Institute of Development Studies

TEARFUND
CHRISTIAN ACTION WITH THE WORLD'S POOR

Adapting to climate change



Challenges and opportunities for the development community

Adapting to climate change
Challenges and opportunities for the development community

Authors: Dr Tom Mitchell and Dr Thomas Tanner
Institute of Development Studies
www.ids.ac.uk/ids

Editing: Rachel Roach and Seren Boyd

Cover photos: Marcus Perkins, Jim Loring and Leyton Thompson / Tearfund

Contact: Rachel Roach, Climate Change Policy Officer (ppadmin@tearfund.org.uk)

Tearfund is an evangelical Christian relief and development agency working with local partners to bring help and hope to communities in need around the world.

Printed on recycled paper

Adapting to climate change

Challenges and opportunities for the development community

Dr Tom Mitchell and Dr Thomas Tanner,
Institute of Development Studies

Introduction

The profile of climate change has risen from being an environmental issue to a major development issue, billed in a recent UK White Paper as the 'biggest threat facing the world'.[1] Development agencies are already playing an important role in advocating for cuts in greenhouse gas emissions, but some change is now inevitable. Attention must also focus on how society and nature can adapt in a changing climate.

This document aims to improve understanding about adaptation to climate change within development agencies, their partners and the other institutions/individuals working in the development community. In particular, it is designed to stimulate broader engagement and debate on key issues around development and climate change adaptation, which have been mostly restricted to the 'climate change community'.

Building low dykes of stones is one way of conserving water in areas of low rainfall.

Photo: Jim Loring/Tearfund

1 DFID (2006) *Eliminating World Poverty: making governance work for the poor.* International Development White Paper. TSO, London. Para 1.19.

Contents

Villagers in north India practice for flood evacuation.

Photo: Caroline Irby/Tearfund

1 What is climate change adaptation?

The leading international scientific body on climate change, the Intergovernmental Panel on Climate Change (IPCC), has been central to efforts to synthesise research to inform policy-making on climate change. The vast majority of the scientific community is in agreement that climate change is happening, that emissions of greenhouse gas from human activities are a significant driver of climate change, and that climate change poses a threat to current development.

Climate change has generated its own glossary of terms and definitions. The natural sciences have had particularly strong influences in its development. The following paragraphs briefly introduce some of the principal terms.

Most international efforts on climate change have centred on limiting greenhouse gas emissions associated with human activity, particularly the burning of fossil fuels such as coal, oil and gas. This focus reflects an attempt to tackle the cause of the problem and is driven by the ultimate objective of the largest international agreement on addressing climate change, the United Nations Framework Convention on Climate Change (UNFCCC)[2]. In climate change terminology, tackling climate change by limiting greenhouse gas emissions is known as **mitigation**.

However, there is growing momentum on efforts to better understand the **vulnerability** of human societies to the impacts of both current climate and future climate change. Vulnerability is a combination of exposure to external shocks (e.g. a flood) and stresses (e.g. a gradual temperature increase), and the ability to cope with the resulting impacts. It is dependent on a wide variety of institutional, economic and environmental factors, not all of which are linked directly with the climate.

Current climate shocks and stresses already test, and sometimes exceed, this ability to cope. Without action to reduce exposure and improve the capacity to cope, the gradual and sudden changes associated with climate change will increase vulnerability in many areas. The likely regional impacts of climate change are shown in the Appendix. At the same time, these changes may also increase vulnerability to other non-climate shocks and stresses.

Crucial to reducing vulnerability to climate change is understanding how individuals, groups and natural systems can prepare for and respond to changes in climate – known in climate change terminology as **adaptation**. Effective adaptation will manage and reduce the risks associated with changes in climate in a similar way to **disaster risk reduction** measures for present day climate extremes. The potential to adjust in order to minimise negative impacts and maximise any benefits from changes in climate is known as **adaptive capacity**.

Adaptation is a broad concept covering actions by individuals, communities, private companies and public bodies such as governments. Successful adaptation can reduce vulnerability by building on and strengthening existing coping mechanisms and assets, targeting climate change vulnerability with specific measures, and integrating vulnerability reduction into wider policies.

---

2 UNFCCC Article 2 refers to the convention's ultimate objective as '*stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system*'.

Source: IPCC Third Assessment Report, 2001

Formal definitions of climate change adaptation terminology

The leading international scientific body on climate change, the Intergovernmental Panel on Climate Change (IPCC), defines **vulnerability** in terms of systems, as '*the degree to which a system is susceptible to, or 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 variation to which a system is exposed, its sensitivity, and its adaptive capacity.*'

Adaptation is defined as 'adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities'.

Mitigation (tackling the causes of climate change) and adaptation (tackling the effects) are of course closely related. The amount of adaptation necessary will depend partly on the success of mitigation efforts. At the same time, some actions can help foster both adaptation and mitigation, such as sustainable agricultural systems, soil and water conservation measures involving planting trees which then absorb greenhouse gases, or renewable energy initiatives that reduce dependence on fuel-wood collection.

Adaptation has been approached from both **top-down** and **bottom-up** perspectives, with considerable overlaps between the two. The former relies on climatic and applied modelling to predict secondary impacts (e.g. on crops or water availability) from a projected change in climate. Although fairly technical, these are applicable to wide areas and can indicate where broader adaptation measures may be necessary, such as drought-resilient crop varieties or expanded irrigation systems.

Bottom-up approaches assess vulnerability and adaptive capacity to current climate variations and future climate trends at the local level. Climate variability is a reality that humans have always been exposed to and have developed different ways of dealing with. Existing coping mechanisms are used as a platform for fostering resilience to future changes. While they can incorporate modelling projections, they draw primarily on local knowledge and can more effectively target the poorest and most vulnerable in developing appropriate adaptation responses.

Climate change exacerbates existing environmental challenges, for example declining water resources, and thus increases the urgency of managing natural resources in a sustainable way. Therefore adapting to climate change often builds directly on existing efforts to manage natural resources effectively, as later sections of this paper will show.

In addition to the link with sustainable development approaches, there are also considerable overlaps between climate change adaptation and disaster risk reduction. Work to share lessons and experiences between disciplines is ongoing.

2 Why should climate change adaptation interest development agencies?

Summary

- Poor people in developing countries are likely to be the worst affected by climate change.
- These same people have done the least to cause the problem – there is a moral and equity-based imperative for industrialised countries to help the poor to adapt.
- Development agencies have a key role in bringing development and poverty issues to climate change forums nationally and internationally

2.1 Because climate change threatens progress on poverty reduction

Climate change threatens to derail progress in poverty reduction and achievement of the Millennium Development Goals (MDGs). The impacts are likely to accentuate the existing shocks and stresses faced by many communities in developing countries.

The poorest nations of the world and poor groups in developed countries are likely to be hardest hit by the effects of climate change because they:

- rely heavily on climate-sensitive sectors such as agriculture and fisheries
- are less able to respond to the direct and indirect effects of climate change due to limited human, institutional and financial capacity
- tend to be located geographically in marginal areas that are more exposed to climatic hazards, such as flood plains, or are on nutrient-poor soils.

Climate change has remained a predominantly environmental and energy-related issue in part because impacts on human development are presented by climate change models as uncertain. These impacts are presented as occurring in the medium to long term, and on a regional or international scale. More recently, however, climate change is moving onto development agendas as greater emphasis is placed on changes that are already occurring. As mentioned above, there is acknowledgement that we are already bound into a certain degree of change by existing levels of greenhouse gases in the atmosphere. Consequently, greater scientific and non-scientific field-based evidence has emerged on contemporary changes in climate and their impact on poverty reduction goals.

The 2005 Tearfund report *Dried Up, Drowned Out: voices from the developing world on a changing climate* is a case in point. Such work has demonstrated climatic impacts broadly consistent with the future model-based projections of change (greater climatic extremes and less predictability of rains or the seasons). It has also shown how impacts of these changes are hitting the poorest hardest, exacerbating existing environmental problems, stretching coping capacities, and challenging achievement of the MDGs (see Figure 1).

This provides the primary rationale for development agencies to engage with the issue of climate change adaptation.

Figure 1
Impacts of climate change

Source: Modified from *DFID Climate Change and Poverty keysheet No.1* [3]

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

3 For further information on MDG impact, see website of Australian Climate Action Network: www.cana.net.au/socialimpacts/global/millennium-development-goals.html

Working with partners and communities at grassroots level also puts development agencies in a position to raise levels of awareness about climate change and stimulate discussion on climate change issues. Many poor communities, and particularly those with limited education and access to information, do not connect the climatic changes they are already experiencing with a global phenomenon, nor are they aware of potential future changes. Raising basic awareness of the causes and impacts of climate change is crucial to efforts to empower households and communities so they can adapt and increase their resilience to current and future climates.

2.2 Because adaptation has equity and justice dimensions

Although the poorest countries and poorest people are likely to suffer most from the impacts of climate change, they have contributed least to the climate change problem through greenhouse gas emissions. Climate change therefore not only implies a moral responsibility on the industrialised nations to reduce their emissions, but also to provide technical and financial assistance to help the most vulnerable people to cope with and adapt to climate change. Some argue that these equity and justice issues surrounding adaptation make it fundamentally different from other types of development assistance.

