Climate adaptation in southern Africa: Addressing the needs of vulnerable communities

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Table of Contents

List of Acronyms

ACCCA	Advancing Capacity to support Climate Change Adaptation
AIACC	Assessments of Impacts and Adaptation to Climate Change
CEPA	Centre for Environment Policy and Advocacy (in Malawi)
CSAG	Climate Systems Analysis Group (University of Cape Town)
CTGC	Technical Council for Disaster Management (of Mozambique)
CURE	Coordinating Unit for the Rehabilitation of the Environment (in Malawi)
DFID	UK Department for International Development
DRR	Disaster risk reduction
DMA	Department of Disaster Management Affairs (of Malawi)
DMMU	Disaster Management and Mitigation Unit (of Zambia)
ENRNSC	Environment & Natural Resources National Steering Committee (Zambia)
ENSO	El Niño-Southern Oscillation
EWS	Early Warning Systems
FAO	UN Food and Agriculture Organization
FNDP	Fifth National Development Plan (of Zambia)
GCM	General Circulation Model
GEF	Global Environment Facility
GTZ	German Agency for Technical Co-operation
IIED	International Institute for Environment and Development
INAM	Mozambique National Meteorology Institute
INGC	National Institute for Disaster Management (of Mozambique)
IPCC	Intergovernmental Panel on Climate Change
LDCs	Least Developed Countries
MICOA	Ministry for Environmental Coordination (of Mozambique)
MTENR	Ministry of Tourism, Environment and Natural Resources (MTENR) of Zambia
NAPA	National Adaptation Plans of Action
NGO	Non-governmental organisation
OGB	Oxfam Great Britain
PARPA	Action Plan for the Reduction of Absolute Poverty 2006-10
SADC	Southern African Development Community
SEI	Stockholm Environment Institute
SIDA	Swedish International Development Agency
UCT	University of Cape Town
UNAIDS	The Joint United Nations Programme on HIV/AIDS
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development

Executive Summary

Southern Africa is faced by a number of weather and climate-related hazards, particularly cyclones, floods and droughts. The impacts and losses caused by these events are high because poverty and weak institutions make populations very vulnerable, with little capacity to prepare for and recover from these natural occurrences.

Human-induced climate change has caused an increase in the frequency and intensity of extreme events as well as gradual changes in the rainfall and temperature patterns. This is expected to continue to varying degrees under different climate scenarios for the future (based on the extent of greenhouse gas emissions). The need to respond to these changes is urgent as the climate change-related impacts are starting to emerge more rapidly than before. It is also important to understand how climate stress interacts with other existing stressors to increase vulnerability, for example compounding the impacts of both HIV/AIDS and water stress on agricultural livelihoods and food security.

Evidence suggests that the negative impacts of climate change are greater and expected to grow more rapidly in the developing world, especially in sub-Saharan Africa. However, many of the causal linkages and feedbacks within and between the natural and social systems are still being investigated. Based on existing and projected climate risks, focus is being placed on activities that reduce the sources of vulnerability and build resilience and preparedness, to complement more traditional relief efforts. This involves considering longer time scales and using new sources of information for selecting intervention and response strategies, which requires building internal capacity, fostering new collaborations and improving communication within and between organisations.

This study provides information for the Oxfam GB Regional Centre in southern Africa to make strategic decisions on how best to support people living in poverty to adapt their livelihoods in a way that makes them more resilient to climate change, recognising that capacity to adapt is not equal among all groups and targeted support is necessary. A thorough response to climate change, which builds on existing responses to disaster risk and natural climate variability, requires focussing on two aspects:

a) increasing and improving people's ability to prepare for, and respond to, extreme weather events (such as more frequent flooding) and increasing climate variability; and
b) investing in mechanisms and systems for adapting to gradual climate change (for example, where overall rainfall patterns in a region change and a particular crop is no longer viable).

This study takes a regional perspective but focuses mainly on national and local conditions in three of the countries where Oxfam GB works, namely Malawi, Mozambique and Zambia; drawing on existing scientific and local anecdotal evidence to investigate:

⇒ current understandings and impacts of climatic change in southern Africa;
⇒ how organisations and communities are responding to these changes; and

⇒ the challenges and opportunities that exist in preparing for and responding to climate change impacts (institutional, technical and socio-political).

Based on this analysis, there are a number of recommendations for how Oxfam GB (and others) might contribute to addressing climate change challenges and increasing adaptive capacity in the region (at various scales). The report concludes with a proposed way forward, including some suggestions for further research. The nature of this study (rapid and external) means that the challenge for Oxfam will be to relate the findings from this report to their existing programmes, strategies and mandate and find ways to operationalise this new focus and area of work across their institutional structure.

The findings of this study show that:

1. There are many complex relationships between changes in the climate and natural environment and the impact this has on people and their livelihoods. However, not all of these relationships are fully understood yet. This remains a notable gap between the supply and demand of climate change information. Practitioners want clear statements about causal relationships and local near-term impacts on which to base their intervention decisions, while scientists largely work on trying use the new and emerging climate science to determine the implications of climatic change on biophysical, social, economic, political and cultural systems, processes and entities at a variety of temporal and spatial scales, but often in the longer term. There is a need for these different communities of practice to work more closely together to fill this gap. This includes improving science communication by developing a range of climate information products targeted at specific users (according to organisational objectives).
2. Local communities have observed changes in the climate and their natural environment that have made them more vulnerable to food insecurity, health threats, water scarcity, and disaster situations (like flooding). This requires intervention in building capacity to respond to and plan for these emerging threats. In Mozambique the focus is still largely on disaster management, having suffered immensely from cyclone events and flooding in recent years. In Malawi the impacts of flooding and droughts on agricultural livelihoods are compounded by widespread deforestation and HIV prevalence, limiting the implementation of existing coping strategies during times of crop failure and food insecurity, such as collecting wild foods and charcoal production. In Zambia communities plagued by periodic flooding and droughts have noticed a shift in weather patterns over recent decades (for example changes in the timing of the rainy season) that have negatively impacted water availability and agricultural production.
3. National and local governments are starting to address issues of climate adaptation and disaster risk reduction, but this is still in the very early phases. Much of it is externally driven and supported by donors. There is an in-country shortage of relevant climate information and of people with the skills to apply it. There are also large problems of under-resourcing and poor coordination. Regional bodies, including SADC and the AU, are starting the process of establishing groups

mandated with addressing climate change, formulating policy on climate-related issues and engaging in international decision-making on adaptation financing. These are largely in the very early stages of development and progress is expected to be slow, especially in terms of translating this into action on the ground.

4. NGOs are starting to lobby on various climate justice issues, and some are already mainstreaming climate adaptation and disaster risk reduction activities into their programmatic work. However, there is a sense that the lack of government leadership and the confusing messages coming out of the scientific community are limiting progress on this. NGOs have an important role to play in progressing from climate change as an espoused priority to clear action on addressing climate change within a development context, by linking different information and actors across scales and places and testing the effectiveness of different interventions. NGOs are well placed to support local communities in documenting and voicing concerns about the climate impacts they are already experiencing and their demands for adaptation support to their national government and the international community.
5. Understanding nuances in the nature and level of vulnerability of groups and individuals is important in developing locally appropriate and effective adaptation strategies, including understanding different perceptions of risk that form the basis of response choices and patterns of behaviour. There is a need to comprehensively assess the robustness of existing initiatives in light of current and expected climate change, to ensure that developments being supported and encouraged are sustainable. This will require establishing institutional arrangements that facilitate closer relationships with national Meteorological Services and academics both nationally, regionally and internationally and/or building research capacity on these issues within the organisation (whether government, NGO or private sector).
6. There is a need and a clear opportunity to develop strategic partnerships for collaborative efforts and shared learning opportunities around climate risk management between a variety of NGOs and other actors. This requires improving communication and broader engagement with other civil society organisations, academic institutions and government. It will contribute not only to developing capacity for advocacy work but also, critically, to building capacity to supply the technical support needed to do climate adaptation.

Chapter 1: Introduction

Background

Adaptation has become an important topic for the climate change community and is gaining prominence as an item on development agendas[1]. Development can be viewed as a process of social change that involves realising collectively defined aspirations that is matched by the capacity to carry out this change. In this report, development is seen as part of people and systems' endogenous response to stimuli as well as exogenous intervention aimed at improving people's livelihoods. Development interventions can help to enable communities to cope better with existing stresses and hopefully adapt to future stress endogenously, which is critical at a time of rapid changes in the environment and climate. Equally, the failure to adapt could well undermine development and inhibit progress towards more inclusive and sustainable human development in the long term.

Adaptation is an ongoing process inherent in natural and social systems. When faced by changing circumstances, particularly when they become uncomfortable or undesirable, people, like plants and other animals, tend to change the way they are and/or do things so as to survive or benefit from the new conditions. In this sense adaptation is often reactive i.e. in response to a stimulus, which in turn has knock on and feedback effects throughout the system. As we build our understanding of climate change and how it is likely to impact negatively on current systems and practices, the need for investing in planned anticipatory adaptation is increasingly being recognised and acted upon. This needs to be done in conjunction with mitigation efforts to reduce greenhouse gas emissions and hence the extent of these human induced changes in the climatic system. Whether or not regions, countries, sectors and communities can successfully adapt to climate change will determine whether they are in a position to make the most of any opportunities created as a result of a changing climate, and reduce the extent of likely adverse impacts associate with these changes. In other words, adapting to climate change is critical and needs to be inherent in social and economic development.

This process of adaptation needs to be encouraged, enabled, supported and facilitated by those individuals and organizations in positions to do so, particularly as people recognize the value of proactive (as opposed to reactive) adaptation, taking action now to avoid unnecessary losses and expenses in the future. In addition to this we recognize that capacity to adapt is not equal among all groups (and neither are the contributions to causing these human induced climate changes) and therefore targeted support is

[1] Further readings on adaptation in general include Adger et al, 2005; Brooks et al, 2005; Fussel and Klein, 2006; Huq et al, 2003 and IPCC, 2007 and with reference to development, include AfDB, 2003; Christian Aid, 2006; Huq et al 2006; Simms et al, 2004, Simms and Reid, 2005 and Swart et al, 2003.

necessary. An adequate response to climate change and climate variability requires focussing on two aspects:

a) increasing and improving people's ability to prepare for, and respond to, extreme weather events (such as more frequent flooding) and increasing climate variability; and

b) investing in mechanisms and systems for adapting to gradual climate change (for example, where overall rainfall patterns in a region change and a particular crop is no longer viable).

Under climate change scenarios, extreme events are expected to increase in frequency and intensity and the nature of climate variability is expected to change. The need to respond to this change is therefore urgent as the climate-related impacts start to emerge more rapidly than before (IPCC, 2007). The links to development are clear, as climate impacts both directly and indirectly on food security, health and water supply among other issues. In addition, evidence suggests that the negative impacts of climate change are greater and expected to grow more rapidly in the developing world (IPCC, 2007; Pachauri, 2004; Tol et al, 2004). Table 1 highlights some of trends related to climate and development in Africa.

Description	Trends	The Impact on Africa
Change in rainfall patters, increases in temperatures and increasing frequency of extreme weather events exacerbated by Greenhouse gas emissions and ecological destruction, with severe impacts on critical infrastructure, agricultural yields and human lives	• Consensus around climate change moving to a more focused debate on impacts and mitigation or adaptation measures. • Better understanding of the behaviour of the complex adaptive systems involved, and of the relationship between demographic growth, urbanization, economic development, higher consumption and a finite stock of natural capital. • Focus on levels of investment in new low emission technologies, and related regulatory and fiscal measures. • Leading effects of the impacts of climate change in most-affected regions causing population movements and tension within and between countries.	• Current models deriving climate change impacts, suggest that Africa may be most at risk, with drought, desertification and heightened flood risks impacting on vulnerable, under-resourced societies. • Africa contains about 20% of all known species of plants, mammals and birds, and 15% of amphibians and reptiles. Biodiversity in Africa is under threat from climate change and other stresses. • Poor people, especially those living in areas of low agricultural productivity, depend directly on species and ecosystem diversity to support their way of life. Due to this dependency, any impact that climate change has on natural systems will threaten the livelihoods, food intake and health of such populations.

Table 1: Trends related to climate change in Africa

Source: Adapted from World Economic Forum (2008).

These expected changes in the frequency and magnitude of extreme events associated with human induced climate change is where the fields of climate adaptation and disaster risk reduction come together. Southern Africa is faced by a number of weather and climate-related hazards, particularly cyclones, floods and droughts. The impacts and losses caused by these events are high because poverty and weak institutions make populations very vulnerable, with little capacity to prepare for and recover from these natural occurrences. Focus is now starting to shift, first conceptually and then practically, from being ready to respond to these events when they happen, in the form of disaster relief and recovery, to preparedness and risk reduction. So instead of just helping people in times of emergency, institutions are looking at how to intervene in a way that addresses the source of vulnerability, which in part links closely with poverty reduction efforts. Disaster risk reduction is thereby one point of entry into both climate adaptation and development activities.

Finding ways of integrating development interventions with the emergent climate adaptation responses is therefore necessary in order not to duplicate efforts. However, caution should be exercised as evidence suggests that environmental issues have not been sufficiently integrated into development practices in the past, which has led to many of the problems that we face now, not least of all climate change. Climate change may present a suite of issues that are challenging to address within existing poverty alleviation remits, such as changes in ecosystem services but it also provides an opportunity for responding to development, disaster and environmental concerns in an integrated manner.

