



Climate Change and Poverty in Tanzania

realities and response options for CARE



Dr. Charles Ehrhart and Michelle Twena, November 2006

Background report
CARE International Poverty-Climate Change Initiative

Index

Foreword	2
1. Executive summary	3
2. Climate change projections	4
2.1 Regional projections	4
2.2 Climate change in Tanzania	6
2.2.1 Temperature	6
2.2.2 Rainfall patterns	6
2.2.3 Extreme weather events and conditions	7
2.2.4 Sea-level rise	8
3. Climate change and poverty	9
3.1 Food security	9
3.2 Livelihoods productivity	9
3.3 Livelihoods opportunities	10
3.4 Water resources	11
3.5 Human health	12
3.6 Scarcity, conflict and displacement	12
3.7 Gender	13
4. International and national responses to climate change	14
4.1 The national response to climate change	14
4.2 Stakeholder participation	14
4.3 Mainstreaming climate change in government policies and plans	14
5. Climate change and CARE	15
5.1 Mitigation – Description	15
5.2 Mitigation – Assessment	16
5.3 Adaptation – Description	18
5.3.1 Reducing climate-associated risk	18
5.3.2 Strengthening adaptive capacity	19
5.3.3 Mainstreaming climate change considerations	19
5.4 Adaptation – Assessment	20
5.5 Advocacy – Description	22
5.6 Advocacy – Assessment	22
6. Conclusions	24
7. Appendices	25
Appendix 1: Multiple benefit carbon sequestration in the Eastern Arc	25
Appendix 2: Analysis of country programme and staff recommendations	26
8. References	28

Foreword

Climate change is already occurring. No one will be immune from its overall impacts. Nonetheless, it will have a disproportionate effect on the lives of poor people.

Worldwide average surface temperatures have increased by an estimated 0.8°C (1.4°F) between 1900 and 2005. The past decade was the hottest of the past 150 years and perhaps the last millennium. The hottest 22 years on record have occurred since 1980, and 2005 was the hottest of all. The nearly universal consensus amongst scientists is that this warming trend has been triggered by the emission of carbon dioxide and other greenhouse gasses by human activities (e.g. industrial processes, fossil fuel combustion and land use changes such as deforestation). Moderate projections of future warming suggest a global increase of 1.4°C (2.5°F) to 5.8°C (10.4°F) by 2100. In some areas, such as Southern Africa and the Sahel, the rise in temperatures could be double these averages.

Regardless of how fast or how much the climate will eventually change, it is already:

- **Altering hydrological cycles.** In many semi-arid and arid regions around the world, less rain is falling, and that which does is evaporating faster due to climbing temperatures. Meanwhile, many areas which have long been susceptible to flooding are getting even more rain.
- **Altering weather patterns.** In other places, total rainfall hasn't changed so much, yet the timing and duration of rains has. In other words, seasons have become less predictable and, in many cases, more volatile.
- **Raising sea levels.** Melting ice caps are expected by conservative climate change models to result in an average sea level rise of 9 to 88 centimeters by 2100.
- **Increasing the intensity, and frequency, of extreme weather conditions and events** such as torrential rains, droughts, tropical storms, cyclones and hurricanes.

With the launch of our *Poverty-Climate Change Initiative* in July 2006, CARE International (CI) has begun adapting its worldwide programming to these climate change realities. The first step is a seven-month internal process of learning about, reflecting upon and planning an appropriate response to climate change. The process begins and ends with those staff in Country Offices (COs) who are working directly with the people CARE serves.

This "country profile" is one in a series of six developed together with COs in Africa, Asia and Central America which examines current climate conditions, climate change projections and practical implications for CARE's programming. As such, it is meant to help COs learn about the importance of climate change and kick-start their response. At the same time, country profiles are intended to communicate the kinds of support from Regional Management Units, Members and the CI Secretariat that COs think they will need to meet this unprecedented challenge. In other words, these country profiles are intended to have direct use-value for nearly everyone in CARE. Main messages coming out of the country profiles will be presented in a summary report.

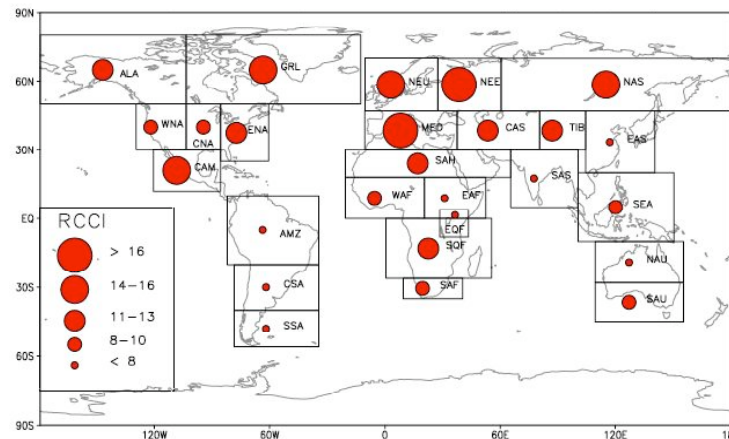
It was difficult to select countries to highlight in this relatively small series of six profiles. Interest from COs was high, and the case to include specific countries was frequently strong. The main selection criteria were the extent to which local populations may be affected by climate change and the extent to which conditions (and projections) in different countries fit together to illustrate a range of climate change impacts.

Niger (Sahel), Tanzania (East Africa), Mozambique (Southern Africa), Nepal (Central Asia/Southwest Monsoon Region), Indonesia (Southeast Asia/Northeast Monsoon Region) and the four small countries comprising CARE’s Central America Region – namely, Guatemala, Honduras, El Salvador and Nicaragua – were chosen. This decision was informed by the Intergovernmental Panel on Climate Change’s *Special Report on the Regional Impacts of Climate Change* (IPCC 1997) the Regional Climate Change Index (RCCI), and other peer reviewed sources.

The RCCI is a comparative index designed to identify those regions which will be most affected by climate change. The identification of these ‘hot-spots’ is based on regional mean precipitation change, mean surface air temperature change, and change in precipitation and temperature interannual variability.

Calculated for 26 land regions from the latest set of climate change projections by 20 global climate models for the A1B, A2 and B1 IPCC emission scenarios, the RCCI identifies Central America as the most prominent tropical hot-spot for climate change (Giorgi 2006). The highlands of Central Asia will also be very hard hit. Though Africa may undergo fewer changes than Central America or Central Asia – and East Africa less than Southeast Asia – the consequences may be even more severe “because of factors such as widespread poverty, recurrent droughts, inequitable land distribution, and over-dependence on rain-fed agriculture” (IPCC 2001: 489, 491).

Regional Climate Change Index (RCCI)



The country profile you are about to read examines these consequences and what CARE can do under such conditions to ‘create a world of hope, tolerance and social justice, where poverty has been overcome and people live in dignity and security.’