The issue of whether climate change requires specific funding mechanisms dominates the adaptation agenda in international climate change negotiations. Of particular concern are the quantity of funds and how they are managed and implemented. Two funds for adaptation have been established under the UN Framework Convention on Climate Change (UNFCCC), with voluntary contributions from industrialised countries. A third will use a share of the proceeds from trading emissions credits under the Kyoto Protocol. These funds were set up partly because of the need to address equity dimensions of adaptation (i.e. those who have caused the problem compensating for the effects).

Even though these funds exist, development agencies may also consider themselves under an obligation to tackle adaptation, out of concerns over equity and justice.

2.3 Because poverty issues are central to climate change debates

Development NGOs and their partners play a central role in supporting poverty reduction of vulnerable households and communities at the grassroots level. The experiences of these groups in adapting to variations in climate are crucial for informing climate change adaptation efforts at national and international levels. To be effective, national-level adaptation plans will need to build on existing coping mechanisms and understand how climate change is likely to affect other shocks and stresses. Working at field level, development agencies can help to bring such knowledge to inform policy-making and planning.

The international negotiations on climate change in the UNFCCC have been informed primarily by the natural sciences, and are dominated by experts from meteorology, environment, and energy sectors, as well as diplomats. Development issues around poverty reduction and equity for poor people are therefore often secondary to national strategic and economic interests in framing debates. Development NGOs can help bridge this and other

disconnections between the political process in the UNFCCC and the poverty reduction community. The global climate change debate can be presented in terms of inequality and injustice for human beings as well as habitat loss for polar bears!

Similarly, development agencies can bring a broader range of approaches, tools and experiences to bear on issues surrounding climate change adaptation as they are already working in directly linked fields (such as disaster risk reduction and sustainable resource management). Section 3 will explore how different people working in different sectors could incorporate climate change adaptation into their work. The sectors considered do not make up an exhaustive list. Climate change affects all aspects of development, but here a selection of some of the most relevant areas for consideration by the development community are presented.

2.4 Because adaptation should be linked to debates on reducing greenhouse gas emissions

We must improve our understanding of how climate change affects people's vulnerability, and the challenges of coping with change. Such an understanding is crucial not only for sustaining poverty reduction, but also for informing advocacy efforts to get more urgent action on reducing global greenhouse gas emissions.

Development agencies can share experience showing that the impacts of climate change are already threatening poverty reduction goals at field level. This can inform coalitions and campaigns centred on both mitigation and adaptation issues. For example, in the UK development agencies are active in the Stop Climate Chaos and Up in Smoke coalitions, which are pushing for international responses to help developing countries in adaptation, as well as advocating for significant emissions reductions in industrialised countries. Similar coalitions are being established elsewhere, including in developing countries.

Working on climate adaptation also opens up avenues for considering how to provide energy to poor communities to promote and sustain growth and poverty reduction. Larger and less efficient grid-based power systems currently favoured internationally often bypass the needs of poorer and more remote communities. Promoting decentralised energy can help combine the goals of cutting emissions through efficiency savings and of pro-poor energy provision and consumer empowerment. It also prompts debate on how the use of renewable energy to deliver power locally can be scaled up to the national and continental levels, even potentially to create net exports of clean energy.

3 What are the current adaptation experiences of development agencies?

Summary

- **Community-based climate change adaptation** has evolved alongside international climate change negotiations and has developed a distinctive terminology, community and set of institutions. There is a considerable overlap between approaches used by people working on community-based adaptation and traditional development sectors.
- Climate change will lead to new patterns of **disease**, driven by temperature and rainfall variation. Promoting proactive, rather than reactive, **health** services is a priority.
- Uncertainty over rainfall levels will create significant challenges for managing **water and sanitation**. Demands on water supplies will increase, while replenishment will be less predictable, requiring dedicated water conservation, leak reduction, and education programmes.
- Changes to the climate will affect **agriculture and food insecurity**. Innovative conservation farming techniques are required, and seasonal climate forecasts must be used to inform well-integrated crop management decisions.
- As climate change causes more intense and possibly more frequent hydro-meteorological hazards, considering how to make **disaster risk reduction** more climate-sensitive is particularly important.
- There are a number of options for **integrating climate change approaches** within existing programmes, such as seminars, partner conferences and integrated tools.
- Development organisations can **advocate** for action on climate change adaptation.
- Forging links with academics and researchers with knowledge of **international research programmes** will help to create and refine new approaches to adaptation.

3.1 Community-based adaptation

Community-based adaptation has evolved alongside the UNFCCC negotiations. So while there is considerable overlap with other sectors and approaches, it has developed a distinctive set of terminology and its own research community. As with work on disaster risk reduction and water and sanitation, community-based adaptation recognises that environmental knowledge and resilience to climate impacts lie within societies and cultures. The focus should therefore be on empowering communities to take action on vulnerability to climate change, based on their own decision-making processes. The 'bottom-up' aspects of community-based adaptation are in part a reaction to many 'top-down' energy-based interventions, which commonly dominate climate negotiations.

The goal of community-based adaptation projects is to increase the climate resilience of communities by enhancing their capacity to cope with less predictable rainfall patterns, more frequent droughts, stronger heatwaves, different diseases and weather hazards of unprecedented intensity. While projects labelled as 'community-based adaptation' are relatively new, work in other development sectors has been developing participatory methodologies, raising awareness of climate change and fostering adaptive capacity for many years, without using climate adaptation terminology. The climate adaptation community is increasingly aware of the common ground it shares with the mainstream development community. The livelihoods and vulnerability focus of much climate adaptation research and practice will help forge stronger links between the two communities.

CASE STUDY
CARE Bangladesh – Reducing Vulnerability to Climate Change project (January 2002–March 2004).

The goal of the community-based adaptation project was to increase the capacity of communities in the south-west region of Bangladesh to adapt to the adverse effects of climate change. It worked in six districts on the coast exposed to sea-level rise, loss of biodiversity, increasing salinity, more extreme rainfall variability, and more intense cyclones. CARE started with a vulnerability assessment and a knowledge, attitudes and behaviour survey, which revealed a very low level of awareness of climate change. However, through local partners, CARE developed capacity to engage with climate adaptation, and promoted livelihood diversity as a practical response. As a result, 270 households started growing vegetables on floating gardens in waterlogged areas, and 1,700 households began rearing ducks – both positive results in flood-prone areas.

CASE STUDY
Sustainability study, Turkana, Kenya

In 2005 a study was conducted in Turkana, Kenya, by Foodlinks Resources, in collaboration with Practical Action and other NGOs. It assessed the sustainability of safety nets provided to farmers in view of potential climate change impacts. It found that, before the 1980s, famine occurred every ten years in the region but it now happens every year. The increased frequency of droughts, coupled with lack of access to markets, insecurity and poor infrastructure, leaves more than 80 per cent of the population living in poverty. Foodlinks Resources reviewed the suitability of Practical Action's Meat Safety Net Programme for reducing livelihoods' vulnerability to the recurrent droughts. The programme was developed in response to the food aid dependency created through the World Food Programme's standard distribution of maize and beans. As many animals die during droughts, the Meat Safety Net Programme involves contracting community members to buy the weakest cattle from farmers (for about £8 each). Other people are paid to slaughter the cattle and the meat is distributed to the most vulnerable people. The skins are given to women to sell. The fee paid for each weak animal can be used by farmers to restock their herds. This initiative has proved popular among communities as it is more supportive of livelihoods than food relief. However, ways to create more resilient livelihoods in the long term need to be found.

Source: Foodlinks Resources

Ideas for Action[4]

To reduce the vulnerability of livelihoods to climate change risks, community-based development projects must:

- Begin with a thorough understanding of local livelihoods, so protecting assets vulnerable to current and future climate risks can be a core project activity.
- Help communities develop an understanding of the main climate risks and how they impact on livelihoods (through a learning-by-doing approach).
- Emphasise active participation of community members in all stages of the project (design, implementation, monitoring).

4 Modified from IUCN, IISD, SEI-B, Interco-operation (2004) *Sustainable Livelihoods and Climate Change Adaptation* and from the outputs of Working Group 1, LCA Climate Adaptation Challenges for Africa Workshop, Nairobi 2006. www.linkingclimateadaptation.org

- Build on existing social institutions to carry out activities.
- Encourage the strong participation of women, recognising their role as community resource managers, while also acknowledging their specific vulnerability to climate risks.
- Enhance local technical, financial and managerial skills.
- Invest in long-term resilience-building efforts, which also meet immediate development needs.
- Advocate a policy framework that decentralises natural resource management.
- Recognise that current coping strategies may not be sustainable.