Study approach

This report provides contextual information on some of the challenges and opportunities in the region for integrating climate adaptation into ongoing programmes and activities. The aim of the report is to inform Oxfam GB (OGB)'s strategic direction of decreasing community vulnerability to climate change. It recognises that there is a need to look at both "community-based adaptation" (which refers to how local socio-ecological systems prepare for and respond to the impacts of climate change) and "disaster risk reduction" (that aims to reduce vulnerability through disaster preparedness). By addressing both of these angles the research will feed into OGB's goal of supporting the response of poor people, their communities and national governments to a changing climate.

The first purpose of the report is to outline the projected future climates for the region as well as people's perception of current change including current and likely future climate-related vulnerabilities. The second purpose is to give a broad overview of the existing activities and initiatives to address climate and disaster risks in the region at both the local scale and national scale, though the focus is more at the local scale. In order to do this, three countries, selected by Oxfam, were used as case studies, namely Malawi, Mozambique and Zambia, as shown in Figure 1. Within these countries the focus was on current and potential responses to climate change at the local level as well

as an overview of the relevant institutional landscape at the national level (including government, NGO, donor and civil society representatives). Individual country reports are available for the three countries. In this report the case study findings are integrated along thematic lines, together with existing literature. This is intended to provide input into developing a framework to guide OGB's integration of climate change into current programming.

Methodology

A desktop study was undertaken to present information on available climate change scenarios, climate risk and associated vulnerabilities. Much of this was drawn from the IPCC (that provides an international overview of the science and includes a regional chapter on Africa); the Climate Systems Analysis Group (that has downscaled climate change models to present local data) and the DFID Regional Climate Change Programme for Southern Africa (that aims to create an enabling environment for strengthening adaptive capacity and resilience to climate change across the SADC region over the next 3 years). The DFID study, that is being led by OneWorld Sustainable Developments, produced a scoping report in 2007 that addressed some of the key climate change issues in the region, particularly with regards to water, health and food security as well as linking to and additional work done on the climate impacts in these countries. The material in the report drew on national workshops from Namibia, Tanzania, Malawi and Zambia. The NAPA (National Adaptation Plans of Action) process has been undertaken in Malawi, Zambia and Mozambique and these documents provide some of the adaptation responses that countries feel should be prioritised.

The field research for this report was based on visits of between 6 and 9 days to Malawi, Zambia and Mozambique. The Oxfam country offices helped to contact relevant stakeholders who could be interviewed both at then national and local level, including representatives from NGOs, CBOs, government and civil society organisations. Some of the Oxfam projects were visited as well as other local organisations doing work on the ground linked to community development and climate related interventions and other stakeholders.

A semi-structured interview approach was used. An outline of the questions asked to national and local stakeholders are provided in Appendix A. In Malawi, 19 interviews and 4 focus groups were completed, in Zambia 11 interviews and 3 focus groups and in Mozambique, 11 interviews and no focus groups due to logistical challenges.

Case study context

While there are many similarities between the three adjacent countries, there are also notable differences. Some background information for Malawi, Mozambique and Zambia is provided in the table below in order to contextualise the findings presented in the following chapters.

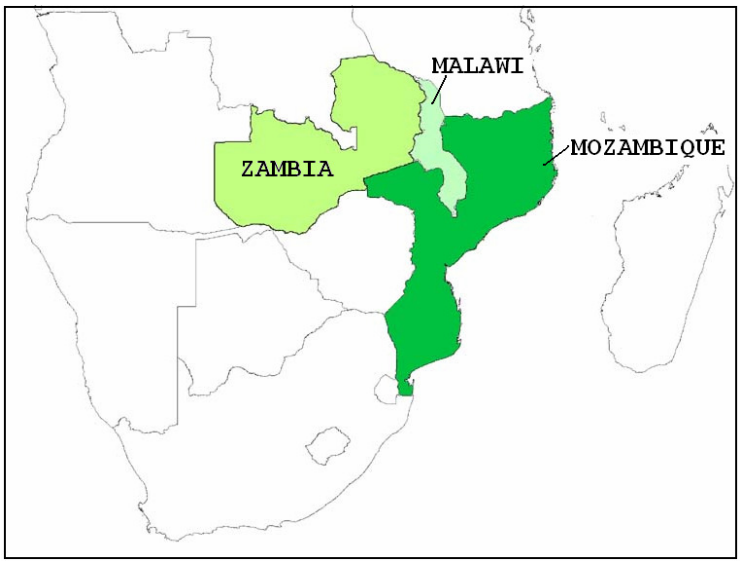

Figure 1: Map of southern Africa showing the three countries where in-depth field studies were undertaken.

	Malawi	Mozambique	Zambia
Estimated population (2006)	13 166 000	20 158 000	11 861 000
Total surface area	118 484km	801 590	752 618
Proportion of population with improved drinking water (2004)	73%	43%	58%
GDP PPP/capita ($)	458	555	767
Life expectancy at birth (years)	43	41	39
Population density in flooded areas (inhabitants/sqkm)	95	30	14
Arable land (% of land area)	20	4	7
Important environmental issues	Land scarcity & soil erosion Deforestation for fuelwood Water pollution & aquatic biodiversity	Water access & natural disasters Land use Protecting wildlife and forests	Copper mining & water & air pollution Deforestation & wildlife depletion Urbanisation

Table 2: Background information for Malawi, Mozambique and Zambia

Source: U.S. Census Bureau (2008) and UNEP (2008).

Poverty levels are high in all three countries. As can be seen in Table 2, life expectancy is low, with Malawi having the highest life expectancy of 43 years. This is exacerbated by high HIV and AIDS prevalence rates that result in low labour capacity and high dependency ratios, placing an additional burden on households. For example, in Malawi

in 2005 HIV/AIDS prevalence was estimated to be 14.1% of the adult population between the ages of 15 and 49 years, with women being disproportionately affected (UNAIDS, 2006).

All three countries are vulnerable to climate hazards. Malawi, Zambia and Mozambique all experience frequent drought and Malawi and Mozambique experience flooding. In addition, Mozambique's coastal location makes it vulnerable to cyclones. In Mozambique and Malawi, there are many areas with high population densities in low lying areas, creating exposure to flooding.

Food insecurity is high across the region. While food security depends on access, availability and utilization of food which is determined by culture, politics, infrastructure, markets and resources; availability of food is linked to household agricultural production which is often at the mercy of the timing and amount of rainfall. Southern Africa is known to have high climate variability both within and between seasons, increasing the challenge of food production. As a result, the ability to reduce climate risk and manage disasters is critical to increasing food security in all three of these countries. A changing climate is likely to make managing risk even more challenging than it is currently (Oxfam, 2007).

Figure 2: (Left) People digging sand from a river in Malawi to earn an income. This river was heavily flooded in January 2008. (Right) Women harvesting lettuce in a communal garden with drip irrigation.

Chapter 2: Climate change impacts and vulnerability

Climate change projections

Southern Africa has historically been exposed to droughts and floods but recent decades have seen the frequency and severity of these climatic hazards increase. In addition there are changes in climate trends. Some areas are experiencing increased or decreased average precipitation; others a shift in rainfall patterns, with the rainy season starting later than it used to in places and changes in the extent of dry spells in others; and many

places are experiencing increasing average and maximum temperatures. In addition, there are many places where we do not yet understand if and how the current climate is different from the past climate because there is limited weather station data (both spatially and temporally) and/or limited human capacity means that scientists have not yet analysed the data.

Although there are gaps in our collective understanding of the climate there is a lot of work that has been done looking at trends in the historical climate as well as exploring projections of future climate change. An assessment of historical rainfall patterns over southern Africa shows statistically significant increases in the length of the dry season during the period 1961-2005 (Tadross, et al., 2007). Regional changes in temperature show an increase in average temperature over most parts of southern Africa. Extremes in maximum temperature have increased more than the extremes in minimum temperature which is an important consideration for agriculture. The southern parts of Zambia have been shown to exhibit a decreasing trend of annual rainfall during the last 30 years (MTENR, 2007).

Projections of future climate change consider how an increase in greenhouse gases is expected to impact on the climate system and alter the climate trends. This is achieved using General Circulation Models (GCMs) that have been developed to project possible future climates based on different greenhouse gas scenarios and complex earth-atmosphere interactions. As such GCMs provide a means of generating information on the range of plausible future climatic conditions.

The Intergovernmental Panel on Climate Change (IPCC) has served as an international science assessment process that has consolidated and analysed outputs from 21 GCMs. Findings from the fourth assessment were released last year (IPCC, 2007). One of the main conclusions was that global temperatures have risen at the current rate because of the impact humans have had on the natural system through the increase in greenhouse gas emissions. The key attributes and directions of change expected for Africa are summarised in Box 1.

Some of the details of expected climate change over southern Africa include anticipation of a much hotter climate, with a temperature increase in the range of 4-6°C by 2100 and a 10-20% reduction in precipitation by 2050 (IPCC, 2007). Higher sea surface temperatures are expected to lead to an escalation in the frequency and intensity of extreme events (e.g. tropical cyclones). Flanked by large water masses (the Indian and Atlantic oceans), southern Africa is extremely vulnerable to these events. A rise in sea surface temperature over the eastern Pacific, for instance, has been shown to cause decreased rainfall over southern Africa through the effects of the El Niño-Southern Oscillation (ENSO), which is projected to increase (Stige et al., 2006). This has negative consequences for wheat and maize production in the region.

Box 1: Key attributes of the IPCC's Fourth Assessment Report for Africa

- Warming is *very likely* to be larger than the global annual mean warming throughout the continent and in all seasons, with drier subtropical regions warming more than the moister tropics.
- Annual rainfall is *likely* to decrease in much of Mediterranean Africa and the northern Sahara, with a greater likelihood of decreasing rainfall as the Mediterranean coast is approached.
- Rainfall in southern Africa is *likely* to decrease in much of the winter rainfall region and western margins.
- There is *likely* to be an increase in annual mean rainfall in East Africa.

Source: Christensen et al. 2007, p.850

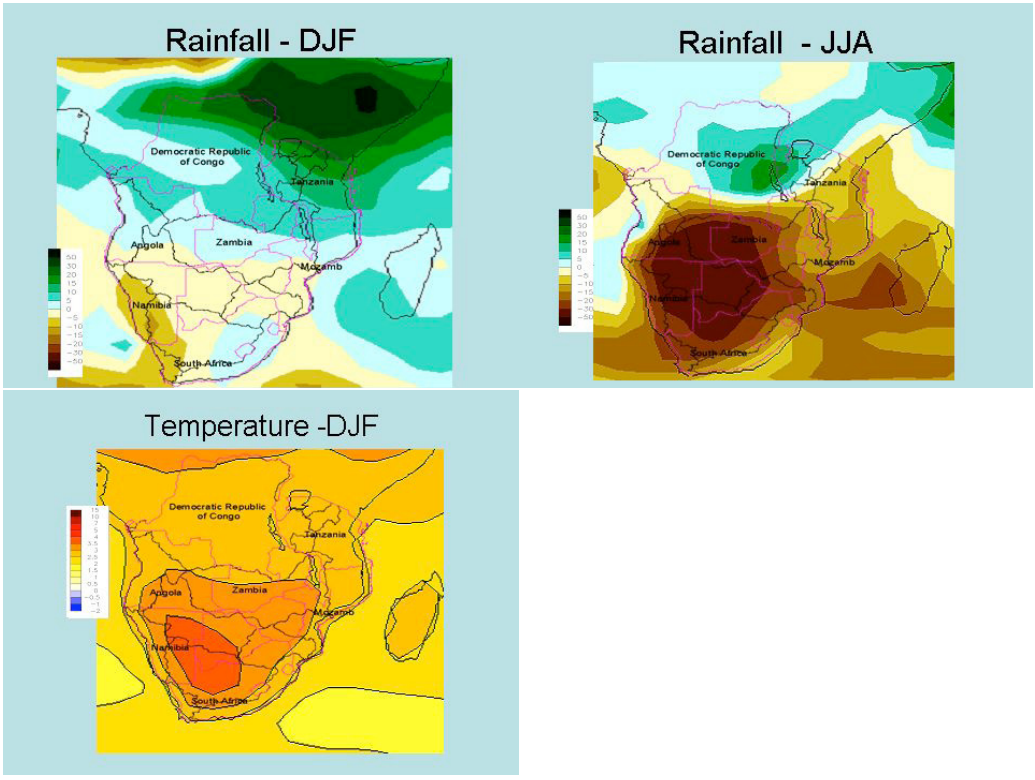

Figure 3: Maps of southern Africa showing changes in summer rainfall (DJF – December, Janurary, February) (top left), winter rainfall (JJA-June July August) (top right) and summer average temperature (bottom), projected for 2050.
Source: IPCC, 2007

Although there are broad regional climate scenarios from the IPCC and other sources, downscaled climate scenarios that give more specific details about the timing and nature of climate change in specific locations are not used as widely (See Box 2). Finer scale climate change information is deemed necessary for understanding the dynamic nature of local vulnerabilities and for developing suitable adaptation options that are robust to a range of possible futures for the area, but as of yet is not being used by most actors working on climate adaptation issues in southern Africa. A process of awareness raising, sensitization and training for both information providers and users is necessary for this

to change. Many of the national meteorological services are mandated to focus on collecting, analysing and archiving observed weather data, generating weather predictions and issuing early warnings of extreme weather events and do not have the capacity to undertake climate change assessments. For example, the Mozambique National Meteorology Institute (INAM) collaborates with the National Institute for Disaster Management (INGC) and other actors working on disaster management using the daily weather forecast, which is disseminated within communities. There are currently attempts to engage outside stakeholders, including researchers from the University of Cape Town, in developing more detailed climate change scenarios for Mozambique. This is a positive step if the external researchers are able to collaborate with local researchers to strengthen national capacity. In Zambia, the Meteorological Department has been involved in disaster risk reduction programs through support from both NGO's and government, although this only really gained momentum during the recent 2007/2008 floods. There has not yet been any work within Malawi or Zambia on developing and disseminating downscaled climate change scenarios.