Dr. Charles Ehrhart
 Coordinator
 Poverty-Climate Change Initiative¹
 CARE International

¹ In addition to this series of country profiles and a summary report, CI’s Poverty-Climate Change Initiative will also be producing:

- A review of ways in which other civil society organizations perceive and are addressing climate change
- An inventory of CI members and country offices that are already undertaking poverty reduction/Disaster Risk Reduction activities related to climate change; areas of relevant expertise that already exist within CI members and country offices; and current or potential partnerships that could advance CARE’s work on climate change
- An overview of funding opportunities and trends amongst donors
- A final report including recommendations from the Poverty-Climate Change Task Force

CARE-Austria, Canada, Denmark, Netherlands, USA and the Tanzania Country Office are funding these activities. The Coordinator is being advised and supported by a Task Force composed of representatives from each of CI’s regional offices and funding members. In addition, a Climate Change Learning Group has been formed to backstop the Task Force, aid in disseminating important information and spearhead the implementation of decisions. Membership in this Learning Group is open to all CARE staff. For further information, contact the Coordinator at: charlesehrhart@gmail.com

1. Executive summary

According to the United Nations' panel of climate experts, Africa is "highly vulnerable" to the impacts of climate change "because of factors such as widespread poverty, recurrent droughts, inequitable land distribution, and over-dependence on rain-fed agriculture" (IPCC 2001: 489, 491). Historical data shows that the continent is already undergoing climate change. This has serious implications for water resources, food security, the spread of disease, the productivity of natural resources, sea-level rise, and desertification (ibid.: 489). Large-scale events (such as the ongoing drought in the Horn of Africa, the 1998 floods in East Africa and the 1997/8 and 2000 floods in Mozambique) illustrate ways in which many communities are already suffering from less predictable – and more extreme – weather patterns.

As the largest, most populous, and poorest country in East Africa, Tanzania is likely to feel the impacts of climate change more than most. Diverse climatic conditions, corresponding to the country's varied topology, mean that national trends are likely to mask considerable variation at the sub-national level.

Extreme events are likely to pose the greatest climate change threat to Africa (WGCCD 2005). In Tanzania, they are likely to take the form of drought, floods and tropical storms – all of which are expected to become more frequent, intense and unpredictable (IPCC 2003).

Recent extreme weather *conditions* and *events* highlight the country's vulnerability to climatic hazards. The 1997/8 El Niño, for example, led to drought and flooding, and triggered a national food emergency with severe food shortages, 'skyrocketing' food prices, increases in power rationing, and extensive food, cattle and cash crop losses (US National Drought Mitigation Center 1997).

It is, therefore, no wonder that Country Office (CO) staff draw strong linkages between climate change, their mission and activities – especially with regards to health, education, natural resource management, entrepreneur development and gender. Staff recommend for their CO to mainstream climate change considerations in *all* programming so as to maximise the sustainability of development outcomes and ensure continuing support from donors. In addition, staff feel climate change should inform the CO's LRSP – including decisions about where CARE works and the types of projects it prioritises.

Staff think CARE should begin to position itself strategically on the issue of climate change and, eventually, undertake mitigation, adaptation and advocacy activities. Although CARE in general, and CARE-Tz in particular, already have many of the skills, experiences and relationships necessary to address climate change, the way forward is not without substantial challenges. In order to support the CO in its efforts, staff suggest that CI should develop tools to help bring current and future projects in-line with climate change realities.

The CO's capacity to utilise such tools will require ongoing technical support – especially when first introduced. At both national and international levels, CARE should participate in and/or establish networks with other development-oriented NGOs to share practical experience and refine its ways of working. If it does so, CARE will be at the forefront of those institutions who understand – in the words of the U.K.'s Foreign Secretary, Ms. Margaret Beckett – that "Dealing with climate change is an imperative for today, not an option for tomorrow" (Beckett 2006).

2. Climate change projections

2.1 Regional projections

According to the United Nations' panel of climate experts, Africa is "highly vulnerable" to the impacts of climate change "because of factors such as widespread poverty, recurrent droughts, inequitable land distribution, and over-dependence on rain-fed agriculture" (IPCC 2001: 489, 491). Historical data shows that the continent is already undergoing climate change. Temperatures rose by 0.7°C during the 20th century, and changes in rainfall patterns saw reduced precipitation in the Sahel and a net increase across the eastern central regions.

Current projections are unanimous in agreeing that these trends – i.e. increasing temperatures and changing rainfall patterns – will continue. Indeed, temperatures are due to rise by a further 0.2 to 0.5°C *per decade*, and the impact on hydrological cycles is likely to cause reduced rainfall in southeast Africa (and possibly the Sahel), and more precipitation in those parts of East Africa which have historically been "wetter" (ibid.: 489, 494).

These changes have serious implications for water resources, food security, the spread of disease, the productivity of natural resources, sea-level rise, and desertification (ibid.: 489). Large-scale events (such as the ongoing drought in the Horn of Africa, the 1998 floods in East Africa and the 1997/8 and 2000 floods in Mozambique) illustrate ways in which many communities are already suffering from less predictable – and more extreme – weather patterns.

In East Africa, climate change will be directly felt in terms of:

- Higher temperatures
- Changes in the timing and quality of rains
- An increase in the frequency of climate hazards (for example, floods, droughts, cyclones and tropical storms)
- Sea-level rise

Under the most conservative warming estimates,² more rain is expected between December and February (5-20 per cent), and less between June to August (5-10 per cent) (ibid.: 494). Under more rapid warming scenarios, parts of East Africa may see up to *double* the precipitation, while semi-arid areas are likely to receive (even) less rain than at present (ibid.). These climate impacts are likely to increase the region's vulnerability to deforestation, loss of forest quality, degradation of woodlands, coastal erosion, coral bleaching and sea-level rise (see Figure 1).

These profound changes will affect the livelihoods, health, and security of East Africa's population. Most households' reliance on natural resources and rain-fed subsistence farming means they are already vulnerable to climate hazards, which are expected to become ever more frequent as climate change accelerates. These outcomes will have serious implications in a region where malnutrition is already widespread, the need for emergency food aid is recurrent, and food security is routinely affected by extreme weather events (Kadomura 1994, Scoones *et al.* 1996, IPCC 2001: 491, 507). In fact, it is estimated that more people will soon be displaced by environmental disasters in central and north-eastern Africa than by war or political upheaval (Conisbee and Simms 2003). Given that *current* water scarcity is already aggravating tensions between local communities, it may also have consequences for

² See IPCC 2001: 494 for an explanation of the different warming scenarios employed in this study.

regional stability. The ongoing drought in northern Kenya, for example, has led to water shortages and triggered the violent conflict among pastoralists, and between pastoralists and farmers, which has spilled over into Uganda. Ethiopian troops have also moved into northern Somalia to stop pastoralists entering their country (Christian Aid 2006: 29-30).

Figure 1: Vulnerability to climate change in Africa

Source: UNEP/GRID-Arendal



2.2 Climate change in Tanzania

As the largest, most populous, and poorest country in East Africa, Tanzania is likely to feel the impacts of climate change more than most. Diverse climatic conditions, corresponding to the country’s varied topology, mean that national trends are likely to mask considerable variation at the sub-national level. The following section explores what climate change will mean for Tanzania and its regions in terms of changes in temperature, rainfall patterns, the frequency and intensity of extreme weather events (and conditions), and sea-level rise.