Resources

- Assessment of Impacts and Adaptations to Climate Change (AIACC) project outline.
  www.aiaccproject.org/aiacc.html
- Database of AIACC projects.
  http://sedac.ciesin.columbia.edu/aiacc/index.html
- Linking Climate Adaptation (LCA) theme on community-based adaptation, including a collection of relevant literature.
  www.eldis.org/climate/adaptation/themes/community-based.htm
- South South North is producing an 'Adaptation Project Protocol' (SSNAPP) for community-based adaptation, outlining a model method for undertaking such projects. See www.southsouthnorth.org and click on library, and find adaptation.
- Poverty and Climate Change – reducing the vulnerability of the poor through adaptation (2001).
  http://web.worldbank.org/servlets/ECR?contentMDK=20480623&sitePK=406964
  and http://web.worldbank.org/servlets/ECR?contentMDK=20480619&sitePK=406964
- UNFCCC guide to methodologies and tools to evaluate climate change impacts and adaptation.
  http://unfccc.int/adaptation/methodologies_for/vulnerability_and_adaptation/items/2674.php
- See also the UNFCCC database on local coping strategies to climate variability and change.
  http://maindb.unfccc.int/public/adaptation
- WWF has developed a community toolkit for its climate witness programme, which describes how some participatory appraisal methods can be used for climate adaptation activities.
  www.wwfpacific.org.fj/publications/climate_change/cw_toolkit.pdf

3.2 Health

Long-term changes in rainfall and temperature affect whether a region is exposed to certain diseases. For example, even small increases in temperature and rainfall boost the population of disease-carrying mosquitoes and result in increased malaria epidemics or diseases spreading to new areas.

The first detectable changes in human health may well be alterations in the geographic range (latitude and altitude) and seasonality of certain infectious diseases – including infections transmitted by animals and insects such as malaria and dengue fever, and food-borne infections, which peak in the warmer months. Warmer average temperatures combined with increased climatic variability would alter the pattern of exposure to extremes in temperature and so would impact health, in both summer and winter. Public health systems will need to prepare and adapt to these new conditions.

The Third Assessment Report of the Intergovernmental Panel on Climate Change concluded that climate change would cause:

- increased heat-related mortality and morbidity
- decreased cold-related mortality in temperate countries
- greater frequency of infectious disease epidemics following floods and storms
- substantial health effects following population displacement from sea-level rise and increased storm activity (see Figure 2).

Figure 2
Health effects following climate change

Source: Chatterjee K, Chatterjee A and Das S (2005) Case Study 2: India – community adaptation to drought in Rajasthan, in *IDS Bulletin* Vol 36 (4) October 2005.

Categories of health problems caused by climate change	The effects
Temperature-related morbidity	Heat- and cold-related illnesses Cardiovascular illnesses
Animal-borne diseases	Changed patterns of diseases Malaria, filarial, kala-azar, Japanese encephalitis, and dengue caused by bacteria, viruses and other pathogens carried by mosquitoes, ticks and other vectors
Health effects of extreme weather	Diarrhoea, cholera and poisoning caused by biological and chemical contaminants in the water. (Even today about 70 per cent of the epidemic emergencies in India are water-borne) Damaged public health infrastructure due to cyclones/floods Injuries and illnesses Social and mental health stress due to disasters and displacement
Health effects due to insecurity in food production	Malnutrition and hunger, especially in children

CASE STUDY
Early warning systems

A number of research initiatives are developing early warning systems for a range of diseases sensitive to climatic change. Seasonal climate forecasts, environmental modelling and public health surveillance techniques are being combined to trace how climate change is altering traditional vulnerability patterns. Research in 2001 by the Climate and Human Health Research Unit at the University of Nairobi led to the development of a model which, they hoped, could use climate signals to give a two-month warning for malaria epidemics. The model uses knowledge of different topographic and hydrologic conditions, and the different thresholds of climatic conditions required to propagate malaria. Once a threat has been identified, preparations for the epidemic can begin, such as distributing treated mosquito nets, providing malaria vaccinations, control spraying and draining stagnant water.

Source: *Epidemic Malaria: Preparing for the Unexpected.* Connor S, and Thomson M (2005) www.scidev.net/dossiers/index.cfm?fuseaction=policybrief&policy=77&section=479&dossier=23

Ideas for Action[5]

- Public health services are likely to be stretched as climate change presents new challenges for combating disease. Promoting proactive, rather than reactive, services is a priority.
- Health authorities need to be made aware of scientific and meteorological predictions related to potential epidemics, heatwaves and floods.
- Training public health workers to use seasonal climate forecasts to identify health risks is an option, which would allow for better planning and the implementation of preventative measures.
- While surveillance, vaccination programmes and education will remain important, it will be necessary to broaden participation in public health, for example to climate scientists, urban planners and housing specialists.
- Collaborative approaches will help with the vital task of screening current public health projects for future climate risks, to ensure they improve the well-being of communities in the long term.

Resources

- World Health Organisation: Climate Change and Adaptation Strategies for Human Health. *Investigation of How Climate Change Impacts on Health.*
  www.who.dk/ccashh
  www.who.int/globalchange/climate/en/ccSCREEN.pdf
- Publication available online: *Methods of Assessing Human Health Vulnerability and Public Health Adaptation to Climate Change* (2004).
  www.who.dk/eprise/main/WHO/Progs/GCH/Publications/20031125_1
- London School of Hygiene and Tropical Medicine – Centre on Global Change and Health.
  www.lshtm.ac.uk/cgch/climate.html
- Climate and Human Health Research Unit, University of Nairobi, Kenya.
  www.kemri.org/centres/cvbcr/programmes_climate.asp

5 (2005) 'Health and Climate Change: a call for action', in *British Medical Journal* 2005 (331) 1283–1284.

- Health and Climate Change Session at the Development and Adaptation Days, 11th Conference of the Parties, Montreal.
  www.iisd.ca/climate/cop11/dad/ymbvol99num2e.html
- WMO's World Climate Programme and the Commission for Climatology launched a new initiative at the 14th session of the Commission (3–10 November 2005, Beijing, China) to study the role of climate in the spread of infectious disease.
  www.wmo.int/web/catalogue/New%20HTML/frame/engfil/wcn.html

3.3 Water and sanitation

With sea-level rise, salt-water intrusion and rainfall uncertainty, water resources are highly vulnerable to climate change. Research in 2006 by the African Earth Observatory Network (AEON) has found that in areas receiving 500mm of rainfall, a 10 per cent reduction would cut surface water supplies by 50 per cent. While uncertainty remains over which areas will receive more or less rainfall, millions of people are likely to be forced to walk further for water. The AEON research suggests reduced access to water will lead to significant migration, which may in turn lead to insecurity. Urban areas will come under significant pressure.

Climate scenarios must be combined with bottom-up conservation. This is the only way to help urban water managers design networks able to cope with variations in precipitation and cater for changes in demand caused by rapid changes in population. Promoting water conservation and rainwater harvesting, reducing leaks and developing education programmes will all be crucial for creating adaptive capacity.

An approach known as 'Integrated Water Resource Management' (IWRM) is widely recognised as the most effective way to optimise water availability (or often simply referred to as 'water resource management'). This is the practice of making decisions and taking actions after considering a range of viewpoints of how water should be managed. IWRM is also identified as being a fundamental basis for providing the long-term environmental security necessary for sustainable development and the provision of water and sanitation required to meet the MDGs. IWRM is therefore key in the face of climate change and must take into account the relevant risks.

CASE STUDY
CaPP-supported project, Rajasthan

The German Climate Protection Programme for Developing Countries (CaPP) has supported an Indo-German Bilateral Watershed Management Project piloted in Rajasthan. This project has focused on how to adapt smaller water catchments to climate change. It has encompassed many different fields: raising awareness of adaptation options among project partners, developing water conservation irrigation techniques, refreshing and disseminating traditional coping strategies for variable rainfall, supporting the diversification of income-generating measures, and supplementing subsistence agriculture with market-oriented, drought-resistant crops.

Source: *Adaptation to Climate Change – causes, impacts and responses*, German Federal Ministry for Economic Co-operation and Development, GTZ.

CASE STUDY
Jemed, Niger

Since 1990, Tearfund partner organisation Jemed has been working with the semi-nomadic Tuareg people in Niger to reduce their vulnerability to drought. The Tuareg are well adapted to surviving in the Sahel's dry, marginal land but subsequent droughts in recent decades have thwarted recovery after pastures fail.

The work with the Tuareg provides an example of a development project that has not been designed in response to climate change specifically, but in practical terms is serving this purpose. Jemed has been helping communities establish 'fixation points' to enable them to survive the changes that desertification and increased population have brought. As a result, the community can better manage and use the resources of the surrounding area and protect them from encroachment by farmers. Fixation points not only include wells, but also enable communities to develop a social infrastructure and education, training, health and agricultural projects, while retaining many of their traditional pastoral ways.

Jemed also helps communities conserve rainwater, for example by forming low dykes made of stones across the contour of a valley. When the rains come, the stones slow the flowing streams, causing water to sink deeper into the soil. Behind the dykes, the Tuareg have been able to plant wild wheat. In Intikikitan, an established dyke has increased moisture levels to the extent that plant species not seen for half-a-century have reappeared.