Box 2: Downscaled climate change scenarios

There is growing recognition of the need for climate information at finer scales than GCMs provide. This is itself a driver of the volume of work aimed at downscaling climate model information for local and regional decision makers. These downscaled climate change models take model output from GCMs and interpret them in relation to local climate dynamics (Tadross et al., 2005).

Two approaches dominate the downscaling efforts in Africa, each based on a specific set of assumptions and methodologies: dynamical downscaling (also known as regional climate models: RCMs) and empirical downscaling. Dynamical downscaling is a computationally and technically expensive method, a characteristic that has limited the number of organisations employing the approach. One example, PRECIS, a product of the UK Met Office, relies exclusively on the Hadley Centre's GCMs at present, and is the most widely used downscaled model in Africa.

Empirical downscaling makes use of the quantitative relationships between the state of the larger scale climatic environment and local variations sourced from historical data. By coupling specific local observed climate data with GCM output, it provides a valuable solution to overcoming the mismatch in scale between climate model projections and the unit under investigation. Empirical downscaling can be applied to a grid or to a particular meteorological station. The latter sub-set of empirical downscaling is more common and referred to as statistical empirical downscaling. Empirical downscaling is less computationally intensive than dynamical downscaling, an important consideration in the African context.

The Climate Systems Analysis Group (CSAG) (www.csag.uct.ac.za), based at the University of Cape Town, South Africa, operates the pre-eminent empirical downscaled model for Africa and provides meteorological station level responses to global climate forcings for a growing number of stations across the African continent. This data is available through the CSAG website and can be interpreted through the Climate Change Explorer Tool, available through www.weAdapt.org .

In 2004 the Zambia Meteorological Department embarked on the RANET Project, to assist rural communities acquire access to FM radio with the intention of disseminating climate (seasonal forecasts) and weather information (5 day forecasts) in a timely manner in order, among other things, to assist them in the planning of their agricultural activities. From the communities interviewed in Choma and Mazabuka, RANET is currently not very effective as most of the communities have not been able to access information to help in pre-season agricultural planning. In some cases, those with access to RANET programmes via radio do not seem to know how to interpret the information and take appropriate measures accordingly. This is mostly due to a lack of resources to buy crop seeds that will withstand forecast dry spells within a season. Alternatively, some do not trust the forecast and rather follow tradition forecasting methods. Some also pointed to the fact that since they are so poor they can't afford to buy batteries for radios and RANET meetings are rarely organized in most of these villages.

Local understanding of climate variability and change

In Mozambique, people are aware of the cyclical nature of droughts and big flood events. All interviewees noted the observed changes in frequency and intensity of these events, though with some variation in the length of the cycles. Local groups have noted that they have had to change their crop cycles to adapt to the changing rainfall by planting two months earlier and that crop failure is a constant risk. People also make reference to more frequent and intense cyclone activity based on the occurrence of several category 4 cyclones in less than 3 years.

In Zambia, farmers in the Monze District have recognised a general reduction in length of growing season and shifts in the onset of rainfall season. A report that emerged from the AIACC programme (Assessment of Impacts and Adaptation to Climate Change) recorded community awareness about floods, their vulnerability to climate stresses and their response strategies. Most respondents in Gwembe district in southern province remember the worst flood years as 1973/74, 1984/85, and 2002/03 (MTENR, 2007). All three of these years had an annual rainfall total of above 889mm whereas the average rainfall is between 400 and 600mm a year.

Practitioners and government officials in Zambia are expecting the current trend of increasing frequency and intensity of extreme weather to continue, making the need for longer-term risk reduction responses more important. In addition, scientific consensus is growing on the high levels of vulnerability to climate change within the region, making better climate modelling, forecasting and risk communication methods and tools, tailored to aiding decision-making at different levels, a high priority.

In Malawi, people have noticed a clear trend of declining rainfall, and a consequent increase in the frequency of food insecurity, across recent generations. Communities have observed that rains are coming in more intense events, with the same volume of rain said to fall now over a shorted time than previously, which is associated with more

flood events. Also, the timing of the onset of the rainy season and the ending of the season has changed. A community outside Lilongwe explained how they used to receive rain between October or November and April, whereas now they are experiencing more years where they only receive rain between December and February. Even compared with 10 years ago people see the situation as being worse now, linking changes in climate to deforestation, soil infertility and growth in the local population. This causal linkage between climate change and deforestation is based on anecdotal evidence. There is some scientific evidence to suggest that large scale deforestation leads to changes in local and regional climate (particularly relative humidity and temperature), affecting rates of evaporation and extent of cloud formation (and thereby rainfall), but more research is needed to explore this in the case of Malawi.

More extreme temperatures in the form of hotter maximum temperatures in the summer and colder minimum temperatures in the winter have been observed in Malawi. People talk of these changes causing water shortages in times of great heat, as demand increases and supply decreases. They also mentioned an increase in the risk of uncontrolled fires and burn accidents (especially in children) when it is very cold as people are trying generate heat, particularly in the urban and peri-urban areas.

Figure 4: An image from a village in southern Zambia. Integrating scientific ideas with indigenous knowledge is an important step in developing appropriate adaptation strategies.

These different types of indigenous knowledge, perceptions of risk and experiences of changes in the climate are critical in supporting local livelihood adaptation. The challenge remains in linking these observed changes (documented as qualitative data) to the quantitative scientific data and distinguishing the climate change signal from the long term natural climate variability. This is considered important for discussions around attribution, responsibility and adaptation financing (including issues of additionality), but it is often argued that in terms of addressing vulnerability and reducing risk, this delineation between climate change and variability is not essential.

Within the NGO sector in Malawi there appears to be considerable confusion regarding the fundamentals of climate change and a general frustration regarding the lack of clear messages on climate change (particularly associated with causal relationships) coming from the scientific community that can be used by practitioners. People are struggling to distinguish between climate variability and climate change, largely because the distinction is not being made between natural and human-induced shifts in the climate system. Many seem to think that climate change refers only to what might happen in the future and not a new understanding of and explanation for changes that have already been observed.

Key vulnerable sectors

There are many complex relationships between changes in the climate, the environment and the impact this has on people and their livelihoods. However, not all of these relationships are fully understood yet. It is important to remember that global environmental change, climate change, vulnerability and sustainability sciences are all fairly new fields of research and so many more questions than answers exist, particularly when it comes to conclusive statements on cause and effect relationships. The Intergovernmental Panel on Climate Change (IPCC) clearly charts the progress of the scientific community in slowly developing stronger evidence-based conclusions on the nature and extent of climate change and the associated impacts. This section outlines some of the sectors in southern Africa identified to be most vulnerable to climate change, including examples of how this vulnerability plays out in the three case study countries. These vulnerable sectors are not dissimilar to the key impacts that were outlined as being of greatest relevance for Oxfam worldwide in 2006 (Lorimer, 2006).

Agricultural production is frequently referred to as a vulnerable sector in terms of the expected impacts of climate change. This is due to the fact that the majority of agricultural production in southern Africa is rain-fed and crops rely directly on the timing and intensity of rainfall. In addition, crop yield depends on soil moisture, evapotranspiration and heat stress. Some of the climate change impacts expected include a shift in the land area suitable for agriculture and a decrease in the growing seasons and yield potential. Subsistence-based farming systems are expected to be at greater risk than the commercial sector that is often irrigated and thereby able to manage reductions in rainfall.

Local food supplies are projected to be negatively affected by decreasing **fisheries** resources in large lakes due to rising water temperatures, which may be exacerbated by continued over-fishing. **Food insecurity**, and specifically access to food, is expected to be increase as a result of climate impacts on infrastructure, food storage and rising food prices.

The type of adaptations that will reduce the impact of climate change on agriculture could include agricultural diversification (either changing crop varieties or staples or

moving from one cash crop to several subsistence crops with some cash crops on the side), harnessing water-efficient irrigation technologies and conservation agriculture. It is also expected that pests and pathogens might change with temperature and moisture changes, causing exposure to new threats for which there is no knowledge and technology for preventing or treating. For example, in Tanzania, pest damage has increased in banana plants which could be linked to increasing plant stress caused by the drying trend experienced in the region, leaving the plants more vulnerable to attack (OneWorld, 2008).

Figure 5: (Left) Collecting water and (Right) women sorting grain for household consumption

Water availability is an equally pressing concern, with between 75 and 250 million Africans likely to be exposed to an increase in water stress by 2020 due to climate change (IPCC, 2007). If one acknowledges that demand for water is expected to grow and water supply will not be adequate to meet this demand, it is clear that negative impacts on livelihoods are likely to increase, be it through an inability to irrigate crops, water livestock, the spread of water borne diseases, the burden of household labour of walking far distances to collect water for domestic use, etc. Part of the reason for increasing stress is the low water storage capacity rather than simply a decrease in the total rainfall amount, particularly if rainfall events become less frequent but more intense. As Washington et al. (2004, p8) note: "Future economic development across the African continent has a high level of dependency on water availability… and yet societal resilience is not improving".

Parts of southern Africa, including the Kalahari Desert system and savannah systems, are expected to face extended **drought** periods. Access to water is therefore important and supporting strategies such as irrigation could reduce the dependency on rainfall and could improve food security (OneWorld, 2007). Many people refer to the drought of 1991-92 as the worst in recent history, affecting most of the southern African region. During that season, cereal output in the Southern African Development Community (SADC) region with the exception of South Africa fell from an average of 11.3 million to 6.2 million tonnes, necessitating extensive food imports (FAO, 2004).

In the last seven years of this decade the region has had to endure droughts in the rainy seasons of 2000/01, 2001/02 and 2004/05, while floods have occurred in 2005/06 and 2006/07. On average Zambia experiences two to three drought years in a decade (USAID/Zambia, 2003). In Mozambique, INAM noted that severe droughts used to occur in breaks of 7 to 11 years, and that drought of smaller intensity occurred more regularly. Now, however, the country experiences drought almost every year, with particular vulnerability in the southern region.

The impact of **flooding** in the region is often devastating. Heavy rains are accompanied by strong winds in many areas, which cause severe damage to houses and crops. Heavier tropical storms could bring extensive flooding to the eastern coastal regions and a number of the large river basins, including the Zambezi. Severe flooding affects many areas in Malawi, Mozambique and Zambia, often causing: temporary displacement; the loss of infrastructure, including housing and roads; the contamination of water sources leading to a number of health problems; and soil erosion that affects people's farming plots.

Flooding can become a vicious cycle as flood events lead to river channels silting up, which in turn leaves the area more vulnerable to future flooding. Ports based in river mouths are particularly susceptible to siltation and this may jeopardize both the local economy as well as areas serviced by the harbour's imports and exports. Beira (Mozambique) is an example, where Zimbabwe, Zambia, the DRC and Malawi – in addition to Mozambique – are all affected by the functioning of the port.

The floods of 2000 had an unequalled impact on the lives of many people particularly in certain areas of Mozambique, where the cost of the combined impact of the floods and the cyclones in 2000/2001 was estimated at 600M US$. More than 500,000 persons were displaced and vital infrastructure was destroyed causing a large negative impact on the national economy. At the sub-national level it is difficult to understand the impacts as costs and causalities were reported regionally without necessarily reflecting risk within communities, particularly in more isolated areas.

Human health is predicted to be adversely affected by projected climate change. Increasing temperatures will extend the habitats of disease vectors such as malaria. More intense droughts and floods will increased the frequency of epidemics and enteric diseases where sanitation is poor. Increased temperatures of coastal waters could aggravate cholera epidemics in coastal areas. The high prevalence of HIV and AIDS is likely to decrease capacity to adapt to climate change impacts even further (Ziervogel and Drimie, 2008). The links between poor health and food security are a key concern illustrated by a survey undertaken in Mozambique where 45% of respondents from AIDS-affected households said they had reduced the area under cultivation and 60% said they had reduced the number of crops grown (Chapman, 2007). Unfortunately the direct links between health and climate change are not yet well researched in the region.

It is important to recognise different levels of vulnerability within communities and even within households, associated with gender, age, HIV status, ethnicity, etc. Women take on much of the burden associated with health and food security challenges in rural areas. It is therefore important to understand how best to support women in adapting to climate change. It should also be recognized that within certain communities some people or groups are more vulnerable than others. In Malawi, women spoke of large numbers of women within their community having to resort to sex-for-food transactions in times of high food insecurity, which leads to a dramatic increase in the spread of HIV. HIV+ people are in many ways more vulnerable to the impacts of climate changes and weather extremes, for example they need to maintain good nutrition to avoid rapid health decline, but this is almost impossible in time of food insecurity due to poor rains, and due to considerable weight loss and weak immune systems AIDS sufferers are more sensitive to cold temperatures and susceptible to secondary diseases and infections (e.g. water borne diseases in times of drought). Another example given in Malawi is that people with AIDS are too weak to build contour ridges on their farming plot and so their land becomes increasingly infertile, leading to a greater risk of food insecurity and thereby poor nutrition and more rapid physical degeneration. In this context the recognition of cultural and social dynamics is of paramount importance when supporting adaptation to climate change.