2.2.1 Temperature

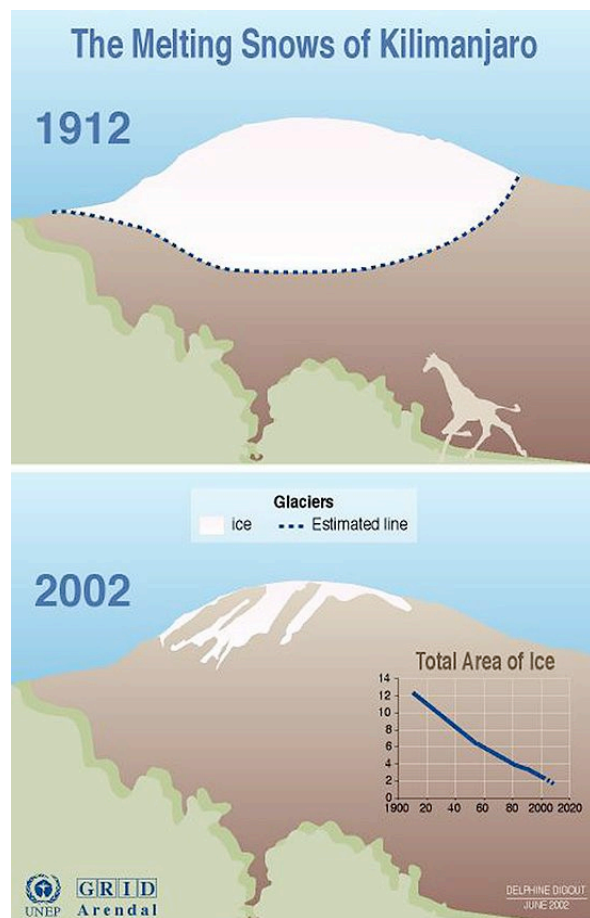
According to a study commissioned by the Government of Tanzania, climate change is expected to raise mean annual temperatures by 3-5°C, and average daily temperatures by 2-4°C by 2075 (Tanzanian Initial National Communication, Vice-President’s Office, 2003: 28). A report by the OECD is somewhat more conservative, predicting an average annual increase of 2.2°C by 2100 (Agrawala *et al.* 2003: 13). Both studies agree, however, that the rise in temperature will be greater during cooler months (June to August) than warmer ones (December to February). The Tanzanian research also points out that increases will be most marked in central and western regions, where temperatures may rise by up to 4°C, and less striking in north-eastern areas, where there may be a warming of up to 2.1°C.

The most iconic indication of climate change is, arguably, the glacial retreat being observed on Mount Kilimanjaro (Agrawala *et al.* 2003: 29). Figure 2 illustrates the decline in the volume of ice at the mountain’s summit between 1912 and 2002, and projects that if current trends persist, the glacier may disappear entirely by 2020. Aside from the symbolic significance for a mountain whose Swahili name – Kilima Njaro or “shining mountain” – is derived from its ice cap, there will be considerable implications for the local ecosystem, which provides critical water services and supports the livelihoods of over a million local inhabitants (*ibid.*).

2.2.2 Rainfall patterns

Rainfall predictions are less certain. Indeed, major discrepancies remain between climate models. However, the most commonly used projection for Tanzania foresees

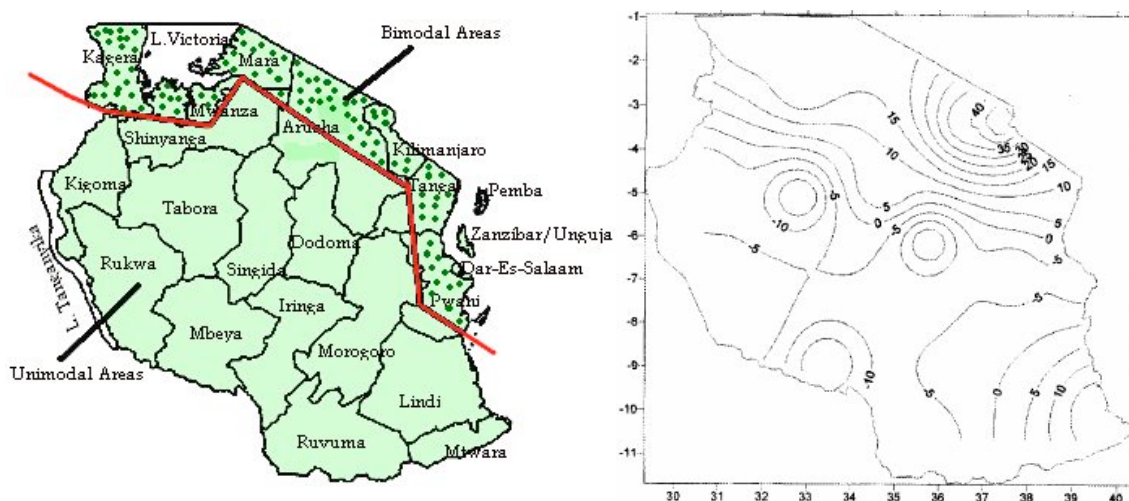
Figure 2: Climate change on Mt. Kilimanjaro
Source: UNEP/GRID-Arendal



annual rainfall increasing by 10 per cent overall. According to this model, the timing of rains will become less predictable and their intensity, more volatile (Agrawala *et al.* 2003: 13; IPCC 2003). Seasonal variations will become accentuated, with a 6 per cent decline in rainfall between June and August (traditionally the ‘dry’ season), and a 16.7 per cent increase between December and February (the main rainy season) (Agrawala *et al.* 2003: 13).

Significant regional variations will also occur. Areas with a ‘bimodal’ rainfall pattern, i.e. two rainy seasons (long rains March-May and short rains October-December), can expect to receive 5 to 45 per cent more rain during both seasons. This applies to north-east, north-west and northern regions. Areas with a ‘unimodal’ rainfall pattern on the other hand, characterised by one main rainy season (December to April), will see reduced precipitation of between 10 and 15 per cent. This will occur in central, western, southern, south-western and eastern Tanzania, as illustrated by Figure 3.

Figure 3: Rainfall patterns (left), Change in mean annual rainfall based on 2xCO² (right)
 Sources: FSIT 2005a: 4; Mwandosya *et al.* 1998: 19



2.2.3 Extreme weather events and conditions

While local coping strategies may be able to deal with such shocks in the short-term, they are unlikely to be able to cope with more frequent and severe climate events.

Extreme events are likely to pose the greatest climate change threat to Africa (WGCCD 2005). In Tanzania, they are likely to take the form of drought, flooding, tropical storms and cyclones, which are expected to become more frequent, intense and unpredictable (IPCC 2003).

Slow onset extreme weather *conditions*, such as the recent drought, and sudden *events*, such as the El Niño episode of 1997-98, highlight the country’s vulnerability to current climatic hazards. The El Niño event, for example, led to drought and flooding, and triggered a national food emergency, with severe food shortages, ‘skyrocketing’ food prices, increases in power rationing, and extensive food, cattle and cash crop losses (US National Drought Mitigation Center 1997). It was reported that villagers walked up to 50km to collect emergency aid rations (*ibid.*). Meanwhile, flooding damaged human settlements, infrastructure, property and livelihoods, and was associated with the spread of malaria, cholera and diarrhoea (Initial National Communication 2003: 42, IPCC 2003).

While local coping strategies may be able to deal with such shocks in the short-term, they are unlikely to be able to cope with more frequent and severe climate events. Indeed, selling assets such as livestock and household goods as a coping mechanism can leave households more vulnerable to both poverty and climate change in the long-run (Orindi *et al.* 2005: 7).