Source: Tearfund

Ideas for Action

- It is crucial to develop water management programmes that carefully examine the future challenges of climate change and relevant adaptation options. Existing projects should be screened for climate change risks and checked to make sure they are not increasing people's vulnerability by restricting their future access to water. A checklist for use in existing programmes could serve this purpose.
- Projects should ideally be designed and implemented in collaboration with environmental engineers, and where possible with climate scientists. Updated assessments of meteorological and hydrological data need to be an integral part of water resources planning and management.
- Adaptation options include adjusting water management to increase the sources of water supply and to improve conservation. A study by Orindi and Murray (2005) on adaptation to climate change in East Africa called for the wider use of small-scale, low-tech solutions. For example, using rooftops and tanks to harvest and store water, and encouraging people to use grey water for washing, bathing, and watering gardens and livestock. Techniques that slow the flow of water and thus increase time for the replenishment of groundwater are also important e.g. dykes and check dams.
- Using water recycling technologies and working to reduce leaks will have to form part of future water management strategies.
- Governments may have to consider water transfer programmes if rainfall distribution becomes increasingly uneven. However, such large-scale expenditure may not be wise while considerable uncertainties remain.
- Securing the rights of access to water supplies for small-scale farmers is just as important, because current programmes formalising rights are marginalising the poor.

- Considering each of these adaptation measures within current and future water and sanitation programmes needs to form an important part of an integrated, participatory water management approach.

Resources

- The Co-operative programme on Water and Climate, including the 'water and climate library'.
  www.waterandclimate.org
- Orindi V and Murray L (2005) *Adapting to Climate Change in East Africa: a strategic approach*.
  www.iied.org/pubs/pdf/full/9544IIED.pdf
- Presentations on water and climate adaptation given at the World Meteorological Organisation conference, on 'Living with Climate Variability and Change', in Espoo, Finland.
  www.waterandclimate.org/data/events_presentations.html
- 'Climate Change to Create African Water Refugees'.
  www.alertnet.org/thefacts/reliefresources/114303555233.htm
- IUCN, the World Conservation Union's online book *Change – adaptation of water resources management to climate change*.
  www.iucn.org/themes/wani/change
- Presentation on water resource management and climate change given at the 'Living With Climate' conference held in Finland in 2006.
  www.livingwithclimate.fi/linked/en/Schulze.pdf

3.4 Agriculture and food security

The vast majority of the world's poorest people rely on local ecosystems to support their livelihoods. For example, rain-fed agriculture is and will remain the dominant source of staple food production for most of the rural poor in sub-Saharan Africa. Many are struggling to cope with current rainfall variability, and predictions of the impact of climate change suggest this variability is likely to increase. In some parts, droughts that used to occur once every ten years are now more regular. For example, it is estimated that between 1950 and 1999, there has been a decline in summer rainfall over Southern Africa of around 20 per cent[6]. It is also predicted that such conditions will intensify in the 21st Century as a result of climate change. In 2002, 14 million people in Southern Africa were affected by drought and food insecurity as a result of the change in rainfall levels and patterns.

The half-century-long trend of falling rainfall in Southern Africa is set to continue. By 2050, the US National Center for Atmospheric Research reports that the Southern African wet season could be 10–20 per cent drier, compared with the previous 50 years.

6 news.bbc.co.uk/1/hi/sci/tech/4479640.stm

However, few climate change models can predict rainfall patterns in developing country regions with certainty or on timescales relevant to most development agencies. This means many recent approaches to adapting the agricultural sector to climate change have relied on seasonal forecasts, which are better developed and more accurate. These have been matched with models that show which crops grow best under different climate scenarios in different soil conditions.

CASE STUDY
EFZ, Zambia

Tearfund partner Evangelical Fellowship of Zambia (EFZ) has implemented a technique, known simply as 'conservation farming', which has helped communities in the Monze East area of Zambia deal with changing rainfall patterns. This is vital in an area which has recorded the lowest river water levels in 12 years and in a country where 17 per cent of the population live with HIV.

Conservation farming is a minimum tillage method, which traps moisture, improves the quality of the soil, minimises soil erosion and creates growing conditions which exhibit a high drought tolerance. There is typically a tenfold yield increase associated with this method. Conservation farming makes the farmer less reliant on rainfall, as crops can utilise the moisture trapped in the soil.

Diversification is central to efforts to adapt to changes in rainfall patterns in Zambia. As a method, conservation farming is suitable not only for the production of maize and sorghum, but also for vegetable crops and herb cultivation. By encouraging farmers to diversify, EFZ helps to ensure that farmers' yields remain high even in times of low rainfall. Tearfund and EFZ are confident that conservation farming, along with community strategies of grain distribution, livestock replenishment and diversification, are important steps on the path to increased food security in a region so vulnerable to the devastating effects of climate change.

Source: Tearfund

CASE STUDY
Oxfam, Mozambique

Oxfam UK, through its association with the Tyndall Centre-funded Adaptive project, conducted research in Gaza province in southern Mozambique to see how communities' adaptation to past challenges can build resilience to future climatic changes. The research found strong social networks evolved through periods of conflict and shocks. This solidarity resulted from a scarcity of cash in the local economy because of increasingly frequent and severe drought and storms, which led to the development of a non-cash economy based on exchanging labour. These social networks have helped to create farming lobbies, who want to make sure households can grow crops in more than one area, spreading risk. The lesson for development agencies is not to support one type of farming in one area, as the diversity of techniques and land holdings creates resilience to climate change.

The farming lobbies have also become a means of experimenting with ways to deal with more pronounced droughts. The research showed that 45 per cent of farmers interviewed had changed to more drought-resistant species such as cassava and sweet potato, following exchanges with other farmers and with other farming lobbies.

Source: www.oxfam.org.uk/what_we_do/issues/climate_change/story_moz.htm

Ideas for Action

- Community-centred development projects can incorporate adaptation to climate change through the following activities:
- Monitor species and the amount of vegetation within the project area to assess the impacts of climate change. Asking community members to report on invasive species and changes in growing patterns has been shown to effectively promote climate change awareness.
- Seasonal climate change projections can be reviewed during workshops with farmers, and decisions can be taken on how to respond.
- Promote awareness of soil and water conservation measures and provide support in the implementation of these approaches.
- Keep an updated climate change scenario on file and refer to this at each stage of the project design to make sure activities are not increasing vulnerability to climate change. The scenarios can also be used as an advocacy tool.
- Participatory appraisal techniques can be used to assess the impacts of climate variability and change on livelihoods and production. Simple cost/benefit analysis of different adaptation options can also be included.
- With drier climates, fire management techniques and training need to be considered.
- Early warning systems are especially relevant for agriculture. Regional and local seasonal predictions are currently in use and being developed using weather forecasting tools. For example the Famine Early Warning System Network in Sub-Saharan Africa (FEWSNET).

Resources

- Thornton PK et al (2006) *Mapping Climate Vulnerability and Poverty in Africa*. Report to the Department for International Development.
  www.research4development.info/PDF/FINAL%20vuln-map-2.pdf
- Food and Agriculture Organisation's climate change website, including a compendium of publications on how climate change will influence food security and ecosystem services.
  www.fao.org/clim
- Topic review of literature on climate change and global food production.
  www.climate.org/topics/agricul/index.shtml
- Presentations on food security, agriculture and climate change given at the 'Living With Climate' conference held in Finland in 2006.
  www.livingwithclimate.fi/linked/en/Meinke.pdf
- Oxfam briefing paper, *Causing Hunger: an overview of the food crisis in Africa*, which includes consideration of the role climate change is playing.
  www.oxfam.org.uk/what_we_do/issues/conflict_disasters/bp91_hunger.htm

7 Adapted from the Environmental Management Group, South Africa.

3.5 Disaster risk reduction

The number of disasters linked to extreme weather events doubled between 1980 and 2003. They now form well over half of all disasters. Part of this trend can be attributed to more people living in more hazardous environments, and by improved reporting. However, with scientists predicting that the ferocity of weather-related hazards will increase with climate change (IPCC 2001), the stark jump in the number of disasters suggests we are already seeing the first **climate change disasters**. Developing countries have already lost between 2 and 15 per cent of their GDP to disasters between 1990 and 2000 (World Bank 2004), so there is an urgent need for disaster risk reduction (DRR) to engage with climate change. However, to help communities adapt to climate change, DRR programmes must ensure interventions are sensitive to future climate-driven events, which are potentially more damaging and more frequent than any disasters lodged in the collective memory of communities.

This raises a number of practical challenges for the way DRR projects are designed and conducted, and for the way disaster risk management is organised and implemented by governments. If potential climate impacts are not considered, then DRR projects could be **maladaptive**, meaning they increase a community's vulnerability to future hazards. For example, when poorly constructed, inadequate flood defences in Bangladesh were overtopped in 1999, they trapped floodwaters and prolonged inundation leading to more damage (DFID *Key Sheets*). The tension between satisfying short-term DRR goals and addressing medium-term climate risks remains, but improved dialogue between the disasters and adaptation communities will help to bridge this gap.

CASE STUDY
Red Cross, Vietnam

An environmental preservation project conducted by the Vietnam Red Cross addressed two issues affecting the people living on the coast in Thai Thuy district of Thai Binh province. With eight to ten typhoon storms striking the coast of Vietnam annually, tidal flooding often breaches sea dykes and causes economic losses to the local population engaged in aquaculture. With climate change, the intensity of these storms is likely to increase and the breaches become more serious. The Red Cross project involved creating 2,000 hectares of mangrove plantations, which serve two important purposes. Firstly, the trees act as a buffer zone in front of the dykes, reducing the water velocity, wave strength and wind energy. This helps protect coastal land, human life and assets invested in development. Secondly, the new mangroves contribute to the production of valuable exports such as shrimp and crabs, high-value species of marine fish, mollusc farming, and the culture of seaweed for agar and alginate extraction. This offers new employment opportunities to help what was a vulnerable population improve their livelihoods.