Biodiversity and ecosystem functioning are directly impacted by escalating global temperatures and changes in precipitation that are likely to increase extinction rates and reduce species diversity. Urbanisation and agricultural expansion contributes to this as less land is available for species movement and conservation. Many livelihoods in southern Africa are supported by drawing on the natural environment and the associated ecosystem goods and services, whether for firewood, forest products, wild plants for medicinal use and food. Coupled with land use change and unsustainable development practices, climate change impacts are likely to impair ecosystem functioning and hence diminish ecosystem benefits to humans.

Linking climate and livelihoods

When extreme weather events occurs, whether drought, flood, or cyclone, the livelihoods of millions of people can be severely disrupted. It is very likely that these weather-related disasters will increase (associated with increasing climate variability). This requires planning to prepare communities, making them more resilient to these types of events, thereby minimising associated losses and livelihood disruptions.

In Mozambique there is a resettlement approach, that moves people from transition camps to final resettlement centres after extreme events but this needs major improvement. It is necessary to develop resettlement approaches that allow farmers to use the farmland in the lower fields during the non-critical months of the year (i.e., when floods and cyclones are not common), and relocate during the times of the year when life on the floodplains is unbearable. The relocation of communities to less

vulnerable areas is an issue that requires special consideration. A recent Oxfam study indicates that the resettlement process and transition camps often do not have crucial services accessible, such as education and health. In addition, the resettlement process, many stakeholders believe, has been challenged by limited fertility of soils where communities are resettled, forcing many communities to move back to the floodplains after floodwater retreat for farming.

In Zambia, the impacts of these droughts and floods have included widespread crop loss, outbreaks of human and animal diseases, dislocation of human populations and destruction of property and infrastructure. In 2004/05 and 2006/07, the affected populations numbered 1,232,661 and 1,443,583 persons respectively. Droughts have also resulted in reduction of ground water resources thus lowering the water tables and thus drying of boreholes and streams. The loss of houses, household properties, livestock and animals due to climate related factors has also negatively affected the communities. Communities have been relocated from their old places. The increase in extreme rainfall events has forced most communities to resort in cutting down of trees for charcoal production and using the money generated by charcoal sales to supplement food and pay children's school fees. The increase in populations near streams has negatively impacted on the riparian ecosystems. Rural women and children in Zambia are more vulnerable to climate variability and change due to cultural customs where women are required to do all the daily household chores (like looking for food, fetching water and fire wood). As Mrs Mumba said,

> *We are more vulnerable as we are always in the field and the men always head into town during disasters.*

Figure 6: (Left) Transporting charcoal and (right) a girl eating fruit from the baobab tree in Malawi

In Malawi, communities speak of how years of low rainfall and/or untimely rainfall lead to crop failure, causing a local food insufficiency. People have to spend the little capital they have on purchasing food and this places strain on local businesses as the money in circulation decreases. Many men in the rural areas move into charcoal production as an alternative livelihood strategy. This however comes with a whole set of

problems associated with deforestation, including decreased water retention, soil erosion, loss of biodiversity, etc. It also leaves women having to take on more responsibilities in the fields. People, mainly in urban and peri-urban areas, look to take on casual work as a source of income and in times of severe food insecurity women resort to sex for food transactions, which dramatically increases the spread of HIV and ultimately leads to more orphans that the community struggle to adequately support. Drought years lead to water shortages as local sources dry up and women and children have to walk long distances to alternative sources, which are often unprotected wells or rivers. Water drawn from these secondary sources is often contaminated and there are outbreaks of water borne diseases. This is also the case in times of floods. Some even make a connection between the occurrence of these diseases and an increase in the spread of HIV as people visit traditional doctors for remedies for diarrhoea, dysentery or cholera and to administer the ointment the traditional healer makes small cuts in the patient's skin, with an unsanitised blade. The lack of reliable nearby water sources also means that communities are for the most part unable to practice any irrigated agriculture and winter cropping.

In years of low rainfall livestock lose weight, many die and theft increases as people get more desperate. People also reduce their livestock numbers by selling them to buy grain. Many children end up having to leave school in times of food insecurity as households can no longer afford to cover the costs (even in places with 'free' primary education such as Malawi).

Chapter 3: Supporting adaptation to climate change from local to regional: actors, relationships, policies, plans and activities

In order to support climate adaptation as a process of consciously shifting relationships within the socio-ecological system it is necessary to characterise the individual and organisational actors within this system. The political context (the actors, the process of making decisions and the plans) will play a large role in determining the nature, extant and speed of progress on addressing climate change issues. Good governance is key to enabling and stimulating climate change adaptation.

Regional activities

Although regional initiatives on climate change have been slow to emerge in Africa compared to other regions worldwide, this is starting to change. There are a number of research programmes, funded by international donors such as DFID, GTZ, IDRC and others. There are also other initiatives focusing on integrating adaptation to climate change at the policy level. Under the Comprehensive Africa Agriculture Development Programme (CAADP), NEPAD (New Partnership for Africa's Development) along with institutions such as the AUC, COMESA and WWF have initiated an African working group on climate change (NEPAD, 2007). This working group is expected to help provide an African led "voice" in international negotiations and programmes that

support mitigation or adaptation the impacts of climate change. Although there have been discussions about the formation of this group it is unclear how they will operate.

The Tunis Declaration and Action Plan on International Solidarity against Climate Change in Africa and the Mediterranean region was established after a meeting in Tunis, Tunisia, on 18-20 November 2007, attended by governments, multi/bilateral organizations, corporate, NGOs and academics. The Declaration highlights the gravity of the climate change problem and the urgent need to establish adaptation mechanisms and develop attenuation and clean development techniques in Africa. It also recognises Africa's growth and development priorities and limited capacity of adaptation. Parties agree to therefore include adaptation in development strategies and integrate adaptation measures into activities at all levels and across sectors, including developing awareness, capacity and sharing information; and in so doing request support from the international community in terms of financing, research and guidelines.

The Southern African Development Community (SADC) has recently identified Climate Change as a strategic imperative (at a SADC conference held in Mauritius, 19th and 20th April 2008) and there are a number of initiatives underway. A meeting held between OneWorld, DFID and SADC on the 29th May 2008 revealed that SADC are currently considering where to 'house' climate change within the organisation. This will probably be as a working group comprising representatives from the different secretariats. They are also interested in developing a policy on climate change for the region, through a consultative process with member states. Furthermore, the organisation has recently commenced the process for developing a SADC-wide environmental protocol, with climate change as a key consideration. The Water Secretariat hosted their annual SADC Water Multi-Stakeholder Water Dialogue in Lesotho, with the theme "*Watering development in SADC: Rising above the climate change threat towards security*". The water sector has been identified as the key sector for adaptation and the energy sector for mitigation. In this regard, it was therefore important that all sectors using and influencing water resources in the SADC region gathered at the 2008 Dialogue, to understand what adaptation entails, and how stakeholders can collectively respond to the climate change threats. Effectively, this means that the water secretariat has made a decision to promote sharing of IWRM strategies, experiences and best practices in climate change adaptation that address local, national and regional socio-economic development and poverty reduction (and attainment of the MDGs).

SADC have also recognised the need for a regional 'voice' on climate change, meaning that the region should be better represented in international climate negotiations, particularly fora that deal with issues such as the emerging adaptation funds. The objective is that SADC represent the region in these fora and that with improved climate analysis for the region, the member states and trans-boundary agencies such as water management agencies will be better positioned to access funding. They should also be in a position to inform the development of the international funding mechanisms, given the particular (and recognised) vulnerability of the region. It is envisaged that the Regional Climate Change Programme funded by DFID will support SADC in this process (through the provision of useful information as well as capacity building).

One of the most significant future commitments is the World Bank Climate Investment Funds (CIF) which was approved on 1 July 2008. This consists of two international investment instruments, designed to scale-up funding to address climate change issues. The Clean Technology Fund aims to help developing countries in their efforts to mitigate rises in greenhouse gas (GHG) emissions. The Strategic Climate Fund, will be broader and more flexible in scope and will serve as an overarching fund for various programmes to test innovative approaches to climate change. The total investments, based on preliminary indications from donor countries, are expected to be around US$5 billion over the next 3 years. Part of the aim of the Strategic Climate Fund is to move adaptation from being a standalone issue to being one which is fully integrated with core development planning and budgeting. There is some uncertainty as to how the proposed governance structures may inhibit maximum benefit of this fund at the local level (Muller & Winkler, 2008). The African Development Bank have developed a Climate Change Strategy that adopts a similar approach to the World Bank in that it aims to 'climate proof' its infrastructure investments in Africa.

It is expected these more regional activities will arise as increased funding comes on line. How projects and programmes link into the policies emerging, as mentioned above, is not clear.

Government actors

In Malawi, there is a strong message coming from the NGO community that government needs to take a strong lead on addressing climate change and provide a coherent cross-sectoral plan that can form the basis for collaboration and ensure that activities are complementary with widespread coverage. Government activities have thus far been exclusively driven by adherence to the UNFCCC (United Nations Framework Convention on Climate Change) reporting requirements, specifically in the form of National Adaptation Plans of Action (NAPA) and National Communications. Many have criticised the government for not being proactive. For example, the NAPA process was completed in 2006 and the document submitted, but since then little has happened to implement the identified priorities, until February of this year when the NAPA was launched along with the Human Development Report by the President. This slow progress on NAPA project implementation is a common experience in most of the Least Developed Countries (LDCs), associated both with protracted bureaucracy and politics within the country and that in the international system.

The NAPA process in Mozambique prioritised the following responses to climate variability and change: Early Warning Systems and local knowledge; strengthening agricultural resilience to climate change; reducing risk in costal areas; and improving water management. They have obtained funding for the component of early warning systems (EWS) from the UNFCCC. The Zambian NAPA has received considerable attention in the Fifth National Development Plan (FNDP) and the government has pledged to undertake efforts to ensure that the livelihoods of the most vulnerable households are secured against the adverse effects of climate change, protect vulnerable

groups from the worst impacts of risks as a result of climate change and create public awareness of the adverse effects of climate change.

The government of Malawi has recently formed a government and donor working group on climate change that is working on developing a national plan for adaptation, building on the NAPA, seemingly in response to, or at least being heavily pushed by, the donor community. The donor community is lining up to fund initiatives to address climate change, but they are struggling with challenges of coordination between different ministries and departments and mobilising funds in the short term to build capacity. The government is planning a number of activities including doing an inventory of all climate change-related activities currently being undertaken and an institutional analysis to assess gaps in capacity as well as opportunities. There has been an interesting shift in leadership on the climate change front in Malawi, where previously all government responsibility for coordinating and supporting climate change mitigation and adaptation activities lay with the Department of Environmental Affairs, but now some of this responsibility has been shifted to the Ministry of Economic Planning and Development (which co-chairs the government-donor working group on climate change with UNDP). There is even talk of shifting this further up to the Office of the President and the Cabinet. Attempts are being made to factor climate change considerations into the Malawi Growth and Development Strategy to ensure that investments are climate resilient (which is the language coming strongly from the development banks i.e. World Bank and African Development Bank). However, mainstreaming remains limited, as shown in the recent experience of drafting Malawi's new Social Protection policy, in which climate change is not at all mentioned, despite clear relevance to the issue.

The Department of Disaster Management Affairs (DMA) is also represented in the working group on climate change. Links to disaster risk reduction activities are starting to be made, but DRR work is still in its infancy in Malawi. This department has until recently been mandated simply with disaster relief. Now there has been a shift in focus to tackling preparedness and risk reduction but convincing the Ministry of Finance to invest in these activities is a challenge and there is a need for training at all levels. There is as of yet no DRR policy in place, but a process of formulating this policy is in the early stages, which will in turn inform a revision of the National Disaster Preparedness and Relief Act, passed in 1991 in response to a particularly damaging disaster event.

The situation in Zambia is similar to that of Malawi, where NGOs say government is not putting enough effort on educating on and facilitating disaster risk reduction and climate adaptation. A representative from Women for Change noted that government, through the Disaster Management and Mitigation Unit (DMMU), was mostly focusing on disaster response and doing less to respond to climate change. The government recently adopted the NAPA which will complement the efforts of the government through the following: (1) contributing to the security of vulnerable Zambians; (2) ensuring that the livelihoods of the most vulnerable households are secured against the

adverse effects of climate change and that their basic needs are assured; (3) vulnerable groups are protected from the worst impacts of risks and shocks as a result of climate change; and (4) creating public awareness of the adverse effects of climate change. The operational structures involved in the implementation of the plan are the satellite disaster management committee's district disaster management committees and the provincial disaster management committees. The DMMU has also developed a database about NGO's operating in Zambia to systematically store and update information including climate change-related programmes.