2.2.4 Sea-level rise

As global warming causes polar ice caps to melt, the IPCC predicts sea-level rise of 8 to 96cm by 2100. With an 800km coastline, and a coastal population of 16 per cent, sea-level rise is likely to have a considerable impact on Tanzania's coastal communities and the ecosystems they depend on for their livelihoods. The Tanzanian Government identifies the regions likely to be hardest hit as: Dar es Salaam, the Coastal region, Mtwara and Lindi. Damages in Dar es Salaam alone are estimated to reach US\$48-82 million (based on sea-level rise of 0.5 and 1m respectively) (Tanzanian Initial National Communication 2003: 38). Other impacts include (from *ibid.* and the forthcoming NAPA):

- Land loss of 247 - 494 km² (based on sea-level rise of 0.5 and 1m respectively)
- Coastal erosion Damage to coastal structures and properties
- Loss of coastal and marine ecosystems (e.g. mangroves, fish, coral)
- Saline intrusion in fresh water bodies (e.g. the Rufiji delta)
- Inundation of low-lying coastal areas

3. Climate change and poverty

Poor people are particularly vulnerable to climate change because poverty:

- Is often linked to a higher reliance on natural resources. This makes poor people more sensitive to changes affecting the environment *and* can lead to degradation of natural resources – thus creating a vicious circle of increasing vulnerability to climate change (Tschakert 2006)
- Constrains people's adaptive options/capacity.

Climate change is an 'underlying cause of poverty' in that it triggers – or worsens – a wide range of immediate and intermediate *causes* of poverty.

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Slowly changing climatic conditions and more frequent extreme events are likely to pose a threat to food and livelihood security, water supply, and human health. Because different social groups will feel the impacts of climate change disproportionately, there may also be consequences for social cohesion and gender equality. In areas where marginal groups struggle to gain access to increasingly degraded and scarce natural resources, climate change can lead to displacement and violent conflict. These issues are discussed in further detail below.

3.1 Food security

According to government statistics, over a third of Tanzanians (36 per cent) live below the basic needs poverty line and almost one in five (19 per cent) survive below the food poverty line (Government of Tanzania 2005: 2). Agriculture – including livestock – is of central importance to livelihoods, providing income and employment to 80 per cent of the population (NAPA, forthcoming). As the sector is dominated by rain-fed, subsistence production, food security is particularly vulnerable to climate variability and change. This was confirmed by stakeholders consulted as part of the government's preparation for the Poverty Reduction Strategy Paper (see Box 1).

Indeed, two-thirds of food imports to Tanzania in the 1990s took the form of food aid (IPCC TAR 2001: 502), and the recent drought and subsequent poor crop yield in many parts of the country has led to "severe hunger" (NAPA, forthcoming). Farmers in the Dodoma region, for example, have reported an 80 per cent fall in expected yields due to the late and poor rains (Naess 2006). Furthermore, Food

Box 1: Climate change and food security

"A main concern of the poor is their vulnerability to unpredictable events. In Tanzania, famine often results from either floods or drought. Since the mid-1990s, Tanzania has in fact experienced a series of adverse weather conditions, which undermined food security." (cited in Agrawala 2003: 28)

Assessment Reports conducted by Food Situation Investigation Team in 2005 demonstrated that poor short rains ("vuli") resulted in food relief distribution in over half of the districts in the north-east and coastal regions. Kilimanjaro was found to be one of the hardest-hit regions, despite traditionally being an area receiving heavy vuli rains (NAPA, forthcoming).

3.2 Livelihood productivity

Maize yields are predicted to fall by 12 per cent in the southern highlands, 17 per cent in the Lake Victoria basin, 22 per cent in the north-eastern highlands, and 84 per cent in Dodoma and Tabora (INC 2003: 34-5)

Climate change is likely to affect food security by influencing livelihood productivity and opportunities. For the most part, impacts will be negative. Erratic weather will undermine rain-fed agricultural systems; heat stress on crops will reduce yields; increases in carbon dioxide concentrations will decrease the protein content of vegetation, with implications for human and livestock health and productivity; rising rates of evapo-transpiration will

increase pressure on water supplies (especially in areas where river runoff is reduced and shallow wells become unreliable); rates of disease will rise for humans, plants and livestock; salt water incursions will contaminate water supplies and damage ecosystems; sea-level rise will claim land in low-lying, populated coastal areas (especially Dar es Salaam and the Coastal region); environmental services will decline (e.g. water and biodiversity); and higher ocean temperatures, salinity and acidity will devastate marine organisms and fisheries. Given the importance of agriculture in Tanzania, climate change consequences for the sector are presented in more detail in Box 2.

Box 2: Impacts of climate change on agriculture

Sources: *Initial National Communication 2003, NAPA forthcoming, IPCC 2001*

Agriculture

- Unpredictable rainfall will lead to uncertainty in cropping patterns
- Areas with less rainfall will lose water through evapo-transpiration and require irrigation
- Regions with increased rainfall will experience nutrient leaching, soil erosion and water logging
- The incidence of pests & disease will rise in areas with increased rainfall
- Prolonged dry spells may extend beyond normal patterns
- Decline in maize yields by 33 per cent overall
- Cotton yields expected to fall in some areas, rise in others
- Shifts in agro-ecological zones
- Increased weed competition with crops for moisture, nutrients and light

Livestock

- Favourable condition for ticks, snails, blood-sucking insects and pests outbreaks
- Increased East Coast Fever and Rift Valley Fever
- Eruption of new pests and diseases
- Reduced productivity (draught power, milk and meat) as increased carbon dioxide reduces protein available from vegetation
- Livestock deaths due to heat waves

Many climate impacts on livelihoods will be felt indirectly. For example, livestock distribution and productivity may be affected through changes in the prevalence of (vector-borne) livestock diseases, and in the quantity and quality of rangeland (IPCC 2001, INC 2003: 35). For example, it has been suggested that the distribution of the tsetse fly could shift into north-east Tanzania, which would reduce the area of land suitable for grazing and human settlement (IPCC 2001: 507). Milk and meat production are also likely to fall as climate change reduces the livestock carrying capacity of already over-stretched rangeland areas.

3.3 Livelihood opportunities

Some climate change coping strategies worsen people’s long-term prospects for escaping poverty. Box 3 explains how this may already be happening.

Box 3: Climate change and livelihood opportunities

Source: *Paavola 2004*

A study in Morogoro found that farmers’ ways of coping with *current* climate variability were increasing their vulnerability to *future* poverty and climate change:

Current coping strategies	<ul style="list-style-type: none"> ○ Expanding cultivation; reducing fallow; switching crops; engaging in wage employment; charcoal, timber and brick production; temporary/permanent migration (to gain access to land or markets)
Short-term consequences	Farming practices and reliance on forest resources have led to: <ul style="list-style-type: none"> → Soil erosion → Deforestation
Medium-term consequences	<ul style="list-style-type: none"> → Reduced water retention → Increased flooding after rains → Reduced water flow between rains
Long-term effect	<ul style="list-style-type: none"> → Eroded natural resource base may not be able to provide the same safety-net for livelihoods in future times of crisis

Furthermore, as biodiversity comes under increased threat from climate change, existing coping strategies may become less reliable (Jallow 1995); for example, a study in Kenya found that wild foods used by pastoralists in the south were becoming increasingly scarce (Campbell 1999).