Source: www.ifrc.org/WHAT/disasters/dp/activities/vietnam.asp

Ideas for Action

- Enhanced local preparedness to respond to climate-induced hazards is the key to developing appropriate interventions in the short-medium term. While on many occasions good DRR (see case-study) will help prepare communities for handling future climate risks, the following steps should be considered to ensure DRR projects adequately handle the effects of climate change:
- As climate change may cause weather-related hazards of greater magnitude and frequency than ever before, the design of DRR projects should involve soliciting advice from climate scientists, as well as understanding historical trends in weather patterns. Knowledge of climate science can be obtained by establishing working relationships with meteorological departments or with climate modellers at local universities. While it is too early to expect detailed predictions from scientists, finding out whether an area is likely to become wetter or drier, hotter or colder, or more or less subject to extreme rainfall events for example, will help tailor DRR projects to meet communities' needs over longer timeframes.
- To help communities recognise the need for projects that take into account climate change risks, disaster education programmes should also include modules on climate change. The modules should highlight adaptation options available as well as predictions of future impacts.
- Agencies already conducting DRR projects may want to consider how well these projects are addressing future climate change risks. However, climate-screening tools are in the early stages of development. The plan is that they should match scientific projections of climate change effects with current vulnerability trends, and then measure against the assets available for a community to adapt.
- As a first step, a risk mapping exercise could identify the communities living in marginal areas, who are effectively on the front line as climate stresses increase.
- Some development agencies have already produced tools for mainstreaming disaster risk reduction into programming. These tools could play a crucial role in integrating climate change adaptation into programmes. For example, Tearfund has a tool called Participatory Assessment of Disaster Risk (PADR), which helps local people assess and reduce disaster risk. Rather than developing new tools, existing tools such as PADR could be modified to highlight climate sensitivities and consider climate change risks and actions alongside disasters risks.

Resources

- Tearfund. *Mainstreaming Disaster Risk Reduction* tool.
  www.tearfund.org/webdocs/Website/Campaigning/Policy%20and%20research/Mainstreaming%20disaster%20risk%20reduction.pdf
- Tearfund. Participatory assessment of disaster risk tool, *Reducing Risk of Disaster in Our Communities.*
  http://tilz.tearfund.org/Publications/ROOTS/Reducing+risk+of+disaster+in+our+communities.htm.
- The Red Cross/Red Crescent Climate Centre, including the report of the 2nd Work Conference on Climate Change and Disaster Risk Reduction, held in The Hague, the Netherlands, in June 2005.
  www.climatecentre.org

- Climate Risk and Disaster Prevention, ProVention Consortium.
  www.proventionconsortium.org/?pageid=32&projectid=13
- IISD, IUCN, SEI (2003) *Livelihoods and Climate Change: combining disaster risk reduction, natural resource management and climate change adaptation in a new approach to the reduction of vulnerability and poverty.*
  www.iisd.org/publications/publication.asp?pno=529
- UN-ISDR Climate Change Disaster Reduction Infolink newsletter.
  www.unisdr.org/eng/risk-reduction/climate-change/rd-cch-infolink6-06-eng.htm
- Paper prepared for the World Conference on Disaster Reduction – 'Disaster Risk Management in a Changing Climate' (2005).
  www.unisdr.org/eng/risk-reduction/climate-change/rd-cch-infolink6-06-eng.htm
- Linking Climate Adaptation e-discussion 'Climate change and disasters'.
  www.linkingclimateadaptation.org/lcadiscuss
- Presentation on integrating climate change considerations into vulnerability and capacity assessments.
  www.climatecentre.org/?page=news_ext&pub_id=38&type=3&view=more
- *Institute of Development Studies Bulletin* (2005) 'Vulnerability, Adaptation and Climate Disasters'.
  www.ids.ac.uk/ids/bookshop/bulletin/bull364.html
- Special issue of the journal *Disasters* on climate change and disasters.
  www.blackwell-synergy.com/toc/disa/30/1
- *On Better Terms* A forthcoming resource looking at key climate change and DRR concepts, produced by the UN International Strategy for Disaster Reduction (ISDR) Inter-Agency Task Force.[8]

3.6 Organisational learning and mainstreaming

Mainstreaming climate adaptation is an important step in encouraging a wide range of sectors to consider how climate risks threaten the sustainability of their work. Section 4 considers the challenges of mainstreaming climate adaptation for development agencies, whereas this section outlines more practical learning steps for them.

An urgent priority for agencies is to increase awareness of the challenges posed by climate change among staff in headquarters, country programme offices and partner organisations.

Some agencies, particularly bilateral development agencies, are also developing methods to help screen their portfolios for climate change. These assess the significance of climate change to their work and provide entry points for incorporating adaptation and vulnerability reduction.

Partly responding to international commitments to integrate adaptation more broadly, strategic-level assessments, impact assessment and climate risk screening tools are currently being developed by a range of bilateral and multi-lateral development agencies (see box).

8 ISDR are also compiling a list of tools that a relevant for both DRR and climate change adaptation.

Screening of development agency portfolios – experience to date

A range of screening approaches have been piloted by development institutions to date. These have been based on approaches ranging from strategic review, environment and social impact assessment, risk assessment and vulnerability analysis. Examples range from review of policies and strategies (for example in Norad, Norway), reviewing programmes and projects (Danida, GTZ Germany, Swiss Agency for Development and Cooperation, World Bank) and through country case studies (OECD, DFID UK). All of these combine an awareness-raising and lesson-learning function; the aim is improve the climate resilience of development programmes and projects.

CASE STUDY
RC/RC Climate Centre

The Red Cross/Red Crescent (RC/RC) Climate Centre has invited all RC/RC National Societies to apply to its programme 'Preparedness for Climate Change – understanding and addressing the risks of climate change' (2006–2007). This programme, financially supported by the Netherlands Ministry of Foreign Affairs, Directorate-General for International Cooperation, strives to raise awareness among national societies and improve their ability to understand and address climate risks. The RC/RC Climate Centre sets out a four-stage model for national societies:

1 Organise a workshop on the risks posed by climate change
2 Assess the risks of climate change in the country and the repercussions for the priorities and programs of the national society
3 Build capacity for climate-resilient programming – participate in a regional training workshop
4 With external support, develop climate-resilient programmes.

Such a model may work for other development agencies if there is support from country programmes and local partners and, most importantly, an energetic individual *in country*. While more thought needs to be given to the way each stage might work in specific contexts, and how it can be presented as 'not *another* mainstreaming process', the model does provide a structure for developing climate sensitivity.

Source: www.climatecentre.org

Ideas for Action

- Ensure climate change is considered as part of programme design, monitoring and evaluation, particularly in poverty analyses where future climate vulnerabilities have rarely been considered.
- Conduct workshops and seminars in head offices, country programme offices and among local partners to highlight the specific challenges and opportunities posed by climate change.
- Develop specific materials that can be used at a community level to communicate climate change threats and potential adaptations simply and effectively. (See, for example: *GLOBALL – Common Goals in a Changing Climate* (2005), a short experimental video that broadcasts the voices of Argentinean shantytown dwellers and Mozambican and Bangladeshi farmers and teachers.) www.irs.bnu.edu.cn/dpri2005/PDF/16_Suarez.pdf

- Involve local partners in a collective process screening current and future projects for climate risks, but also identifying opportunities for learning and change within current activities.
- Encourage people within the organisation to join the Linking Climate Adaptation Network, which currently has over 800 members from developed and developing countries.
  www.eldis.org/climate/adaptation/network/lcaabout.htm
- Look for ways to integrate climate change into existing tools and methodologies – whether through project proposal and design guidelines, in risk assessments or in monitoring and evaluation frameworks. This will help integrate climate change into existing sectors without attempting to develop brand new approaches.
- Employ staff members specifically responsible for managing a climate-related change management process within the organisation. Pay particular attention to work with communities, where the staff members can provide technical inputs and practical guidelines for promoting climate awareness and action in development work.