In Mozambique there is a *Master Plan for Prevention and Mitigation of National Disasters* that has been implemented by the National Institute for Disaster Management (INGC). This comprises a 10-year work programme that builds on the NAPA to address strategic priorities for reducing the risk and impact of natural disasters, with a strategic focus on: water; food and nutrition; and emergency response. The implementation strategy outlines the institutional arrangements including means to integrate civil society and enhance community participation. Within this framework, the Contingency Plan is published annually, containing three scenarios based on the seasonal forecast (low rains, average rains, and heavy rains), developed by the National Meteorology Institute. These scenarios estimate the necessary financial and institution arrangements, particularly in the critical months between October and April, as coordinated by the Technical Council for Disaster Management (CTGC).

Mozambique's Master and Contingency plans lay out a good framework and provide a national platform for response. However, for the benefits to be realised, implementation is needed (on executing plans and building capacity in ministries and local and provincial governments) rather than developing more policies and papers. The master plan currently focuses on disasters rather than integrating concepts of longer term change, so it does need to be strengthened by developing the understanding of climate change adaptation and increasing participation and ownership from more ministries. However, this should not take priority over implementation but rather be done in tandem with it. This is something that Oxfam can support and advocate for.

On disaster prevention and building resilience which links closely to adaptation, the INGC has concentrated their work on promoting the use of drought-resistant crops, flood-resistant housing, rainwater harvesting, and non-traditional income generating activities (such as production and sale of poultry, wild fruits and fruit juices). This work is also being mainstreamed into poverty reduction and economic development plans. The second *Action Plan for the Reduction of Absolute Poverty 2006-10* (PARPA II) includes the concept of disaster risk reduction as a crosscutting issue, spanning the themes of: macroeconomic stability and poverty; governance; economic development; and human capital. Unfortunately, while there is a theoretical recognition of disaster risk reduction as a crosscutting issue, the PARPA does not appropriately address the direct implications of disasters to all of the main themes but rather gives disaster risk reduction a more programmatic focus. The current legislation and working documents in

Mozambique provide the necessary framework for addressing the short- and medium-term impacts of increasing disasters associated with climate change. Much of this mobilization has occurred since the devastating floods in 2001, but implementation and mainstreaming of long-term disaster risk reduction with a vision to enhancing Mozambique's adaptive capacity and resilience still needs to be developed.

Provincial governments in Mozambique, with the support of INGC, Red Cross, and MICOA, have undertaken efforts to educate local communities on the importance of improving the construction standards in which areas affected by floods and cyclones are built or rebuilt and on using engineering and construction techniques that makes infrastructure more resilient to natural disasters, such as the construction of houses on pillars and the use of stronger materials. These activities were carried out in the disaster recovery phase after natural disasters occurred and are mostly disseminated by INGC personnel at the provincial level and personnel from the provincial government. Several organizations are conducting research on the application of drought-resistant seeds for agriculture. The Ministry of Agriculture has concentrated its efforts on areas of high agricultural productivity, while the INGC has been working in arid and semi-arid areas to promote the use of alternative crops, while also promoting income-generating activities through conservation agriculture and others. Many more activities for improving agriculture are underway, and they could benefit from better coordination and a unified agenda by the Ministry of Agriculture for DRR and long term adaptation.

Coastal management and land use, current policies and strategic documents in Mozambique make specific reference to the increase of more extreme weather and climate change on coastal areas. Although there has been consideration of better methods for land use planning in coastal areas, the existing population and land use changes make retrofitting quite a challenge. In addition, mitigation infrastructure, such as dikes and small recharge dams, could be restored or built in strategic areas as suggested in Mozambique's NAPA.

International agencies

The donor community and the United Nations agencies play a very influential role in determining the national priorities and the mechanisms for their implementation. With the issue of climate change now high on the international agenda there is enormous pressure on southern governments to tackle climate change, largely within the conditions set by external bodies, especially those with funding that needs to be channelled into these activities. With the challenge of weak institutional capacity faced by most southern African countries, the relationship between national and international institutions is often an uncomfortable one. In Malawi, a government donor working group on climate change has been established in efforts to coordinate activities by jointly setting priorities and developing a framework to guide funding decisions, however frustrations run high as this is a challenging process for all involved and progress is slow. A series of meetings are currently underway within government and between

government and a number of donors, development banks and UN agencies to put together programme proposals building on the NAPA priorities, led largely by UNDP but with a focus on government ownership. The climate-related work builds on the Poverty and Environment Programme led by UNEP.

The Zambian government has had funding from UNDP and other foreign governments including UK's DfID to help close research gaps on physical, social and economic impacts related to climate change. The Norwegian Government has also been involved in allocation of grants to support Zambia's efforts and resources in mitigating the negative impact of drought.

Mozambique is one of the *One UN* pilot countries, and they are collaborating to initiate a series of pilot Joint Programme strategies to enhance the ability of government institutions and various civil society organizations to tackle issues relating to disaster risk reduction and climate adaptation through the work of all UN-related organizations working with relevant Ministries. UNDP is the focal agency for disaster risk reduction and its goal is to establish and implement strategies for incorporating disaster risk reduction as a central concern of development policy and programming as well as of humanitarian/post-disaster recovery work, and for promoting and supporting a risk reduction agenda amongst development partners (UNDP, 2007). UNDP also serves as a focal agency for adaptation to climate change. The program aims to support the government of Mozambique's efforts towards sustainable development through strengthening institutions responsible for the promotion of pro-poor, equitable and sustainable economic development (UNDP, 2008).

Non-government organisations

There is a large NGO presence in these countries, including both international NGOs with country programmes and national NGOs. They play an important role in lobbying government and international agencies to take appropriate action and hold them accountable to this, while also doing work at the grass roots level to target support at those who fall through official safety nets.

For the most part the international NGOs work in partnership with local NGOs that do the implementation of specific projects. Almost all were set up as aid / development / relief organisations with the aim of combating poverty, but a number of them are now starting to include climate issues into their work. For the most part this does not seem to be donor driven but more in response to a recognition that poverty reduction strategies seem not to be working very effectively as people remain in desperate conditions and repeatedly suffer significant loses as a result of disaster events (unlike the cause for the same shift in government activities, which tends to be driven by more top-down processes).

Incorporating disaster risk reduction ideas into their activities has been a point of entry into the climate issues for many of these organisations, as dynamics around disaster risks are currently better understood than those involving slow onset, cascading, insidious risks associated with climate change, for which the science is still poorly developed and the uncertainties associated with them are high. Many NGOs are involved in advocacy work at the national and international level, lobbying governments to take the lead in addressing climate change issues and supporting them to take a certain strong stance on pertinent issues (for example by way of preparing position papers for use in the international climate negotiations under the UNFCCC).

NGOs in Malawi, including Oxfam, ActionAid, Red Cross, Centre for Environment Policy and Advocacy (CEPA), Evangelical Association of Malawi, Coordinating Unit for the Rehabilitation of the Environment (CURE) and River of Life to name but a few, are currently undertaking a range of activities that are a form of adaptation (to climate variability at least and in some cases to observed change[2]) that include:

⇒ programmes to support agriculture-based livelihoods and food security (e.g. promoting drought resistant crops, fertilizer, winter cropping and irrigation technologies)
⇒ awareness raising, information sharing and training on climate change issues with communities, local government, CBOs and traditional authorities (e.g. forming community policy dialogue groups, producing community videos, holding workshops for journalists, using drama groups and preaching in churches as means of spreading information on climate change)
⇒ reforestation (e.g. to protect from strong winds, provide flood control, reduce soil erosion)
⇒ catchment management (e.g. dredging river channels, stabilizing and rehabilitating river banks)
⇒ developing social protection measures (e.g. government grants for vulnerable sectors of society in the form of pensions, disability and child grants)

However, many practitioners note that local programmatic work is not enough to eradicate the root causes of poverty and vulnerability, and that this work has to be linked to global campaigns to change international political and economic practices and power dynamics if there we are to achieve a fundamentally change in the system that leads to greater equity.

There is already some NGO coordination within Malawi, for example ActionAid together with CEPA have been influential in establishing the recently formed Civil Society Climate Change Network and CURE have brought a network of NGOs working on environment issues together with government and the members of the private sector, with climate change as one of the important agenda items to discuss and commit to various relevant adaptation and mitigation activities. NGOs are represented in some of

2 as opposed to expected change as projected within the field of climate science

the government forums on climate change, but there is a clear message emerging from NGOs that they want to see stronger leadership and guidance from government in the form of a national adaptation strategy and plan of action that they can then feed their activities into to create a coherent response on climate adaptation. At the same time, NGOs recognise the need to maintain some autonomy from government to be able to fulfil their advocacy role, provide a platform for the voices of the poor to be heard by government, and not have their activities caught up in bureaucratic process.

NGOs have limited coverage, only serving pockets of the population in certain districts. Most NGOs in Malawi are still just piloting projects related directly to climate change issues (and justified on those grounds) to gather information and raise awareness. Many, including Oxfam country staff, feel there is a need for a clear message on what climate change science and international politics really means in their local context, enabling a better understanding of the cause-and-effect relationships that in turn justify a shift in approach, focus and programming. In Malawi at least, ActionAid seems to be leading the field of international NGOs in addressing climate change within their programme activities, and this provides a very important opportunity for shared learning and collaboration.

In Mozambique there are a number of NGOs that have included disaster risk reduction in strategic plans. These NGOs include CARE, Save the Children, Red Cross and Oxfam. Oxfam, for example, considers disaster risk reduction as a crucial element to mainstream in their work, in a similar way that HIV/AIDS issues are as mainstreamed into their programming. Although, there are no specific programmes on DRR and disaster response, but rather an overall integration into their existing programmes. Similarly, there are no projects specifically formulated as "adaptation to climate change," but rather many of the ongoing programmes, such as CARE's programmes in Nampula on conservation farming and natural resource management (CARE, 2008), that are likely to enhance the adaptive capacity of people in Mozambique. Some organisations still maintain a focus on disaster response, such as the Red Cross. Despite trying to shift their focus to include DRR they are struggling to secure funding to do this.

In Zambia, many local NGOs have been making an effort to integrate climate-related issues into their work. The Red Cross, CARE, World Vision, PELUM and PANOS are among the institutions trying to incorporate climate change into their programming activities. There is a move to partner with organizations to bring together different experiences on climate change and develop a common basis for moving forward. The Zambia Red Cross society has taken note of climate change challenges which fall under disaster risk management within the movement. Some adaptation projects include promotion of drought resistant crops and enhancing cropping mechanisms such as irrigation. Another project is livestock restocking as most communities resort to selling livestock during hard times, such as drought, to sustain their livelihoods. The society is helping communities restock chickens and training them on ways to prevent diseases. The Ministry of Agriculture is helping in the training of simple disease control activities

and vaccination programs. Participatory Ecological Land Use Management (PELUM) is an institution that works on natural resource management of sustainable agriculture. It is helping communities adapt to drought by supporting the implementation of small scale irrigation systems that tap ground water and a deepening of wells. It is also encouraging diversification of farming systems e.g. fish farming where concentrated water in a dam acts as backup for crops and in case crops fail, farmers can have other forms of income from fish sale. Training on post harvest methods and processing (like drying of crops) is also being done so that farmers have something to rely on in times of drought. Most farmers have also resorted to bi-annual planting regimes so that if crops fail after the first planting dates due to poor rains they can then replant again later in the year.

Community based organisations, communities and individuals

At the local level people are well aware of the challenges they face in terms of poverty, disaster risk and environmental change and people speak of observable trends in how they have experienced a change in climate, as discussed in chapter 2. Groups, communities and individuals are undertaking various strategies to cope with these realities. In Malawi this includes:

⇒ planting trees (to conserve watersheds and to protect houses from strong winds)
⇒ growing hybrid maize and cassava varieties that mature more quickly than local varieties (but only few can afford these)
⇒ planting more drought resistant crops like cassava, sweet potatoes and soya
⇒ planting crops earlier or later, depending on shift in rainfall patterns in the local area
⇒ not lighting bush fires
⇒ constructing contour ridges to conserve soil and water
⇒ boiling drinking water to avoid water-borne diseases in times of drought and floods
⇒ adopting new planting technologies (e.g. single seeds only 25cm apart)
⇒ engaging in small businesses (e.g. selling fritters, charcoal, fish, traditional beer)
⇒ doing casual work, called *ganyo* (e.g. within the village they might mould bricks or work on someone's plot and in town, such as Lilongwe, they might work in construction)
⇒ some resort to crime and sex-for-food transactions

It is difficult to determine to what extent these activities are needed due to anthropogenic climate change, over and above natural climate variability and other environmental and socio-economic stressors. Very few people refer to these activities as climate adaptation strategies although they articulate the connections between these activities and various forms of environmental change very clearly, which is equally important in supporting community-based adaptation. Other than in the few places were NGOs and/or government agencies are supporting and piloting specifically designed climate change projects, most of these adaptation activities are being

undertaken in response to changes that have been experienced and not in response to warnings and guidance that have been issued.

In Mozambique, there are over a 100 community-based groups throughout the country that support the disaster response activities, from dissemination from EWS to search and rescue, working closely with INGC, Red Cross, and the provincial governments. The role of these DRR groups could be further enhanced; they currently have a role that is limited to EWS, but they could become the key actors for the implementation of the national DRR plan. Recognizing the importance of the involvement of local leaders is crucial; these groups could be supported by local NGOs, and are a model that deserves attention for funding and programming by the different international development groups. Some stakeholders noted that the involvement and role of the DRR community groups is often jeopardized by the lack of interest in view of more pressing community needs, such as issues related to health and economic development. Enhancing the work of the DRR will require linking long-term adaptation and DRR with programmes and projects that deal with the needs of today in order to engage communities in long term adaptive action.