3.4 Water resources

The number of Africans living with water scarcity is predicted to double from 300 million people in 1990, to 600 million by 2025 (World Bank 1995)

The availability of freshwater in Tanzania is expected to decrease by over half from 1990 levels by 2025 (Sharma *et al.* 1996).³ Although water scarcity is unlikely to occur (as predicted for neighbouring Kenya, Rwanda, Burundi and Malawi, UNEP/GRID-Arendal 2006), water stress will become an increasing problem, providing cause for concern in a country where a quarter of the population already spends over 30 minutes per day walking to collect water (Initial National Communication 2003: 5).

Box 4 details how climate change is expected to affect the flow of three major Tanzanian rivers. It provides a good example of the way in which regional impacts for water supply will vary. In addition to changes in river flow, areas with reduced rainfall will suffer from higher rates of evapo-transpiration, reduced surface water and soil moisture, slower aquifer recharge rates, and falling water table levels due to higher temperatures.

Box 4: Impact of climate change on the flow of three key Tanzanian rivers

Sources: Initial National Communication 2003

- Decrease in annual flow of the Pangani River of between 6 and 9 per cent
- 10 per cent fall in annual flow of the Ruvu River
- Increase in annual flow of the Rufiji River of 5 to 11 per cent, with the “potential for heavy flood damage” increasing during the long rains (March to May)

For example, reduced flow from the Pangani and Ruvu Rivers (supplying the regions of Dar es Salaam, Tanga, Kilimanjaro, Arusha and “Coastal”) will coincide with reduced rainfall and increased demand for water, resulting in uncertain supply for agriculture (e.g. small-scale rice farms in lowland areas). Regions with more precipitation, on the other hand, will become increasingly prone to flooding, which may reduce the volume of ‘useful’ water available to them, and have negative repercussions for agriculture in terms of water-logging, leaching of nutrients and washing away of topsoil.

Climate change will also have significant indirect impacts on water supply. A recent study found that increases in the number and intensity of wild fires (caused by reduced precipitation and humidity), combined with forest clearing, may have a more devastating impact on the Kilimanjaro ecosystem and downstream water supply than the melting glaciers (Hemp 2005).⁴ This is because forests at high altitudes collect fog and rain, which filter down to groundwater and streams. As fires and deforestation cause the forest belt to recede downwards, however, water supply is expected to become less reliable, putting the one million people living on the mountain in danger of water stress. Forest and bush fires have also contributed to

³ From approximately 3,000m³ per capita in 1990 to under 1,500m³ by 2025 (Sharma *et al.* 1996, cited in IPCC 2003: 498)

⁴ The glacier contributes one million cubic meters to water supply, while forest cover contributes 500 million cubic metres (Hemp 2005: 1019).

the destruction of forest resources in the Uluguru mountains, which could have similar implications for the water security of downstream communities (NAPA forthcoming: 30).

These changing trends in water supply are likely to have further socio-economic repercussions: they may lead to power shortages due to reduced rainfall in some hydropower regions and flood damage to plant structures in others (e.g. Rufiji and Pangani River basins); the cost of realising the UN Millennium Development Goals is likely to rise as poor access to water impacts adversely on livelihoods, health and productivity; and finally, water stress may exacerbate political tensions, raising the scope for conflict within and across national borders (see Section 3.4).

3.5 Human health

182 million people in sub-Saharan Africa alone could die of disease directly attributable to climate change by the end of the century (Christian Aid 2006)

Climate change affects human health directly – through injury, death and disease resulting from extreme events – and indirectly, through changes in water quality, air quality, food availability and quality, and the range, frequency and severity of disease, as summarised in Box 5.

Box 5: Impact of climate change on health

Sources: IPCC 2001, NAPA forthcoming, WGCCD 2005

- Direct health impacts of weather-related disasters (floods, storms, drought)
- Heat stress
- Expansion in the range, frequency and severity of diseases such as malaria, cholera, dysentery, meningitis, shistosomiasis, Rift Valley Fever and diarrhoea
- Impacts on food security
- Loss of biodiversity leading to reduced availability of medicinal plants
- Air pollution
- Demographic changes shift balance of vulnerable populations demanding different health services

There is growing evidence to suggest that climate-driven threats to health are already on the increase. For example, higher annual temperatures in high altitude communities, such as those around Kilimanjaro and the Usambara mountains, have been linked to expanding malaria transmission (NAPA forthcoming, Lindsay and Martens 1998). Meanwhile, populations living on the Indian Ocean and Great Lakes are at greater risk of cholera infection as extreme events (such as El Niños) become more frequent and generate increasingly favourable conditions for disease transmission (Birmingham et al. 1997, Shapiro et al. 1999, IPCC 2001).⁵

3.6 Scarcity, conflict and displacement

“Although many conflicts are politically instigated and driven by underlying political inequities in resource access rather than climate change as such, increasing drought stress can exacerbate conflict and violence” (Eriksen 2005)

Climate change is projected to cause an *additional* 50 million environmental refugees worldwide by 2010 and 150 million by 2050 (Myers 1994). There are indications that freshwater scarcity and land degradation are already leading to changes in human settlement patterns. Even now, the number of livestock is

surpassing the land’s carrying capacity in north-west and central Tanzania – by close

⁵ For more a more detailed treatment of the impacts of climate change on health see the following: Birmingham *et al.* 1997, Hart and Cuevas 1997, Lindsay and Martens 1998, WHO 1998, Shapiro *et al.* 1999, IPCC 2001: Chapters 9 and 10, Yanda *et al.* 2005, NAPA, forthcoming.

to 100 per cent in Mwanza, Shinyanga, Singida and Dodoma – causing herders to travel further south with their livestock. This raises the potential for conflict between farmers and pastoralists as fields and rangelands become scarcer and less productive (Ministry of Livestock 2005, cited in NAPA forthcoming). Moreover, as already dry areas see reduced rainfall and further water is lost through evapotranspiration (due to increased temperatures), the rising need for irrigation will place even greater pressure on water supplies as shallow wells become unreliable and river runoff levels fall (NAPA, forthcoming). Access to water resources is already causing tensions in the Dodoma region (Naess 2006). According to a recent study in the Usangu Plains, villagers are already drawing linkages between environmental change, resource conflicts and worsening poverty (Malley *et al.* 2006).

Water scarcity is likely to be far more severe in neighbouring countries, such as Kenya, Rwanda, Burundi and Malawi. Tensions resulting from this scarcity could spill across national borders into Tanzania, as has already occurred in Uganda, Ethiopia and Somalia.

3.7 Gender

As the main natural resource users and managers in rural Tanzania, the adverse effects of climate change are likely to be felt disproportionately by women. However, as vulnerability to climate change depends on control of financial, physical, natural, human and social capital, and because women typically have less access to and control over these resources than men, they are likely to have lower adaptive capacities (Lambrou and Piana 2005).

Research into the consequences of extreme weather events for women has found that:

- Women's economic insecurity increases more than men's
- They take longer to recover from economic loss than men
- Gender barriers provide an obstacle to involvement in reconstruction work
- Natural disasters often lead to a sustained increase in the workload of women (e.g. due to male migration, reduced access to resources, more time spent travelling to collect water and search for fuelwood) (Lambrou and Piana 2005: 15-19).

4. International and national responses to climate change

By signing the United Nations Framework Convention on Climate Change (UNFCCC) in 1992, the international community (comprised of over 180 nations, including the United States) officially acknowledged that human activities were contributing to climate change, and pledged a commitment to achieving “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system” (UNFCCC, Article 2).