Resources

- Tearfund: Mainstreaming disaster risk reduction tool.
  www.tearfund.org/webdocs/Website/Campaigning/Policy%20and%20research/Mainstreaming%20disaster%20risk%20reduction.pdf
- UNFCCC Background Paper on the *Application of Methods and Tools for Assessing Impacts and Vulnerability, and Developing Adaptation Responses.*
  http://unfccc.int/resource/docs/2004/sbsta/inf13.pdf
- Brief introduction to climate change adaptation on the Linking Climate Adaptation website:
  www.eldis.org/climate/adaptation/introduction/index.htm
- *Tiempo* – A weekly newsletter on climate change and development.
  www.cru.uea.ac.uk/tiempo/newswatch/mailing.htm
- IUCN/IISD/SEI/InterCooperation.
  Livelihoods and Climate Change Project: www.iisd.org/security/es/resilience/climate.asp
  Livelihoods and Climate Change Adaptation Tool:
  www.iisd.org/pdf/2006/security_lcc_adap_tool.pdf
- ORCHID Project on Climate Change and Disaster Risk Screening of Development Agency Portfolios – climate risk assessment of the DFID Bangladesh portfolio.
  www.ids.ac.uk/ids/pvty/climatechange/adaptationorchid.htm
- World Bank publication (2006) *Climate Risk Management – integrating adaptation into world bank group operations.*
  http://siteresources.worldbank.org/GLOBALENVIRONMENTFACILITYGEFOPERATIONS/Resources/Publications-Presentations/GEFAdaptationAug06.pdf

3.7 Networking and advocacy

As many NGOs do not currently have the capacity to tackle the challenges of climate change on their own, forming national coalitions and regional and international networks is a way of strengthening voices and sharing lessons. Networks of development and environmental NGOs already exist in a few countries, but there are still many countries where climate adaptation does not feature strongly on the political or development agenda.

Ideas for Action

- Government priorities for climate adaptation in many of the world's poorest countries are being outlined through National Adaptation Programmes of Action (NAPA). Tracking the progress of the recommendations and projects detailed in the NAPAs provides an opportunity to engage with policy-makers on climate change adaptation issues. http://unfccc.int/adaptation/napas/items/2679.php
- Advocate that climate change adaptation should be tackled explicitly through poverty reduction strategy papers and considered as a major threat to the achievement of Millennium Development Goals. This is important in countries which continue to see climate change as an environmental threat to be handled through environment ministries. Advocate that NAPAs and adaptation funds are linked to broader development processes at a national and international level.
- Use climate change as an opportunity to scale up current risk reduction programmes.
- Attend or organise a side event at the annual UNFCCC Conference of the Parties meeting, to promote the experiences of development agencies and their partners. This will help to raise the profile of development debates in the negotiations.
- Develop a compendium of voices from the grassroots, which illustrates people's experiences of living with climatic and environmental changes. This could form a strong advocacy tool as many still see climate change as a distant threat. See Tearfund's report (*Dried Up, Drowned Out*) and WWF's Climate Witness programme as examples.
- Raise awareness of linkages between DRR and climate change, and promote communication between the two communities, to avoid duplication of activities and to promote learning and sharing.
- Help to form national coalitions in developing countries (e.g. along the lines of the UK Working Group on Climate Change and Development) to promote awareness and raise the profile of climate change.

Resources

- The UK Working Group on Climate Change and Development (*Up in Smoke*).
  www.neweconomics.org/gen/news_upinsmoke.aspx
  www.iied.org/CC/projects/workinggroup.html
- To raise the profile of climate change in Bangladesh, a group of NGOs have begun an advocacy network.
  www.nccbd.org/network.html
- Stop Climate Chaos is a coalition of environmental and international development organisations, as well as women's organisations, activist groups and faith-based

campaigns, which 'aims to build irresistible popular pressure on politicians to act'.
www.stopclimatechaos.org.uk

- The Climate Action Network (CAN) is a global network of over 287 NGOs, working 'to promote government and individual action to limit human-induced climate change to ecologically sustainable levels'.
  www.climatenetwork.org
- Linking Climate Adaptation has a compendium of organisations working on climate adaptation (by region/sector).
  www.eldis.org/climate/adaptation/organisations/index.htm
- International Institute of Environment and Development 2006 publication on the links between climate change and development.
  www.iied.org/pubs/display.php?o=14516IIED&n=2&l=98&s=SGK
- 2006 Christian Aid report *The Climate of Poverty: facts, fears and hopes*.
  www.christian-aid.org.uk/indepth/605caweek/index.htm
- Practical Action (2006) *Just One Planet. Poverty, justice and climate change* and further details of its Stop Climate Injustice campaign.
  http://practicalaction.org/?id=stopclimateinjustice
- The Netherlands coalition of NGOs campaigning on climate change issues.
  www.hier.nu
- Tearfund Report (2005) *Dried Up, Drowned Out: voices from the developing world on a changing climate*, and Tearfund website:
  www.tearfund.org/Campaigning/Climate+change+and+disasters
- WWF's Climate Witness programme.
  www.panda.org/about_wwf/what_we_do/climate_change/news/witnesses/index.cfm

3.8 Research

While the majority of research on climate change adaptation to date has been conducted by universities and institutes, development agencies are uniquely placed to conduct action-oriented research within communities and to use this research for advocacy. Opportunities to acquire funding for such research are increasing, particularly as donors are realising the potential of collaborative action research among NGOs and research bodies. The involvement of development NGOs in research helps to ensure that research findings have an application and that they promote sustainable community-centred benefits. As the topic of adaptation to climate change is so new, the potential for research is vast.

Dr Anthony Nyong conducted an Africa-wide consultation in 2005 on the proposed Climate Change Adaptation in Africa Research and Capacity Development Programme (CCAA) and on priorities for research and capacity development. His report, based on stakeholder interviews in 25 African countries, is available online:
www.idrc.ca/en/ev-94509-201-1-DO_TOPIC.html

CASE STUDY
IDS/ActionAid, Kenya

The Institute of Development Studies and ActionAid International, as part of the Linking Climate Adaptation Project, organised a workshop in Kenya in March 2006, entitled Climate Adaptation Challenges: Building Capacity for African-based Research. The workshop brought together a large number of African adaptation researchers for the first time. Researchers were invited to the workshop on the strength of short concept notes sent to the organisers beforehand. Those who submitted successful notes were invited to attend the workshop as part of four working groups: (1) Community-based adaptation (2) Adaptation in key sectors, (3) Seasonal forecasting and early warning, (4) Strengthening capacity and networking. Short summaries of the participants' concept notes and reviews of the working group can be found in the report available online:
www.linkingclimateadaptation.org/webx?293@880.xRhoa816kZG.0@.eecf427

Ideas for Action

Development agencies can link with academic institutions in the north and south to facilitate action research and learning on climate change adaptation. The following gives examples of some of the larger, more recent research programmes on adaptation in a development context.

- **Climate Change Adaptation in Africa Research and Capacity Development Programme (CCAA)**: The CCAA is a joint programme of the Canadian International Development Research Centre (IDRC) and the UK's Department for International Development (DFID). Its aim is to create a body of skilled expertise in Africa to increase the ability of countries on the continent to adapt. The first call for research proposals closed in July 2006, but subsequent calls for proposals will be announced on the CCAA website: www.idrc.ca/ccaa
- **Advancing Capacity to Support Climate Change Adaptation (ACCCA)**: The ACCCA programme[9] administers proposals for projects in Africa and Asia that identified climate risks, developed risk communication materials, and promoted adaptation actions. A recent call for proposals was made in May 2006. The programme is funded by the European Commission and the UK Department of Environment, Food and Rural Affairs. www.start.org/Program/accca.html

9 Led by the global change SysTem for Analysis, Research and Training (START), and the UN Institute for Analysis, Research and Training (UNITAR).

4 Summary: challenges and debates for development agencies

Summary

- Development Agencies need to raise awareness among partners and make their programmes more resilient to climate change impacts. They also need to advocate for action by others on climate change and adaptation.
- Development NGOs will need to plan their adaptation activities carefully to ensure that they are consistent with poverty reduction policies, plans and programmes. This may require strategic assessment of the role of adaptation in their programmes, as well as supporting mainstreaming in developing countries.
- The focus of international negotiations in the UNFCCC on climate change, rather than current climate variability, may not be helpful to development NGOs. However, they may need to engage with the debate so they can emphasise that the separation is not helpful in practical terms on the ground for poor and vulnerable groups. They can link climate change to other related areas such as disaster risk reduction and sustainable development.
- Vulnerable groups must work on climate change adaptation from the starting point of current variability. Integrating the impacts of future changes into vulnerability reduction remains a significant challenge at policy and strategic levels, as well as in communities and households.

This section sets out some of the issues facing development agencies in tackling adaptation in the context of their ongoing work. Rather than provide explicit recommendations, it intends to promote debate, internally and externally, on how to approach climate change adaptation, in order to develop considered future strategy and action. The main issues are presented as a set of axes, and shown in Figure 3 below.