Academic institutions

There are a number of research projects being done in all 3 countries on climate change adaptation. These are often difficult to track as many are being undertaken by foreign institutions, although usually in collaboration with local academics, and many have a regional as opposed to national focus. Many are being funded by European and North American donors, including notably the European Commission, DfID, the Rockefeller Foundation, etc.

For example, staff from the University of Malawi was involved in coordinating a consultation process on climate change in southern Africa and how stakeholders were addressing these challenges, as an input for the G8 meeting last year. Also, they have done a study recently to investigate the dynamics of migration as a coping and adaptation strategy, working with communities in the Lower Shire area affected by flooding. A project in Zambia by Panos Institute of Southern Africa (PSAf) is currently implementing an environmental programme which includes dissemination of information via radio that will educate small scale farmers on climate change and ways to adapt there farming methods. Among methods being promoted for adaptation strategies include the rearing of small animals like goats, growing of drought torrent crops, fish farming and encouraging exchange visits for farmers.

Another example, from Mozambique, is the 'Long Term Vulnerability to Climate Change', which is an ongoing initiative to study the vulnerability of Mozambique at different levels under different scenarios is being funded by UNDP, UK, USA and Denmark. The project is coordinated by MICOA and INGC, and should yield long-term

models downscaled to specific regions. The project's finals outcomes will be presented next year, with a consultation workshop in November 2008 (Van Logchem, 2008).

Lots more work needs to be done on how organisations can access and use pertinent climate information to make programming decisions on an iterative basis. This in part will need to involve finding innovative means of working with academic institutions, to contribute in shaping the research agenda and harnessing research findings.

Stakeholder coordination

Coordination is a word that comes up frequently when talking with all kinds of stakeholders about activities to address climate change, and always in the context of being much needed but exceptionally difficult. This is a particular challenge within government, between different ministries and departments, as it is between UN agencies and donors. Various initiatives are underway to try and address these institutional challenges, including the formation of working groups, task forces and networks, undertaking inventories and institutional analyses, etc.

In Malawi a government and donor working group on climate change has recently been established, to collectively develop a set of priority activities, develop Joint Programme plans and streamline funding. There is also a more technical task force in place, which is composed of government institutions, international agencies and NGO representatives, and is to undertake an inventory of current climate-related activities and an institutional analysis to identify gaps in capacity as well as existing opportunities. There is also a National Disaster Committee, mainly composed of government actors but also with a few NGOs, but the aim is to set up a National Platform for DRR that will include government, NGOs, private companies and academic institutions. However, how these various mechanisms for coordinating climate related activities and DRR activities will be linked, or feed into each other, is yet to be established.

In Mozambique a donor working group has been formed. Following the initiation of the UN DRR joint programme, a donor working group, integrating disaster risk reduction and recovery, was formed. The working group aims "to establish and implement strategies for incorporating DRR as a central concern of development policy and programming as well as of humanitarian/post-disaster recovery work, and for promoting and supporting a risk reduction agenda amongst development partners" through a policy dialogue, coordinated DRR activities, research, information sharing, and the promotion of standards and guidelines (Disaster Risk Reduction and Recovery Donors Working Group, 2008). In Zambia an Environment and Natural Resources National Steering Committee (ENRNSC) was established in 2006 to provide strategic guidance on projects from MTENR including the NAPA.

Chapter 4: Key challenges and opportunities

Adaptation to climate change is a complex issue because it is linked to the complexities in the climate science as well as the complexities in society. In addition to climate change there are many other stressors that people and systems face, yet the rate of climate change is a threatening stressor, that is already impacting society and likely to exacerbate other stressors. It is important to contextualise a response to climate change within the existing socio-political context. This section suggests a number of areas which are likely to present both challenges and opportunities for engaging with adaptation to climate change.

Institutional challenges and opportunities

Developing a coordinated response

A lot of new initiatives and funding opportunities are emerging at the regional and international level. It is critical that coherent strategies are developed at the national and regional level that factor in strengths and disparities across southern Africa.

Although funding opportunities are increasing, there is currently not coherence and coordination in addressing adaptation issues at the regional level across southern Africa. This is not surprising as this is a relatively new field. However, it is important that this is addressed so that duplication is avoided and urgent needs are addressed holistically rather than in an ad-hoc manner.

There is poor coordination within and between civil society, NGOs and government. Leadership from within governments would be desirable, particularly between ministries and departments and between government and other stakeholders. In all countries in southern Africa governments need to take a stronger lead and provide a coherent cross-sectoral plan for others to follow. In advocating better coordination from within government it should be recognised that many governments are being pushed into action by donors. They do not necessarily take ownership of the problem or the capacity to respond, which suggests that they shouldn't necessarily be seen as enemies, but should be engaged with to develop future plans.

Leadership is also needed from the NGO sector that tends to have more flexibility in developing rapid responses to emerging challenges. In Malawi for example, some NGOs are piloting a project to gather information and raise awareness of the issues on the ground. At the national level, there is little NGO coordination for national campaigns on climate change although there are some efforts by various coalitions.

Countries need to develop their own strategies that provide direction on how to integrate adaptation to climate change with other development priorities. One opportunity would be for countries to develop their own national adaptation plans. Many countries have produced NAPAs that focus on adaptation strategies so it is important that the national strategies, plans and policy link to these. National strategies

should not be driven by this process which has been externally funded and coordinated by a central international fund. One of the objectives of national adaptation plans could be to identify the different roles needed and who might play them. For example, in consultation with the Meteorological Services government could decide whether or not they had the capacity to provide climate change scenarios or if external support is needed. Similarly, the Department linked to Disaster Management could outline their role in disseminating early warning information about extreme events.

Sector specific plans need to be considered in terms of the existing and potential links to adaptation. Some countries might choose not to have a national adaptation plan but rather mainstream adaptation issues within different ministries. Others might have a national plan that links to different ministries where appropriate. For example, in Mozambique, the Department of Disaster Management Affairs aims to set up a national platform for disaster risk reduction that will include government, NGOs, private sectors and academic institutions as well as consultations with civil society. This could serve as the main national link in to adaptation. In other countries, this might not be appropriate. An NGO like Oxfam GB might be well-positioned to support a process of revision and formulation of existing and new policies. They could also help look for opportunities for coordination between government and NGOs to shape the agenda to ensure a climate-sensitive response.

Improving coordination at the local level is also important and can be linked to community-based adaptation. This concept is being explored by many stakeholders, but there has not been a national agency or NGO that has championed it. Based on the experience of the disaster risk reduction community-based groups, there is important potential for supporting community-based activities for adaptation with multiple benefits, such as poverty reduction and risk management. Thus, the role of community-based groups deserves further research, particularly to explore the potential of the groups to implement a long-term adaptation vision and to enhance the collaboration between groups based in the capital with communities in the rural areas.

Links to disaster risk reduction

Given that climate change is expected to increase the frequency and intensity of disaster such as flood, droughts and cyclones, reducing the risk of disasters is a critical component of adapting to climate change. In many countries such as Malawi and Zambia, disaster risk reduction is still a relatively new concept so there is no existing policy related to it. In the case of Malawi there is just an outdated Act relating to disasters. In Mozambique, on the other hand, the concept of disaster risk reduction is widely used. Widespread use of the concept provides an opportunity to illustrate one type of adaptation that is already occurring. However, it is important that disaster risk reduction strategies are not relied on as the only response to climate change. Although the impact of disasters is expected to increase, there are also more gradual climate trends that need to be addressed. These more gradual changes, such as change in annual

rainfall amounts for example, require adaptation to focus on a range of adaptations and not just disaster risk reduction.

Understanding of climate change

Climate change is often portrayed as a new problem, rather than it being explained as incorporating both observed changes in recent years as well as expected future change. It is critical that more effort is taken to ensure effective and accessible dissemination of the scientific messages as well as the opportunities for responding. If stakeholders do not understand the problem, it is hard for them to know how to develop a response strategy. Tackling adaptation to climate change requires increased information and awareness about the challenge and a clear message on what the response could entail.

Opportunities linked to improving understanding of climate change include incorporating related issues in the primary school curriculum so that children are aware of it. They also form a conduit for passing information to their parents. Other types of information and awareness need to be targeted at the community scale and to public and private sector stakeholders. In additional sector specific messages need to be developed.

There are many ways that information can be disseminated. Public awareness could be increased by addressing climate change issues in newspapers and on the radio in the local language. More creative methods might involve story-telling, dramas, participatory and community video and art competitions as some examples.

Workshops, conferences and meetings are one way to build capacity and awareness about climate change issues. In many countries the number of climate change gatherings is growing rapidly. These focus on different issues around climate change impacts and response and are targeted at different scales. For example, some workshops might encourage farmers to look at climate change impacts on agriculture and how they currently cope with climate shocks and stressors. Other might ask national stakeholders about their policy response to climate change issues. It is important that there is coordination between those holding gathering so that there is not climate change fatigue and that these workshops address the needs of local stakeholders rather than just the interests of donors.

Links to other development interventions

It is important to state how existing interventions that might address social protection and livelihood opportunities link to climate change. For Oxfam this could include articulation of how their work on food security and income generation link to climate adaptation considerations. It would also provide an opportunity to feed into Oxfam's global campaign on climate change and how local livelihood initiatives might link to adaptation. Local programmatic work is not enough to solve the climate change problem. There has to be a link from the ground to global campaigns and from global campaigns to local realities to drive effective change.

Aim of response
In terms of linking country programmes to regional initiatives, Oxfam must remain clear on who it is they are trying to influence at what level (e.g. SADC, national government, other NGOs etc). Once this is established, effective methods can be used for achieving the stated objectives in order to encourage and enable change. For example, ActionAid has taken a focused look at what Malawi's involvement in the UNFCCC means practically for local communities. They plan to build capacity of local communities to understand the climate justice debate so as to build a campaign for COP15 where countries will make binding agreements. It is these targeted responses that are likely to be more effective.

Technical challenges and opportunities

Improving quality and access to climate science
Ensuring high quality climate science remains a challenge in Africa (Ziervogel et al, 2008). Meteorological Services face many challenges including limited budgets, limited data and a lack of skilled people for interpreting data and communicating information. International support for these organisations seems to be phasing out (such as the World Bank climate risk insurance project) and governments have to take over when already stretched. Many of the opportunities for funding from international donors have stringent strings attached to funds and little room for manoeuvring or revising budgets to address local priorities.

The current international focus on climate change could be used as an opportunity for Meteorological Services to increase their resources and capacity. The increased attention on climate risk opens up opportunities for monitoring and improving the climate science because it is now understood that climate affects many sectors directly and indirectly.

Science communication
The need for improved understanding about climate change was mentioned as an institutional challenge. It is also a technical challenge, as specialists who understand risk and science communication are needed to ensure that clear messages are communicated. In southern Africa, there is a lack of organisations and individuals who have the skills to do this. A two-pronged approach is needed that 1) builds capacity in individuals and organisations in supporting risk communication and 2) develops appropriate risk communication material. By ensuring material is available that addresses the risk of climate change and how it affects different sectors it becomes easier to communicate what the impacts might be on different sectors. As important as material are people who can communicate the messages and engage with stakeholders on the topic. This will help to ensure effective mainstreaming into other activities.

Developing adaptation options and implementing responses

Identifying key vulnerabilities is an important starting point in developing adaptation responses. Technical capacity is needed in order to identify which communities are most vulnerable to which climate stressors. For example, those most affected by climate-related disasters might be located in an area physically isolated due to bad road networks. Some of the vulnerability linked to physical characteristics could be easily mapped. Work undertaken by the Regional Vulnerability Assessment Committee (RVAC) would be a good starting point. They are a multi-agency committee that was established in 1999 to undertake local Vulnerability Assessment Mapping exercises across SADC. They have focused on food security and vulnerability analysis at regional and country level.

Once key vulnerabilities are identified it is important to explore appropriate adaptation strategies. Although some might appear appropriate from a technical perspective, it is important that they are also assessed in terms of their socio-cultural applicability and sustainability. Often existing local actions can be used as a starting point from which to develop other strategies that might help deal with future climate change. In some cases existing strategies might not be appropriate and new ones will be needed but these should be developed in consultation with a range of local stakeholders. Types of responses might include improving early warning system, enhancing development of drought tolerant crops, training communities on post harvest methods and processing and improving access to markets, credit and insurance.

Narrowing the gap between those doing advocacy work and those involved in technical support is needed. Again, this can link back to strengthening the intermediaries who are able to translate both scientific and advocacy information into messages relevant at the local scale both from the technical and more general information perspective.

Organisations need to start reflecting on their programmes in light of climate variability and whether the success of implementation will be affected by climate change. To do this they need to interact with climate scientists and technical information more which is not always easy. In Malawi, IPRSE is involved in a number of projects addressing climate change and will be putting out information for these organisations to draw on in terms of what climate change might be expected for Malawi. It is also important that organisations work more with academic institutions to draw on their research (e.g. in Malawi, Bunda College has a Master Programme in Environmental Science).

Socio-political challenges and opportunities

Even if climate variability impacts on the environment first, it is the social landscape that is likely to determine the degree of impact on livelihoods. This demands a thorough understanding of the local context that addresses gender, culture, politics and governance before developing adaptation responses.