4.1 *The national response to climate change*

The Government of Tanzania ratified the Convention on 17th April 1996 and, as part of the international process, published its Initial National Communication (INC) to the UNFCCC in 2003.⁶ The document presented an inventory of national sources of greenhouse gas⁷ emissions, provided an assessment of vulnerability and adaptation to climate change impacts, and suggested policy options for mitigation and adaptation. The Ministry of Environment, under the Vice President’s Office, was responsible for compiling the report and remains the focal point for co-ordinating the government’s climate change response. It is currently in the process of developing a National Adaptation Programme of Action (NAPA),⁸ which seeks to prioritise projects contributing to the national adaptation effort in order to qualify for funding from the Global Environment Facility through the United Nations Environment Programme.

4.2 *Stakeholder participation*

Although a participatory approach is one of the key guiding principles of the NAPA process, there has to date been little evidence of stakeholder consultation or civil society involvement. The actors involved have largely been government-based, and include the National Environmental Management Council, the Ministry of Energy and Minerals, the Ministry of Agriculture and Food Security, the Ministry of Industries and Trade, the Division of Forestry and Beekeeping, the Directorate of Meteorology, and the University of Dar es Salaam. The Centre for Energy, Environment, Science and Technology (CEEST), and to a lesser extent, the Environmental Protection Management Service (EPMS) stand out as lone representatives from the NGO community in a very top-down policy process. There is certainly scope and justification for wider stakeholder involvement should the government initiate a public inquiry before the final NAPA is published, as is expected to be the case (Dietz 2006).

4.3 *Mainstreaming climate change in government policies and plans*

A second important guiding principle of the NAPA process is that it should complement existing national programmes. Unfortunately, not only has the government failed to incorporate climate change in its National Strategy for Growth and Reduction of Poverty (MKUKUTA), Agricultural Sector Development Strategy and Rural Development Strategy, but the issue also appears to be absent from environment policy, with no mention of climate change in the National Environmental Policy (1997) or National Forestry Policy (1998). Perhaps most telling of all, climate change is not mentioned once in government’s National Disaster Management Policy (Prime Minister’s Office 2004) or its recent Review of Drought Preparedness (Amani and Standen 2004).

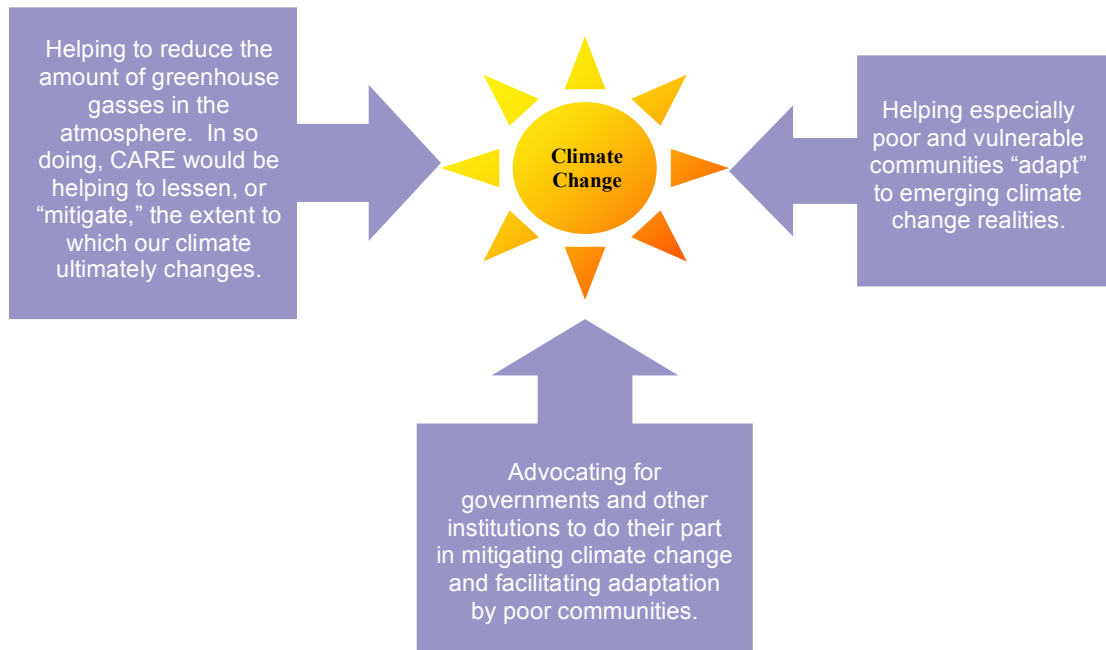
⁶ The INC draws heavily from CEEST’s *Mwandosya et al. 1998*; the lead author is now Minister for Environment.

⁷ The greenhouse gases covered in the report were carbon dioxide and monoxide, methane and nitrous oxides.

⁸ This is an obligation of all 49 Least Developed Countries.

5. Climate change and CARE

There are three major ways for CARE to address climate change:



These options are described in greater detail, and assessed with regards to the Tanzanian context, below.

5.1 Mitigation - Description

Institutions like CARE are already implementing projects that mitigate climate change whilst contributing to poverty reduction and environmental conservation. These projects:

- o Reduce GHG emissions
- o Actively sequester GHGs in 'sinks' and/or
- o Aim to protect demonstrably threatened carbon 'sinks.'

Projects aiming to reduce GHG emissions typically swap inefficient and/or dirty energy technologies for more efficient and/or cleaner alternatives. Headline projects often focus on 'big wins,' such as switching municipalities from coal or diesel generators to a CO₂-free power source. However, some NGOs are already tapping into the UNFCCC's Clean Development Mechanism (CDM) to help poor households adopt technologies that improve their lives. Box 6 provides an example of how this is being done in an African context.



Better homes, lower energy costs and reduced CO₂ emissions in Cape Town, South Africa.

Box 6: Kuyasa Low-cost Urban Housing Energy Upgrade Project, South Africa

Source: <http://www.southsouthnorth.org>

SouthSouthNorth and the Cape Town Municipality have used the UNFCCC's Clean Development Mechanism to finance improvements in the heat retention and energy efficiency of 2,300 low-income housing units. This has proven to be an affordable, replicable and scaleable model for upgrading homes, lowering energy expenditures and reducing CO₂ emissions.

Other reduced-emissions projects are spreading fuel-efficient stoves, new charcoaling technologies and biogas systems in poor communities.

Sequestration projects seek to ‘capture and store’ carbon. They can target CO₂ that would otherwise be emitted by large-scale power plants. They can also pull CO₂ out of the atmosphere and lock it up in trees, other vegetation and soil. The latter type of project, usually classified as ‘Land-use, Land-use Change Forestry’ (LULUCF), can make a substantial contribution to reducing poverty.

Box 7 presents a typical LULUCF design in which low-income farmers are encouraged to switch from clear-cut, mono-crop farms to multi-story, agro-forestry systems. In so doing, households can:

- Get paid for growing trees. Simply put: the more trees farmers grow » the more carbon they sequester » the more money they receive.
- Reduce erosion and improve soil quality. This can yield bigger, and more sustainable, crop harvests.
- Grow ‘non-timber forest products’ (NTFPs), including fruits, fibres and firewood, alongside traditional crops. Amongst other benefits, NTFPs can provide households with a source of income between harvests and when harvests fail.

