learning by doing' approach, it focuses first on national capacity to ensure that development in all sectors and at all levels is climate-proofed.

World Bank, 2008, 'Climate Change Adaptation and Mitigation in Development Programs. A Practical Guide', World Bank, Washington DC

<http://www.gsdr.org/go/display&type=Document&id=3930>

What are the main channels through which development programmes could affect a country's capacity to adapt to climate change? This report identifies transmission channels through which development programmes could reduce greenhouse gas emissions and the impacts of impending climate change on individuals. It proposes economic and sectoral reforms that would solidify the link between development and climate change adaptation. Each country should conduct an assessment to measure its institutional capacity to address climate issues. These assessments should also examine the extent to which climate issues are integrated into the government's policymaking framework.

Brooks, N., et al. , 2011, 'Tracking Adaptation and Measuring Development', IIED Working Paper No. 1, International Institute for Environment and Development, London

<http://www.gsdr.org/go/display&type=Document&id=4247>

This paper presents a framework for climate change adaptation programming, including potential indicators, or indicator categories/types, for tracking and evaluating the success of adaptation support and interventions. The framework assesses: a) how well climate risks to development are managed by institutions ('upstream' indicators); and b) how successful adaptation interventions are in reducing vulnerability and keeping development 'on track' in the face of changing climate risks ('downstream' indicators). Its proposed indicators are not intended to substitute for context-sensitive country-level indicators. Rather, they are designed to 'sweep' existing frameworks and approaches in order to present an aggregated picture of overall progress towards adaptation goals.

Project level adaptation tools

General tools

- **UNDP, 2010, 'Designing Climate Change Adaptation Initiatives', United Nations Development Programme, New York**
www.undp.org/climatestrategies/docs/lecrds/toolkit.pdf
- **USAID, 2007, 'Adapting to Climate Variability and Change: A Guidance Manual for Development Planning', USAID Global Climate Change Program, Washington DC**
www.usaid.gov/our_work/environment/climate/docs/reports/cc_vamannual.pdf
- **CARE International, 2010, 'Toolkit for Integrating Climate Change Adaptation into Development Projects', Digital Toolkit – Version 1.0 – July, CARE International, London**
www.careclimatechange.org/files/toolkit/CARE_Integration_Toolkit.pdf
- **Bizikova, L., Bellali, J., Habtezion, Z., Diakhite, M. and Pintér, L., 2009, 'IEA Training Manual Volume Two: Vulnerability and Impact Assessments for Adaptation to Climate Change', UNEP, IISD and UNITAR**
<http://hqweb.unep.org/ieacp/iea/training/manual>

Climate screening

- **Institute of Development Studies – ORCHID: Opportunities and Risks from Climate Change and Disasters**
www.ids.ac.uk/climatechange/orchid
- **Tearfund – CEDRA: Climate Change and Environmental Degradation Risk and Adaptation Assessment**
<http://tilz.tearfund.org/webdocs/Tilz/Topics/Environmental%20Sustainability/CEDRA%20D5.pdf>

Community-based adaptation

- **Practical Action, WWF, IUCN Nepal, CECI Nepal and NAVIN, 2010, 'Review of Community Based Vulnerability Assessment Methods and Tools', review for the Ministry of Environment, Government of Nepal**
www.climatenepal.org.np/main/?p=research&sp=onlinelibrary&opt=detail&id=282
- **IISD/Intercooperation/SEI/IUCN – Community-based Risk Screening Tool – Adaptation and Livelihoods (CRISTAL)**
www.cristaltool.org
- **CARE International – Climate Vulnerability and Capacity Analysis Handbook**
www.careclimatechange.org/cvca/CARE_CVCAHandbook.pdf
- **FAO E-learning tool – Planning for Community-based Adaptation to Climate Change**
www.webgeo.de/fao-webgeo-2-intro/
- **Bread for All and Heks – CliDR: Participatory Tool on Climate and Disaster Risks**
www.adaptationlearning.net/sites/default/files/CliDR%20Eng_Vers5_0.pdf

Disaster Risk Reduction

- **ProVention Consortium – Tools for Mainstreaming Disaster Risk Reduction**
www.proventionconsortium.org/?pageid=32&projectid=1
- **Red Cross/Red Crescent – Climate Guide**
www.climatecentre.org/downloads/File/reports/RCRC_climateguide.pdf
- **Asian Disaster Preparedness Center – Child-oriented Participatory Risk Assessment and Planning Toolkit**
www.gdnonline.org/resources/ADPC_CDP_COPRAP_toolkit.pdf
- **Harris, K., et al., 2012, 'Changing Climate, Changing Disasters: Pathways Towards Integration', Strengthening Climate Resilience, Brighton**
<http://community.eldis.org/.59d5ba58/SCR-changing-climate-changing-disasters-2012.pdf>

Additional online resources

- **The Adaptation Learning Mechanism (ALM)** is a collaborative knowledge-sharing platform which provides access to a range of tools and resources to support adaptation practice and the integration of climate change risks and adaptation into development policy, planning and operations.
www.adaptationlearning.net
- **The UNFCCC Compendium on methods and tools to evaluate impacts of, and vulnerability and adaptation to, climate change** is designed to assist Parties and other potential users in selecting the most appropriate methodology for assessments of impacts and vulnerability, and preparing for adaptation to climate change. The Compendium was developed in 1999 and updated in 2003, 2005, 2008 and more recently in 2009.
http://unfccc.int/adaptation/nairobi_workprogramme/knowledge_resources_and_publications/items/5457.php?anf=&&sort=&dirc=&seite=1&nwp=org§or_pdf=&theme_pdf=&type_pdf
- **weADAPT** is an online collaborative space which provides guidance by pooling expertise from a wide range of organisations that contribute to adaptation science and practice.
www.weadapt.org