This point can be illustrated with reference to Malawi. Communities around Lake Chilwa rely on fishing and rice cultivation as their main livelihood activities. The lake is a fragile systems; it is shallow with a maximum depth of six metres. The lake dried up completely in 1995 and about 6000 fishermen were out of a job. Many of them moved up to Lake Malawi which generated some local conflict. There is a concern that climate change could lead to more migration and potentially more conflict. This example illustrates that the impacts of climate change and the potential responses need to consider the broader context. The type of support for adaptation would take different forms depending on how the initial situation was assessed and if the problem is looked at holistically.

An example of acknowledging culture can also help in communicating messages. In Malawi, there is a local myth that large snakes conserve water and that deforestation has meant that there are now fewer snakes in the area which is why there is now less water. Although the scientific links might not be clear, cultural beliefs such as this could be used to engage communities on these issues.

Adaptation to climate change could provide an opportunity to build on social networks and community-based risk sharing strategies. In some villages every member of the community might be expected to work on the communal plot where the produce is used for community events such as weddings and funerals and the proceeds are used to help the poor and vulnerable. The produce might be stored at the house of a person that is trusted by the community (not necessarily the headman's house) and this person might negotiate the sales. This type of risk sharing could buffer climate-related shocks where individuals' plots might get flooded and non-climate stresses, such as orphans trying to secure a food supply. If the social network characteristics are not considered it would be hard to replicate such activities. NGOs could adapt and enhance these types of activities where risk is shared that could act as a form of insurance.

In Mozambique it was clear that previous strategies that strengthened early warning and disaster response reduced the impact of the 2007 cyclone. Communities were aware of the challenge and worked with NGOs and government to develop appropriate responses. NGOs could play an even greater role in strengthening these links between communities, intermediaries and the government.

Gender issues

Recognising differential vulnerability is important when developing adaptation strategies. Investigating the differences between the vulnerability of men and women is an area that requires specific attention. This is particularly important in many southern African communities where women and men often undertake different reproductive activities. Women can be vulnerable to low rainfall and drought because during these times they often have to fetch water and firewood from further away.

In times of low crop yields and food insecurity, many people seek casual work and use the earnings to buy food and meet basic household needs. In the rural areas people might mould bricks or work on someone's plot and in town they might work in construction. Both men and women engage in these activities although certain activities may be gendered. For example men might search for wood to make charcoal. They may then have to travel far distances into town to sell it causing a shortage of labour in the fields resulting in women doing more of the work. There are also differential impacts depending on whether there are 2 adults or only a single adult in the household. If there are 2 adults that both find work then the household will collectively earn more money. However, some people in Malawi noted that in some cases it may be easier for the woman in a female headed household to go out and try to find work because she can just go, whereas a woman with a husband first has to look after the man and often ask his permission before she can go out and look for work.

There are also links between climate and agriculture, gender and health. When yields are low and there is income insecurity, crime and prostitution often increases. It was noted that some men run away from their responsibilities at this time and only come back when there is food in the house. Some women resort to prostitution to get food for the children and this leads to an increase in the spread of HIV. Some women are only likely to engage in sex for food transactions when the man is away. In one area close to Lilongwe with a high number of bars, a group of women suggested that in their area between 5 to 7 out of 10 households have woman that might resort to sex for food transactions in the critical months from December to January.

Despite the differences in vulnerability it is important to explicitly engage women in developing adaptation strategies as they have an important role to play in understanding the social dynamics. Particularly during disaster response they play an important role in the recovery process. For this reason, it is critical to incorporate gender specific activities at the community and provincial level.

Figure 7: Trade at urban markets can provide income for households.

Chapter 5: Informing Oxfam's response to climate change adaptation

Oxfam has a wide range of programmes and projects in countries across southern Africa that focus on supporting local communities and strengthening livelihoods. Currently, the country offices have not strategically focused on adapting to climate change, or worked much within a disaster risk reduction framework. There is as yet no clear strategy in place at the regional level to support country offices in responding to climate change, but efforts are underway to develop such strategy as a means of directing the inclusion of climate considerations into existing programming.

This study will contribute to Oxfam's regional climate change strategy development process, as will ongoing inputs from Oxfam GB headquarters, which is pushing forward on the climate change agenda. Oxfam International has developed a global strategy and operational plan on climate change (within the Economic Justice framework) that have been sent to regional and country offices. The Oxfam Southern Africa Regional Office is apparently the first one to develop a concept note based on this strategy that included undertaking this research study.

A number of Oxfam's existing interventions that strengthen social protection can be seen as contributing to adaptive capacity in a general sense but it is increasingly being realised that the choice of activities to support adaptation needs to be informed by robust climate information. This will help to ensure that activities supported by Oxfam do not result in "maladaptation" (that actually increase vulnerability to climate variability and change). An example might be projects that support an economy around lake aquaculture that later becomes unviable due to increased water temperatures or reduced water levels. Responding to climate change therefore requires an enhanced understanding of the long-term impacts of disasters and changes in weather patterns. While most stakeholders are aware of the problem, short-term action to build a long-term vision is still lacking.

As stated in a recent report by the World Economic Forum (2008, 15):

> *Many donors prioritize "technological fixes" or "stop-start" emergency aid. But promoting disaster reduction at the local level by supporting community-coping strategies is more effective and yields immediate benefits that stretch beyond tackling climate-driven disasters. Disaster response and management programmes can be strengthened to address growing weather variability and provide longer-term support of people's livelihoods to address the underlying causes of food insecurity. Climate change should be factored directly into development: "good adaptation" makes for "good development".*

Emerging from the case study evidence, recent literature and broader experience in addressing climate adaptation issues in southern Africa, there are a number of key recommendations for Oxfam GB to consider in developing their regional strategic plan for southern Africa.

Recommendations

1. **Improve science communication by developing a range of information products targeted at specific users (according to organisational objectives). These should outline the nature of climate change for specified regions, groups and sectors, the expected impacts and potential options for adaptation in simple ways. They could also include documentation of local impacts of climate variability and existing coping and adaptation measures. They should be presented in the local language through a range of media.**

Current dissemination of accessible and easily understandable climate change scenarios and key messages on the nature and possible responses to climate change is limited. This leaves stakeholders aware of the general problem of climate change but without knowledge on how it relates to their activities and the local context, and thereby not sure how to effectively contribute to addressing the challenges caused by climate change.

Improving communication requires training of appropriate people in how to effectively communicate messages that are often complex, to various stakeholders. Methods that include stimulating dialogue and mutual feedback over and above simple one-way information dissemination are needed. It is also necessary to support dissemination of this material in non-technical language as well as the local language and through a range of media that will reach different target audiences. Oxfam, and other NGOs that are involved at a local level but linked in to the national and regional level, are well placed to act as facilitators, connecting science communicators with local NGOs, CBOs and communities. They might also be well placed to help local communities in articulating their challenges related to climate impacts back to the national and international communities.

2. **Differential and dynamic vulnerabilities need to be assessed in order to prioritise and target adaptation responses. An assessment of vulnerability to climate change should be contextualised within other development challenges that are faced at the local level.**

It is critical that vulnerability to climate change is assessed at a scale that is relevant to the programme or project, rather than assuming everyone is equally vulnerable i.e. national vulnerability assessments may help to identify key areas to target, but effective responses will need to be based on a more nuanced understanding of intra-community and even intra-household vulnerabilities. This will help to prioritise where adaptation responses need to focus initially and also inform the nature of these responses, for example if they need to be gender, age or culture specific. In some areas it might be clear that the rains that used to start in a certain month now tend to start later. For example, in southern Zambia there appears to have been a delay in the onset of the rainfall season and lengthening of the dry spell. In these areas, households reliant on rain-fed agriculture might already be vulnerable. In other areas it might be women or children who are significantly vulnerable, because of social norms, and need to be supported in developing adaptation responses. Key to this is understanding the interaction between a number of biophysical, economic and socio-cultural stressors that people face.

Interventions need to consider these interactions as well as differences in response priorities of stakeholders.

Better vulnerability indicators could contribute to monitoring differential vulnerabilities and how these change over time, but they have to be iteratively revised to make sure that the indicators can capture possible new emerging vulnerabilities. In Mozambique for example, loss of life in the 2000 and 2008 floods served as benchmarks but it would be useful to have more nuanced indicators that enable post-disaster event responses to strengthen livelihoods where needed and address issues of social protection, risk management, economic losses, and risk transfer.

3. **Assess the robustness of current initiatives in light of expected climate change. This helps to focus on what climatic changes are of most concern to local communities in order to strengthen resilient characteristics and prioritise the type of adaptation needed.**

Oxfam has strong links with local partners that should be drawn on to reflect on what development and disaster risk reduction priorities exist and how these can be addressed in a way that will not be undermined by future climate change. In addition, they need to engage with their partners to understand what local strategies are currently creating resilience, as these locally based strategies provide a good starting point for future response. Importantly, the specific reasons why climate change is likely to impact current strategies should be outlined and shared with partners, with reference to the climate science.

It should be noted that the NAPA process proposes priority adaptation strategies at the national level. It is hard to assess the robustness of these priority strategies as on the whole money has not been allocated to implement these strategies. It is important for Oxfam to engage with the NAPA process, particularly in examining how the prioritized strategies address the needs of the most vulnerable at the local scale.

4. **Integrating climate adaptation into existing development and disaster risk reduction frameworks, priorities and plans will help people not to see climate change adaptation as a new task that is not their priority but rather enable responses to current concerns to be more robust with regards to longer-term climate change.**

It is important that people do not feel overwhelmed by the climate change problem as yet another stand-alone issue they have to add to there to-do list. As illustrated in this report there is much overlap with development and disaster risk reduction strategies and activities, and these must be identified and built on to strengthen existing capacities and ensure coordinated and consistent efforts. This also facilitates ownership of the process, embedding it in multiple organisations, institutions and communities building on existing strengths. For example, if certain disaster risk reduction strategies are already in place, such as improving construction techniques and standards, these are likely to strengthen resilience in light of an increased number of cyclone disasters. Building on these existing risk reduction strategies, for example by increasing the

standards slightly so that buildings are able to withstand disaster events of a higher magnitude, would then form part of an adaptation plan. It is important that a long-term perspective is adopted in order to understand how the risks being addressed are likely to change and thereby whether the current strategies are appropriate and sufficiently robust. Strategies that address a longer time scale, beyond just preparing for the next flood, are necessary to build long term resilience to climate change, and the international community and NGOs have an important role to play in promoting and supporting this.

5. **NGOs are well placed to help local communities voice their realities and challenges in a way that makes them heard by government and the international community.**

Oxfam could create a bottom-up framework that enables local issues to be explored and presented in creative ways that facilitates these issues being included in developing national priorities and plans without it turning into a top-down national plan. Continuing to pay attention to the provincial and local issues is a good level at which to balance context specific strategies with broader national vision.

At the village level people are aware of the impact climate has on their livelihoods and there are many stories about the changes in climate experienced over the past years. Many CBOs and NGOs are engaged in activities that support communities in strengthening their response to climate impacts. Yet, at the government level there is limited capacity to support a holistic response to climate change adaptation that provides a framework for coordinated action between different stakeholders and ensures national coverage. It is critical that NGOs help local communities and CBOs strengthen their engagement with government.

6. **Provide support for developing demand-driven locally relevant adaptation priorities and projects rather than allowing for the escalation of supply-driven responses where national organisations focus on the requirements laid out by funding opportunities and international pressure.**

It is important that countries not only focus on climate adaptation because increased international funding has become available. People at the local and national level are the ones who are most aware of the range of challenges they face and what the feasible and desirable adaptation strategies are that they might engage in that will fit with their own development objectives. It is critical that these people and nations are given a voice to articulate their desires and develop adaptation strategies designed to address local needs and realities. This process should not be rushed because of donor needs to offload large sums of money.

NGOs should work with ministries and departments to build capacity, ensuring that information about the impacts of climate variability and change are understood and locally appropriate responses are developed. This should include discussions on policy formulation, implementation and resourcing. This is particularly important at a time when international funding for climate adaptation is growing rapidly that will largely be

channelled through government agencies, where problems of poor coordination, limited human capacity and gaps in the policy framework slows progress dramatically.

Although leadership is needed at the national level, a word of caution should be included. Pushing a national agenda and plan should not mean that priorities are decided at the national level on behalf of the local, district and provincial stakeholders.

In Mozambique, a donor-working group has been set up to coordinate disaster risk reduction responses. This is a strong step to coordinating aid better, and to collectively responding to funding needs as long as a range of stakeholders at all scales are given a chance to have their say. In Malawi, a government-donor working group has been established to set priorities and coordinate how bilateral funding being made available for addressing climate change is used. There are however a number of institutional challenges associated with this and seemingly still a large power differential underlying the decision making processes of this group that keeps the donors in the driving seat. Both government and UN agencies expressed a need for more NGO representation in these sorts of processes and Oxfam could well play a role in this, alongside the likes of ActionAid and CURE. There is also a great need for local capacity to provide technical support for planning and implementing adaptation projects that come onstream as a result of this flood of donor money for climate change.

7. **Support advocacy to ensure that local beneficiaries are well equipped to access and manage adaptation funding rather than allowing only a small proportion of the money to reach the local level and get caught up in bureaucracy and management.**

As the international adaptation funding increases there will be a 'business' that develops around competing for access to these funds. Many of the communities most vulnerable to climate change are unlikely to be in a strong position to lobby for these funds due to political and social inequities. It is therefore crucial that steps are taken to ensure that support is provided to these communities to help them access funds and support for adapting to climate change. While this is starting to happen in an aggregate sense at the international level, these advocacy campaigns will need to be linked with local action at the national and sub-national scales to follow this through and ensure that international monies allocated to support adaptation in highly vulnerable communities, reach the intended beneficiaries in a way that supports endogenous development and makes them more resilient to changing climatic stressors in a sustainable way.