Box 7: Nhambita Community Carbon Project, Mozambique

Source: <http://www.planvivo.org/projects/projects.html>

The Nhambita Community Carbon Project, operating in the buffer zone of the Gorongosa National Park, Mozambique, uses the *Plan Vivo* model created by BioClimate Research and Development. It is helping improve livelihoods by establishing agro/forestry systems that provide significant income for carbon sequestration and other benefits such as fruit, timber, fodder, and fuel wood, and improved soil structure.

Other project components are enhancing local organisational capacity, building participants’ understanding of forest stewardship/conservation, and supporting novel income generating activities.

The destruction of terrestrial carbon sinks, such as forests and peat bogs, is estimated to constitute up to 25 per cent of global GHG emissions. In order to reduce this figure, some projects are being established to protect demonstrably threatened carbon sinks. At its core, this type of project is about giving natural resource managers – be they rural communities or government authorities – resources to forestall the destruction of carbon sinks. This approach is controversial. Nonetheless, a number of NGOs (including CARE in Indonesia) have received funding to explore its potential. Early results look promising, and the idea is slowly gaining support.

5.2 Mitigation - Assessment

Following an internal process of learning about and reflecting on the implication of climate change for Tanzania, CARE staff recommended that their Country Office:

- Begin implementing ‘multiple benefit’ mitigation projects
- Reduce emissions generated by CARE projects and operations
- Help employees understand the consequences of their actions by suggesting practical steps to avoid contributing to climate change (e.g. turning off lights and office electrical equipment)

They also recommended that CARE International investigate the pros and cons of going ‘carbon neutral’ as a matter of policy.

CARE-Tz staff believe their Country Office should begin implementing ‘multiple benefit’ mitigation projects. Projects to reduce emissions, sequester GHGs and protect sinks are all feasible and could be established under the auspices of the CO’s

Natural Resources and Livelihoods Sector. For instance, CARE and its partners (e.g. the Tanzania Forest Conservation Group) already have experience promoting fuel-efficient cook stoves. However, they do not know how to use the CDM and voluntary carbon markets to improve the proportion of households adopting improved cook stoves or finance the scaling-up of successful pilots. SouthSouthNorth has recently begun working with the Tanzania Traditional Energy Development and Environment Organisation (TATEDO) and the Centre for Energy and Environment Science and Technology (CEEST) to design CDM-compliant projects promoting fuel-efficient cook stoves. CARE could partner with SouthSouthNorth to benefit from its expertise or link up later with TATEDO and CEEST. There are other options, such as hiring specialised consultants. Regardless of the strategy it chooses to pursue, the CO will surely need technical support to navigate the process of 'selling' carbon credits.

Even more striking opportunities exist with regards to LULUCF. Ongoing NRM projects in the Uluguru and South Nguru Mountains, as well as Zanzibar, could provide a foundation for designing and implementing carbon sequestration activities. Though CARE-Tz has no experience in carbon sequestration, it does have a background in agro-forestry extension, environmental education, NTFPs and alternative income-generating activities. This leaves two critical shortcomings:

- Technical knowledge about how to leverage multiple-benefits from agro-forestry systems and how to measure above and below ground carbon sequestration
- Business savvy about how to market and sell quantified reductions in carbon emissions (so-called 'carbon credits').

In order to redress these weaknesses, CARE-Tz has (through PEMA) approached the World Agroforestry Centre (ICRAF) and the Carbon, Community and Biodiversity Alliance (CCBA). Both institutions have offered their assistance. Indeed, ICRAF has already found funding to provide technical support. The CCBA, whose Standards remain the benchmark for rating multiple-benefit LULUCF projects, is no less eager to work with CARE and may be able to find funding to do so. Driven by this confluence of opportunities, CARE-Tz has developed a concept note for funding multiple-benefit LULUCF activities in the Uluguru and South Nguru Mountains (see Appendix 1). Whether this concept note moves forward or not, CARE-Tz is committed to designing and implementing LULUCF activities in the Eastern Arc Mountains.

It is less clear whether or not CARE-Tz should get involved in 'deforestation avoided' projects at this time. The Government of Tanzania is interested in forging ahead, and CARE's involvement could improve the likelihood that projects will benefit rather than harm poor, forest-adjacent communities. Nonetheless, this goal would have to be balanced against inevitable trade-offs and potential political costs.

In sum, the key question may appear to be whether mitigating climate change is in-line with the CO's priorities. It isn't a priority. However, the *right question* is whether activities to mitigate climate change can make an important contribution to the CO's priorities. The answer to this would seem to be equally clear: they can.

Aside from establishing new projects that contribute to mitigating climate change, staff felt steps should be taken to limit the CO's 'carbon footprint' (i.e. reduce emissions generated by *all* CARE projects and operations). More generally, they felt the CO should help employees reduce their personal carbon footprint through a combination of awareness raising and practical information. Furthermore, staff recommended that CARE International investigate the pros and cons of going 'carbon neutral' as a matter of policy.

5.3 Adaptation - Description

The effects of climate change are already being felt by many of the world's poorest communities. Even in the unlikely event that GHG emissions suddenly begin to shrink, feedback within climate systems means *past* emissions will still be taking their toll 1,000 years from now. In other words, climate change is an inevitable part of our future. It is, therefore, crucial that adaptation form a central part of the world's response to climate change.

"Adaptation policies have had far less attention than mitigation, and that is a mistake...we need to think now about policies that prepare for a hotter, drier world, especially in poorer countries."
(Frances Cairncross, Chair of the U.K. Economic and Social Research Council, quoted in Tearfund 2006).

Many efforts have been made to define what is meant by adaptation to climate change. According to Smit et al. (1999; 2000) and the IPCC (2001), adaptation refers to the "adjustment in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts". More specifically, it refers to "processes, practices, or structures to moderate or offset potential damages or to take advantage of opportunities associated with changes in climate" (IPCC, 2001).

CARE's *prima facie* priority lies in reducing the vulnerability of poor communities to current, as well as projected, climate variability and change. Many donors think the way forward is to deploy cutting-edge technology and build big infrastructure. But the experience of NGOs like CARE suggests that investing in disaster risk reduction and adaptive capacity at the local level is far more effective. As a bonus, these activities yield immediate benefits that reach beyond the objective of tackling climate change.

Therefore, development-oriented NGOs are already helping vulnerable communities by:

- Reducing climate-associated risks (i.e. tackling people's *exposure* to hazards)
- Enhancing the adaptive capacity of poor households, their networks and institutions
- Mainstreaming climate change considerations in all assistance programmes

5.3.1 Reducing climate-associated risk

Disaster Risk Reduction (a.k.a. Risk Management) entails the "systematic development and application of policies, strategies and practices to minimise 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" (UN/ISDR 2002).

This pro-active, long-term approach to addressing natural disasters is already advocated by CARE (n.d.), as well as the Red Cross and Crescent (2005), the World Bank (Burton and van Aalst 2004), and DFID (2005). It can strengthen traditional strategies to cope with adverse climate conditions or introduce new ways to deal with unprecedented threats.