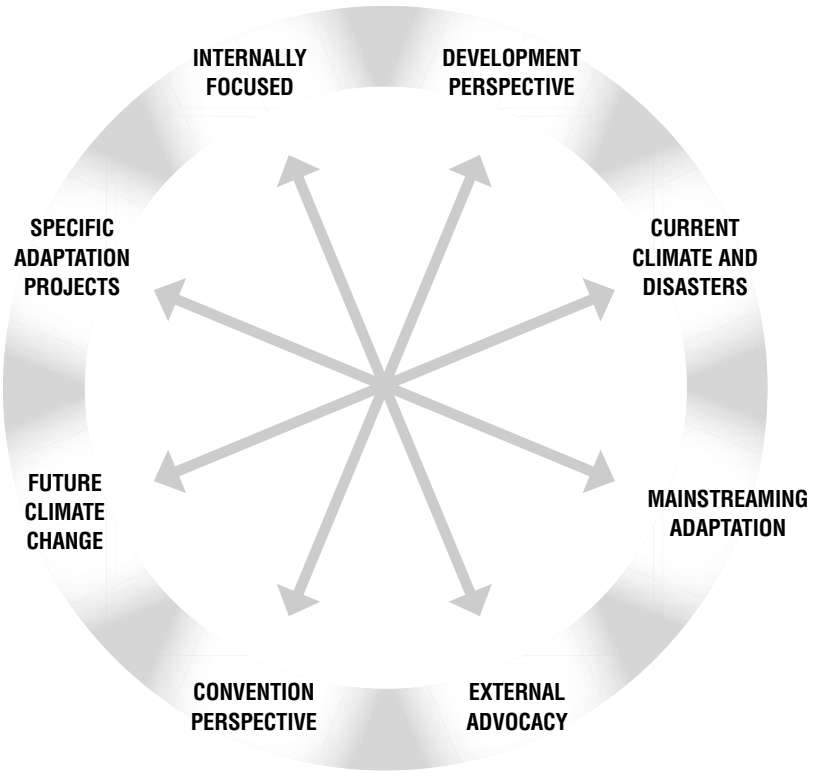


Figure 3
Issue sets that development agencies will need to address in forming a coherent strategy on adaption

4.1 Internal practice or external advocacy

KEY QUESTION *How can development agencies and their partners strike a balance between internal action on climate change and externally oriented advocacy on climate adaptation?*

Development agencies will need to ensure both that their work is suitably resilient to climate change impacts and that external advocacy work complements this. The impact of climate change on development programmes in terms of frustrating the delivery of poverty reduction goals gives a strong imperative to look across the organisation and its partners and improve resilience to climate risks. Programme goals may be directly at risk from climate change impacts, such as increased flooding or cyclone intensity. Equally, programme activities might inadvertently increase climate vulnerability, for example by developing critical infrastructure in climate-sensitive areas.

This gives a strong justification for incorporating adaptation concerns within ongoing development, not forgetting local partners. Resilience-building components of projects might then be developed to reduce exposure to climate-related hazards and help make poor people more able to cope and adapt. At one end of the axis therefore, the immediate imperative for development agencies is to develop strategies for assessing how climate change might affect activities and how these effects can be countered through adaptation.

The views of partners and communities in developing countries will be vital in such strategies. Presently, there is little awareness about climate change and its impacts, and climate change issues are given a low priority in the face of competing and urgent priorities. Ongoing and expanded awareness-raising remains an important first step in improving understanding of climate change and development of locally appropriate responses.

In addition, development agencies have played a vital role to date in raising the profile of climate change and poverty links with other audiences, and advocating for equitable international action on climate change. Continuing externally oriented advocacy campaigns (for example Stop Climate Chaos, and Up in Smoke) are crucial: they keep the pressure up for appropriate adaptation assistance for developing countries, ensuring that adaptation policies and actions target the poorest and most vulnerable, and linking adaptation with disaster risk reduction practices and institutions.

KEY POINT **Agencies need to raise awareness among partners and make their programmes more resilient to climate change impacts, at the same time as advocating for action by others on climate change and adaptation.**

4.2 Specific adaptation projects or mainstreaming

KEY QUESTIONS *Can or should adaptation be approached through discrete projects?*

Does the significance of climate change as a threat to development warrant a wholesale reappraisal of development activities to increase their resilience?

To what extent might adaptation be viewed as just the latest factor to 'mainstream' into development?

As described in earlier sections, there is now a consensus on the need for undertaking adaptation to reduce the negative impacts and take advantage of the positive impacts of climate change. However, there remains an important debate around how to integrate adaptation within the broader practices of sustainable development.

A growing number of projects and programmes are emerging globally that tackle climate change adaptation, including examples presented in section 3. Specific adaptation projects can be instructive in demonstrating the scope of impacts and the sorts of measures that make vulnerable groups more resilient to shocks and stresses. They can also improve understanding of how vulnerability to current and future climates are related, and the role of the climate within the wider range of shocks and stresses facing poor households and communities. As media and political interest in climate change increases, particularly in the UK, there may also be a political imperative for specific projects to demonstrate, and account for, a commitment to adaptation in developing countries that is commensurate with advocacy for tackling greenhouse gas emissions in industrialised countries.

At the same time, however, adaptation cannot be separated from other poverty reduction and sustainable development efforts because climate change acts upon existing vulnerabilities. As noted in Section 2, the impacts of climate change will exacerbate poverty and threaten the sustainable achievement of the MDGs. Consideration of climate-related issues at strategic levels such as planning processes and budgeting ('mainstreaming') can therefore ensure that development programmes and policies are not at odds with climatic factors both now and in the future (see box below).

Source: Adapted from ADB et al (2003) *Poverty and Climate Change: reducing the vulnerability of the poor through adaptation*.

Rationale for mainstreaming and integration of climate change adaptation

Many of the interventions required to increase resilience to climatic changes generally benefit development objectives. Adaptation entails the development of human capital, strengthening of institutional systems, and sound management of public finances and natural resources. These factors help to build the resilience of countries, communities and households to all shocks and stresses, including climate variability and change. They therefore constitute good development practice in themselves.

Mainstreaming climate issues into national development policies also ensures consistency between the needs of adaptation and poverty reduction. Separation of the two runs the risk of adaptation policies inadvertently conflicting with development and poverty policies, such as adaptive agricultural technologies that are too expensive for poorer farmers or that divert floodwaters into other areas. Conversely, development policies could inadvertently increase vulnerability to climatic factors, for example infrastructure development that alters river flows, or incentives for shrimp farming that result in the destruction of protective coastal mangrove forests.

There may be strong pressures for development agencies to undertake adaptation projects, but these efforts must also be integrated within wider sustainable development practices. Development NGOs may need to consider both how adaptation might be integrated at a strategic level in their work, and how it can contribute to the process of mainstreaming in developing countries and in other NGOs. Experiences from and links to the disaster risk reduction field could be particularly fruitful in this regard. Similarly, mainstreaming might benefit from lessons from the field on the sorts of institutions and policies that can support adaptation, as well as those that might increase vulnerability.

KEY POINT **Development NGOs will need to plan their adaptation activities carefully to ensure that they are consistent with poverty reduction policies, plans and programmes. This may require strategic assessment of the role of adaptation in their programmes, as well as supporting mainstreaming in developing countries.**

4.3 Climate perspective or development perspective

KEY QUESTIONS *How can development agencies help bring together the actors, policies, practices and terminology relating to climate change adaptation and sustainable development?*

Is it constructive for development agencies to introduce specific climate change terminology, particularly at community level?

In their 2004 paper for the World Bank, Burton and Van Aalst make a distinction between two dominant perspectives on climate change adaptation.

The 'convention perspective' dominates the UNFCCC and Global Environment Facility (GEF) and focuses on the global aspects of climate change. It is about climate change rather than current climate. Adaptation is therefore focused on the incremental element which climate change adds to the current variability of the climate. The costs and benefits of adaptation therefore relate to this incremental element, not the costs and benefits of adaptation to normal (current) climate and its variability. It has a top-down perspective whereby assessments are driven by future climate change scenarios from which flow impacts, and lastly adaptation to those future impacts.

The 'development perspective', on the other hand, is driven by concerns of vulnerability and poverty. It is concerned with present, as well as future, climate variability and extremes. It accepts all sustainable development benefits, not only the global ones, and makes no distinction about costs or 'who pays'.

The convention perspective described above is the extreme case, but it helps explain the difficulty in relating climate change adaptation to wider aspects of vulnerability. It may also explain the alienation of the disaster risk reduction and wider sustainable development community, and its related institutions, from adaptation debate and practice. The distinction in tools, language and institutions between climate change and development noted in Section 2 is also related to this divide to some extent.

Development NGOs operate primarily in the latter of these perspectives, and see little sense in separating current climate from future climate change.

A key concern for development agencies in reconciling these two perspectives is the value added in engaging at all with the language and institutions of the convention perspective. At a field level, the terminology of adaptation and focus on the future may cause confusion, and therefore would need careful explanation or even revision. The concepts related to adaptation may already be very well understood, however, particularly related to present vulnerability.

Nevertheless, engagement with the UNFCCC Convention, and its perspective, may remain important so that the vulnerability and poverty issues of the development perspective, as well as the needs of poor and vulnerable groups, are represented. Understanding and bridging these perspectives is therefore important for development NGOs to be able to engage at policy level.

KEY POINT **The focus of the international negotiations in the UNFCCC on climate change rather than current climate variability may not be helpful to development NGOs. But they may need to engage to show how their separation is not helpful for poor and vulnerable groups and link climate change to other related areas such as disaster risk reduction and sustainable development.**

4.4 Current variability or future climate change

KEY QUESTIONS *How can development agencies balance adaptation to longer-term changes with action to reduce present-day risks?*

How should partners view climate (current and future) in the context of other shocks and stresses to development?

How can development agencies build in resilience to future climate into current vulnerability reduction initiatives?