8. **Develop strategic partnerships for collaborative efforts and shared learning opportunities around climate risk and response. This requires improving communication and broader engagement with other civil society organisations. It contributes to narrowing the gap between those doing advocacy work and those offering technical support.**

There are a number of ways that Oxfam could enhance collaboration within the field of adaptation to climate change in southern Africa. In Mozambique it is clear that the success in disaster management over the past decade has been, among many other

reasons, thanks to collaboration between many different entities. In a similar vein, if long-term impacts of climate change are going to be linked to disaster risk reduction it cannot happen in isolation.

Improving communication is an important starting point. Information needs to be shared in the local language and scientific data needs to be translated into messages that are easily understood. Local NGOs could support communities in disseminating information if there is a good understanding of the material. Oxfam could definitely play a role in supporting this capacity building and act as an information hub. They should build on lessons that have already been learnt by other NGOs doing this, such as ActionAid in the case of Malawi. These international NGOs are also in a unique position to channel information on these local process and activities up to the international arena and between countries (South-North and South-South), where these messages need to be heard to feed into and inform international efforts and to share learning with communities in other regions trying to adapt to similar threats.

Broader engagement with civil society around issues of climate change adaptation is essential to facilitate bottom-up processes and complement top down projects and policies. Current volunteer networks could provide one way of engaging with civil society. For example, Red Cross volunteers could be further empowered to work with provincial and district governments for early risk identification as well as helping to encourage the development of local adaptation responses. The contribution of civil society groups in informing the national strategy and plan of action for addressing climate change is also critical, so that it builds on existing local responses and factors in priorities set at the household and community level. There could be several different mechanisms for this collaboration, such as increased participation of NGOs in donor meetings, government council meetings, and so on.

The way forward

This paper scoped out the work that Oxfam country offices are undertaking in relation to climate change adaptation and disaster risk reduction in Malawi, Mozambique and Zambia. On the whole, there is not a focus on these issues within the country offices. However, numerous other stakeholders were interviewed and their reflections helped to paint a picture of current national activities in this field. The recommendations that have been presented are intended to guide Oxfam GB in developing their strategy to engage in climate change adaptation and disaster risk reduction in the region. They have remained policy-relevant rather than policy-prescriptive as we felt it is necessary for Oxfam GB to decide how to implement these recommendations in consultation with the country offices and their partners.

This study had a limited scope. More research is needed to paint a more complete picture of how best to support an integrated approach to community-based adaptation to climate change and disaster risk reduction. In particular the areas that could be further researched include:

- ⇒ More focussed research on actors, policies and programmes at the regional and continental level. As mentioned in the report, many of the international players are positioning themselves on the various climate change issues, and regional bodies such as SADC and the AU are developing policies and programmes of action to respond to challenges for the region posed by climate change. Because these responses are all quite new and rapidly expanding, there is huge scope for further research on this as a stand alone study, particularly if one is interested in looking at how these regional decisions and activities play out in the national context.
- ⇒ Evaluation of how to support community-based activities for adaptation to ensure multiple benefits, such as poverty reduction and risk management. This should include the exploration of the potential of local groups to implement long-term adaptation visions through partnerships.
- ⇒ Investigation of causal linkages between vulnerability and climate change. Some specifics topics might include the relationship between deforestation and the sustainability of charcoal production as a coping or adaptation option.
- ⇒ Developing and testing methods, tools and material for communicating climate change to a range of different stakeholders. This should include issues ranging from raising awareness to being competent in selecting appropriate adaptation measures and designing climate-resilient projects and programmes.
- ⇒ Developing processes, collaborations and methods for linking indigenous knowledge and qualitative information about climate-related perceptions to quantitative climate data, critical in supporting livelihood adaptation.

Oxfam GB and their country offices in southern Africa are well placed to work with communities and other organisations to find innovative and sustainable ways of responding to the changing climate that is currently being experienced both globally and locally. While Oxfam continues to work on alleviating poverty and addressing inequality, it is now imperative that projects and programmes are assessed in light of climate change, making sure that activities, where appropriate, make people less vulnerable to climate risks. High levels of climate vulnerability and poverty in southern Africa make it a priority area for Oxfam GB to mainstream climate considerations into their development activities, campaign on climate justice issues and work with partners to enhance local and national adaptive capacity.

Glossary of terms

Adaptation: Adjustment in natural or *human systems* in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory, autonomous and planned adaptation:

> **Anticipatory adaptation –** Adaptation that takes place before impacts of *climate change* are observed.Also referred to as proactive adaptation.
>
> **Autonomous adaptation –** Adaptation that does not constitute a conscious response to climatic stimuli but is triggered by ecological changes in natural systems and by market or *welfare* changes in *human systems*. Also referred to as spontaneous adaptation.
>
> **Planned adaptation –** Adaptation that is the result of a deliberate policy decision, based on an awareness that conditions have changed or are about to change and that action is required to return to, maintain, or achieve a desired state.

Adaptive capacity (in relation to climate change impacts): The ability of a system to adjust to *climate change* (including *climate variability* and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences.

Climate: The long-term average weather of a region including typical weather patterns, the frequency and intensity of storms, cold spells, and heat waves. Climate is not the same as weather.

Climate Change: Refers to changes in long-term trends in the average climate, such as changes in average temperatures. In IPCC usage, climate change refers to any change in climate over time, whether due to natural variability or as a result of human activity. In UNFCC usage, climate change refers to a change in climate that is attributable directly or indirectly to human activity that alters atmospheric composition.

Climate model: A numerical representation of the *climate system* based on the physical, chemical, and biological properties of its components, their interactions and *feedback* processes, and accounting for all or some of its known properties.

Climate (change) scenario: A plausible and often simplified representation of the future *climate*, based on an internally consistent set of climatological relationships and assumptions of *radiative forcing*, typically constructed for explicit use as input to climate change impact models.

Climate Sensitivity: The average global air surface temperature change resulting from a doubling of pre-industrial atmospheric CO_2 concentrations. The IPCC estimates climate sensitivity at 1.5-4.5^{o}C (2.7-8.1^{o}F).

Climate Variability: Refers to changes in patterns, such as precipitation patterns, in the weather and climate.

Disaster risk reduction (disaster reduction): The conceptual framework of elements considered with the possibilities to minimize vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards, within the broad context of sustainable development.

Emissions: The release of substances (e.g., greenhouse gases) into the atmosphere.

Hazard: A potentially damaging physical event, phenomenon or human activity that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation.

Mitigation of global warming: Actions to reduce greenhouse gas emissions and to enhance sinks aimed at reducing the extent of global warming

Preparedness: Activities and measures taken in advance to ensure effective response to the impact of hazards, including the issuance of timely and effective early warnings and the temporary evacuation of people and property from threatened locations.

Resilience / resilient : The capacity of a system, community or society potentially exposed to hazards to adapt, by resisting or changing in order to reach and maintain an acceptable level of functioning and structure. This is determined by the degree to which the social system is capable of organizing itself to increase its capacity for learning from past experiences and disasters for better future protection and to improve risk reduction measures.

Risk: The probability of harmful consequences, or expected losses (deaths, injuries, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between natural or human-induced hazards and vulnerable conditions.

Vulnerability: the likelihood that an individual or group will be exposed to and adversely affected by a hazard. It is the interaction of the hazards of place (risk and mitigation) with the social profile of communities. Cutter (1993)

Sources:
IPCC: http://www.ipcc.ch/glossary/index.htm
ISDR: http://www.unisdr.org/eng/library/lib-terminology-eng%20home.htm
Pew Center on Global Climate Change: http://www.pewclimate.org/global-warming-basics/full_glossary
Wikipedia: http://en.wikipedia.org/wiki/Glossary_of_climate_change

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Appendix A

Questions for organisations at national level (Government/NGOs etc)

Area of focus

1. What is your organisation mandated with doing / providing?
    a. In what sector, area and at what scale do you work?
    b. Who is your target group?
2. What are some of the areas of knowledge addressed in this function? (e.g if educational, what are some of the topics that you educate people on; is climate addressed explicitly or as a secondary factor)

Disaster and climate activities

3. What activities does your organisation undertake related to disaster risk reduction?
4. What activities does your organisation undertake related to addressing the experienced or expected impacts of climate variability and change?
    a. If currently none, is there an indication that this will be incorporated into your work in the future?
5. If your organisation disseminates information about the effects of and responses to climate change:
    a. How is this developed?
    b. Is this targeted at specific areas/communities or broadly distributed?

Perceptions of communities' impact and response to climate variability and change

6. What have been the impacts of natural disasters on the livelihoods of poor households?
    a. Are the impacts different for women and men?
7. Are there other impacts that climate variability has on the livelihoods of poor households?
    a. Are the impacts different for women and men?
8. Do you think climate change is being experienced in your country? If so,
    a. What is the nature of it?
    b. How aware are people (the public, the government) of this?
9. What are communities doing to prevent natural disasters or mitigate their impact?
10. What support do you think is needed to better help communities respond to a changing climate?

National context

11. What are the key drivers in the choice economic and social development plans? e.g. bound by policy (are policy processes broadly consultative), response to changes/developments within the country, international pressure
12. Is there strong support for addressing climate change issues at the national level and if so, who are the main actors and what policies exist or are in the formulation process?
13. Is there money allocated / ring-fenced specifically for undertaking DRR and/or climate adaptation work? If so, please elaborate.

14. Are there lessons from mainstreaming DRR into sectoral activities that could be applied to doing the same for adaptation?
15. How is your country experiencing or engaging in the international climate change processes? e.g. UNFCCC including NAPA project implementation and decision making around post-2012 Kyoto agreements, operationalisation of adaptation fund, etc.

If appropriate - Nature of activities and impact

16. Are there mechanisms in place to monitor the organizations' impact over time?
17. What has been the basis for the choice of programming / activities undertaken or to be undertaken e.g. have these been in response to a development need, a disaster or climate event(s)?

Questions for organisations at local level (CBOs, key stakeholders, project partners)

Area of focus

1. Does your organisation work directly with local communities? (If yes, please give area/names)
2. Please list specific community based projects that your organisation is involved in or planning, relating to:
    a. Disaster preparedness
    b. Climate change issues
    c. Environment and links to livelihoods, health, food security, etc.
3. If none of the above apply (e.g. your organisation focuses more on development, health or education issues), are there steps underway to include any of these aspects in your work in the future? And if so, what has motivated this shift in orientation?

Perceptions of communities' impact and response to climate variability and change

4. In the process of undertaking community based projects, have you found that people are perceiving longer term changes in the climate they experience (e.g. a change in the frequency and/or magnitude of extreme events or a change in average temperature and/or rainfall between generations) or do they speak only of natural climate variability i.e. fluctuations on the seasonal and inter-annual time scales, including periodic extreme events?
5. What have you found are the aspects or impacts of climate variability and change that are concerning local communities?
    a. Are the concerns of men and women different?
    b. Are communities that rely on certain livelihood activities more vulnerable than others? If so, please explain.
6. In your work, are you aware of any local based responses or adaptations to climate stress?
7. What are some of the challenges and barriers that local communities face in responding to climate stress?
8. What are some of the other challenges and priorities you think local communities have to, or choose to, deal with before they are likely to address climate change? And if so, how do you think these other challenges will be impacted by climate change?

9. What support is needed to help communities prepare for and respond to climate challenges and disaster events more successfully? Does this need to different for men and women?

If appropriate - Nature of activities and impact

10. Are there mechanisms in place to monitor the organizations' impact over time? Are stakeholders involved in this process?
11. What have been the main drivers in the strategic decision to include climate dimensions into the work of the organisation?
12. Have you had to secure specific funding for undertaking these new climate components and how was this done?

Questions for community groups/individuals at village level (CBOs, FBOs, key stakeholders, project participants)

1. What are some of the biggest challenges you face as a community?
2. Could you please talk about what aspects of your livelihoods depend on the environment?
3. How does the weather affect your activities? [Expand]
4. What kinds of extreme weather events do you experience here?
5. Does the change in rainfall between years impact on you? If so, how?
    a. Are there any activities you do or can do in order to decrease the negative impact of this variability?
    b. What makes some people do these and others not? [i.e. what are the enabling and disabling factors that lead to differentiated vulnerability within the community]
6. How do droughts impact the community? What is done to prepare for these events? What is done to recover from these events?
7. How do floods impact the community? What is done to prepare for these events? What is done to recover from these events?
8. How would you say are men and women affected differently by changes in the climate or the environment more generally?
9. Are there things you think would help you ensure that the climate does not impact as negatively on your livelihoods? What are the barriers for doing this?
10. Have you received help from government agencies or NGOs in undertaking these activities?
    a. What and from who?
    b. Did they approach your community or did you apply / ask for assistance?
11. Are there ways you can use the climate variability positively to your benefit?
12. Have people noticed any gradual changes in the overall weather patterns in this area? Are things different now than they were 15 years ago or between your lifetime and your parents' lifetime? [Please describe]
13. Are you expecting any changes in the climate or environment in the future, in your lifetime or that of your children?