Some development agencies have been attempting to expand disaster risk reduction, which deals with current variability in climate, into the development work of their partners. Community-focused approaches to adaptation commonly take vulnerability to and coping with current climate as a vital first step to enhancing resilience to climate-related shocks. This is widely regarded as the basis on which to build resilience to longer-term shocks and stresses. However, there is limited experience to date in combining measures that manage and reduce present-day risks but are suitably flexible and robust to cope with an uncertain future climate.

Current disaster risk reduction initiatives and mainstreaming therefore provide an important avenue for development agencies to pursue, in deciding how to engage with climate change adaptation. Of crucial importance in finding a balance between current and future risk reduction is the participation of partners and vulnerable people themselves. This will also enable climatic factors to be gauged in relation to other shocks and stresses, avoiding adaptation being imposed from above, just because it is the 'latest development fashion'.

Combining current and future climate risks could also eventually become part of a wider risk assessment process that also incorporates other social environmental aspects currently undertaken as part of good development practice. A number of bilateral and multilateral agencies are piloting such approaches and OECD countries have pledged to integrate climate-risk screening more thoroughly into their programmes in the future.

KEY POINT **Vulnerable groups must work on climate change adaptation from the starting point of current variability. Integrating the impacts of future changes into vulnerability reduction remains a significant challenge at policy and strategic levels, as well as in communities and households.**

Water resources are highly vulnerable to climate change.

Photo: Jim Loring/Tearfund

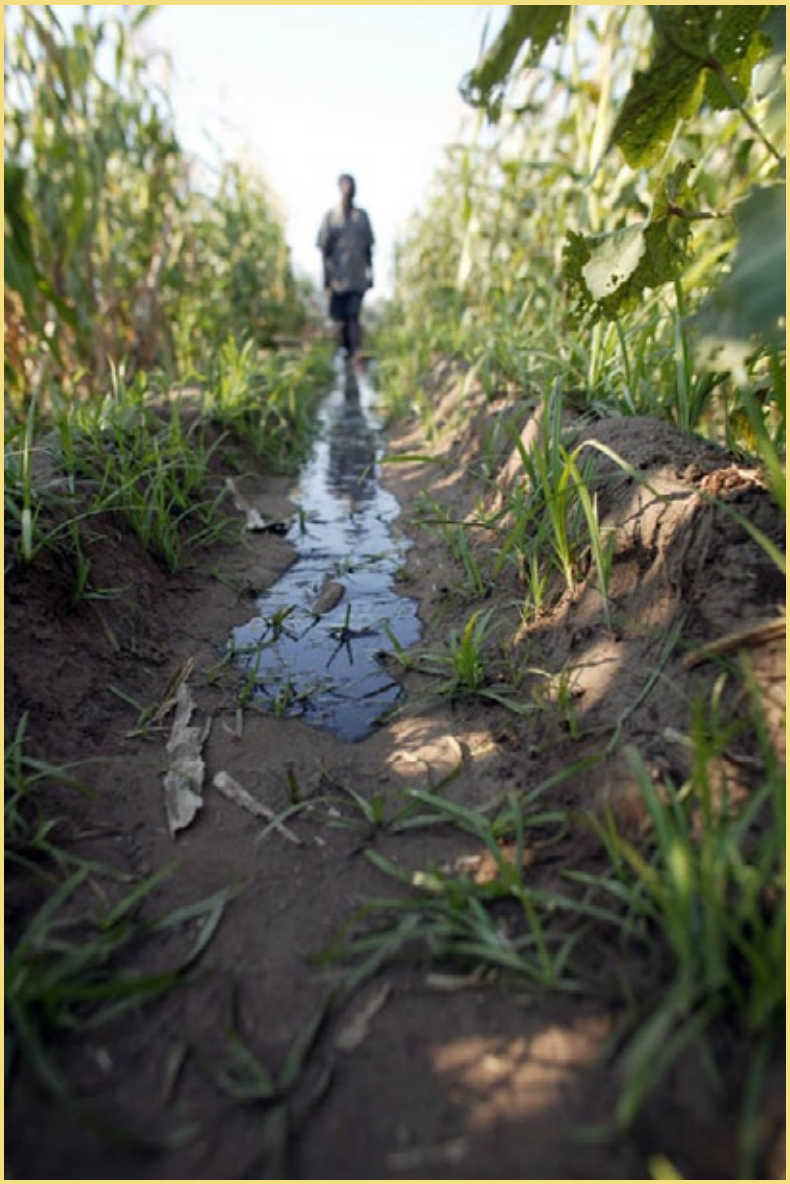
APPENDIX Likely regional impacts of climate change and linkages to vulnerability and adaptive capacity

Source: Adapted from IPCC 2001b, *Impacts, Adaptation and Vulnerability.*

	Likely regional impacts of climate change	Vulnerability and adaptive capacity
AFRICA	Increase in droughts, floods, and other extreme events would add to stress on water resources, food security, human health, and infrastructure, constraining development. Changes in rainfall and intensified land use would exacerbate the desertification process (particularly in the Western Sahel and Northern and Southern Africa). Grain yields are projected to decrease, diminishing food security, particularly small food-importing countries. Sea level rise would affect coastal settlements, flooding and coastal erosion, expecially along the eastern Southern African coast. Major rivers are highly sensitive to climate variations and may experience decreases in run-off and water availability, affecting agriculture and hydropower systems, which may increase cross-boundary tensions. Increase in frequency of some extreme events in some places.	Adaptive capacity is low due to low GDP per capita, widespread poverty (the number of poor grew over the 1990s), inequitable land distribution, and low education levels. There is also an absence of social safety nets, in particular after harvest failures. Individual coping strategies for desertification are already strained, leading to deepening poverty. Dependence on rain-fed agriculture is high. More than one quarter of the population lives within 100 kilometres of the coast and most of Africa's largest cities are along coasts vulnerable to sea level rise, coastal erosion, and extreme events. Climate change has to be recognised as a major concern with respect to food security, water resources, natural resources productivity and biodiversity, human health, desertification, and coastal zones. Adaptive capacity will depend on the degree of civil order, political openness, and sound economic management.
ASIA	Extreme events have increased in temperate Asia, including floods, droughts, forest fires, and tropical cyclones. Thermal and water stress, flood, drought, sea level rise, and tropical cyclones would diminish food security in countries of arid, tropical, and temperate Asia. Agriculture would expand and increase in productivity in northern areas. Reduced soil moisture in the summer may increase land degredation and desertification. Sea level rise and an increase in intensity of tropicl cyclones would displace tens of millions of people in low-lying coastal areas of temperate and tropical Asia.	Adaptive capacity varies between countries depending on social structure, culture, economic capacity, and level of environmental degradation. Areas of concern include water and agriculture sectors, water resources, food security, biodiversity, conservation and natural resource management, and infrastructure. Capacity is increasing in some parts of Asia, for example the success of early warning systems for extreme weather events in Bangladesh, but is still constrained due to poor resource bases, inequalities in income, weak institutions, and limited technology

(Continued)

	Likely regional impacts of climate change	Vulnerability and adaptive capacity
LATIN AMERICA	Loss and retreat of glaciers would adversly impact runoff and water supply in areas where snowmelt is an important water resource. Floods and droughts would increase in frequency, and lead to poorer water quality in some areas. Increases in the intensity of tropical cyclones would change the risks to life, property, and ecosystems from heavy rain, flooding, storm surges, and wind damages. Coastal human settlements, productive activities, infrastructure, and mangrove ecosystems would be negatively affected by sea level rise.	Some social indicators have improved over the 1990s including adult literacy, life expectancy, and access to safe water. However, other factors such as high infant mortality, low secondary school enrolment, and high income inequality contribute to limiting adaptive capacity. Areas of particular concern are agriculture, fisheries, water resource management, infrastructure, and health.
SMALL ISLAND STATES	The projected sea level rise of 5 millimetres per year for the next 100 years would cause enhanced soil erosion, loss of land, poverty, dislocation of people, increased risk from storm surges, reduced resilience of coastal ecosystems, saltwater intrusion into freshwater resources, and high resource costs to respond to and adapt to changes. Coral reefs would be negatively affected by bleachng and by reduced calcification rates due to higher CO2 levels; mangrove, sea grass bed, and other coastal ecosystems and the associated biodiversity woud be adversely affected by rising temperatures and accelerated sea level rise.	Adaptive capacity of human systems is generally low in small island states, and vulnerability high; small island states are likely to be among the countries most seriously impacted by climate change. Areas of concern are food security, water resources, agriculture, biodiversity and coastal management, and tourism. Islands with very limited water supplies are highly vulnerable to the impacts of climate change on the water balance. Declines in coastal ecosystems would negatively impact reef fish and threaten reef fisheries, those who earn their livelihoods from reef fisheries, and those who rely on the fisheries as a significant food source. Limited arable land and soil sanitisation make agriculture of small islands, both for domestic food production and cash crop exports, highly vulnerable to climate change. Tourism, an important source of income and foreign exchange for many islands, would face severe disruption from climate change.



TEARFUND

CHRISTIAN ACTION WITH THE WORLD'S POOR

www.tearfund.org
100 Church Road, Teddington, Middlesex, TW11 8QE
Tel: +44 (0)20 8977 9144

Registered Charity No. 265464

17711-(1006)