Box 8: Climate risk reduction activities

Source: Red Cross and Crescent 2005: 9

Examples of activities that reduce climate risk:

- Building drainage systems
- Reforestation and replanting of mangroves
- Substituting cows for camels
- Adopting new crops and agricultural methods
- Water harvesting, and
- Radio early warning systems

5.3.2 Strengthening adaptive capacity

According to the IPCC (McCarthy *et al.* 2001), vulnerability to climate change is determined by *exposure*, *sensitivity* and *adaptive capacity* – each of which is, in turn, heavily influenced by economic, cultural and political factors. Thus, the poorest people are often more exposed to climate hazards, more sensitive to their impacts and least equipped to deal with their consequences. The human disaster in New Orleans that followed Hurricane Katrina is illustrative: poorer communities often occupied the most flood-prone areas (they were most *exposed*), had the least robust housing (making them more *sensitive* to hurricane damage), and lacked access to resources and supporting institutions that might have helped them avoid the worst impacts of the hurricane (e.g. access to early warning systems, capacity to evacuate their properties quickly and resources to find alternative accommodation). Indeed, many people who couldn't afford insurance stayed home to protect their property from looters despite the risk this posed to their lives. Loss of assets subsequently reduced their ability to recover and adapt after the event, putting them at greater risk of future disasters.

CARE and other NGOs can enhance poor people's adaptive capacity by helping build their assets (e.g. human, social, political, natural, financial, and physical capital) whilst breaking down the barriers they face to effective action (e.g. poor governance and discrimination).

'Coping' is about dealing with relatively short-term conditions, like a drought. In contrast, 'adaptation' is about adjusting to long-term situations, such as a fundamental change in drought frequency. 'Adaptive capacity' refers to the ability of poor households, their networks and institutions to manage the effects of such change (Tschakert 2006).

5.3.3 Mainstreaming climate change considerations

As an underlying cause of poverty, climate change has dramatic implications for the direct costs and feasibility of achieving the Millennium Development Goals that underscore CARE's programming.⁹ Thus, some NGOs are integrating:

policies and measures that address climate change into development planning and ongoing sectoral decision-making, so as to ensure the long-term sustainability of investments as well as to reduce the sensitivity of development activities to both today's and tomorrow's climate' (Eriksen et al., forthcoming).

In other words, these institutions are 'mainstreaming' climate change considerations throughout their programmes by:

- Climate proofing development and emergency relief activities
- Responding to emergent threats and opportunities triggered by climate change

Climate proofing. 'Climate proofing' is about acting with both climate change realities and projections in mind. For example, Water Aid expects key aquifers in Tanzania and Ethiopia to dry up or subside as a result of the slower recharge rates associated with climate change. In response, deep boreholes are being considered even where shallower – and substantially less expensive – wells might currently suffice (de Waal 2005).

In the context of emergency relief and rehabilitation, the principle of climate proofing is commonly called 'intelligent recovery.' It may justify helping people move out of flood-prone areas. It should also shape less dramatic, but similarly important, decisions. The 1999/2000 Mozambique floods illustrate the danger of foregoing due

⁹ For more information on how climate change will affect achievement of the MDGs, see Reid and Alam 2005

consideration of climate change. Indeed, the hybrid seeds handed out to survivors were ill-suited to the country's increasingly chaotic, but generally drying, climate. The intolerant plants withered and died during the next year's drought; and this added to the suffering of communities that intervention was intended to assist.

More and more donors are demanding that development projects and emergency relief operations pass the litmus test of climate proofing.

Responding to challenges and opportunities. Climate change will reshape the constellation of challenges and opportunities we currently face to achieving the Millennium Development Goals. Water and sanitation, health, livelihoods, social equity, food security, conflict and displacement will be especially affected. Indeed, each of these sectors will need to carefully recalibrate what it does and how in light of climate change impacts (e.g. diminishing water supplies, expanding disease vectors and/or ecological fragility). In addition, CARE Members and Country Offices will have to reassess where the need for assistance is greatest and what needs to be done.

5.4 Adaptation - Assessment

CARE-Tz staff perceive climate change as an 'underlying cause of poverty' and recommend that their Country Office:

- o Incorporate climate change into the next phase of its LRSP
- o Help communities adapt their livelihoods to climate change through improved management of their natural resource base. This should be a short-term priority.
- o Integrate climate change into all current and future activities so that intervention outcomes are more resilient and make a *lasting* contribution to reducing poverty. This implies that taking climate change into account should become a fundamental part of the project design process. One way to do this may be through better understanding and use of climate change scenarios. Whilst such 'mainstreaming' should be a medium-term goal, it should begin as soon as possible. Gains in practical experience could be 'fast-tracked' by incorporating climate change considerations into two or three current projects.

Reducing climate-associated risk: Droughts and floods are widespread in Tanzania. Their intensity and frequency are both increasing whilst, in many parts of the country, people's traditional coping mechanisms are being eroded. This is particularly true of pastoralists and farmers in semi-arid parts of the country (Government of Tanzania, 2003). The areas likely to be most hard-hit by a net decrease in rainfall are Tabora, Dodoma, Rukwa and southern Mbeya Regions. Meanwhile, climate variability is likely to increase throughout the north-east and coastal regions. Kilimanjaro may be one of the hardest hit of all despite traditionally receiving heavy *vuli* rains (NAPA, forthcoming).

These especially vulnerable people may merit special consideration and Disaster Risk Reduction/Management assistance, despite the fact that CO staff did not mention this objective in their Poverty-Climate Change Workshop. Such activities would harmonise with CI's growing commitment to:

design, implement, monitor, and influence development, relief and rehabilitation programmes and interventions in ways that avoid or limit the adverse impacts of hazards and minimize related disasters; as well as ensure effective response to the impact of hazards (CARE n.d.).

Neither Government's draft NAPA or Disaster Management Plan consider community-based DRR/M. Thus, there is a clear niche for CARE in demonstrating the viability and value of an approach that builds from the grass roots up.

Strengthening adaptive capacity: Different social groups have different adaptive capacity, and any activity (from income generation to health, to education) that redresses inequity is a step in the right direction. Nonetheless, targeted interventions will make the biggest ‘bang for the buck.’ In the context of Tanzania, the greatest immediate need may be to help people adapt their livelihoods to changing climatic and ecological conditions. Appropriate activities could entail:

- Agricultural extension services providing women farmers with information (i.e. enhancing human capital) about drought-resistant crop varieties
- Community-based resuscitation of dipping services (i.e. enhancing physical capital) for pastoralist facing a plague of livestock pest populations.

Whilst such activities would *build* critical capital in vulnerable communities, complementary activities might *seek to preserve* that which they already have but are at risk of losing. Thus, complementary activities could include:

- Promoting, through testing and demonstration, ‘indigenous knowledge’ about coping with climate variability
- Providing advocacy training and/or legal support to poor communities threatened with exclusion from productive lands.

As illustrated in the case below, the way in which people cope with climate variability can be re-active and detrimental to their long-term interests.

Box 9: How re-active adaptation to climate change can increase vulnerability

Source: Comment of a participant at the CARE-Tz Poverty-Climate Change Workshop

“Experience from CARE food security projects in Mwanza shows that in response to recurrent unfavourable rain seasons, herdsman communities are forced to sell part of their herds as a coping mechanism. The effect is felt at the household level, in the form of reduced nutritional intake among household members. In some other communities, men are selling charcoal and women are forced to sell firewood. It is valid to say that local communities need help to adapt to climate change, as these coping strategies may lead them to become more vulnerable not only to changes in the natural resource base, but to food and nutritional insecurity as well as Mbehombeho hamlet).”

CARE-Tz has a great deal of experience implementing the kinds of activities that strengthen the adaptive capacity, and improve the strategic choices, of poor communities. Yet, the concept of ‘adaptation programming’ is new. Therefore, it is likely that getting the best results would require substantial technical support – especially in the design phase – and demand a steep learning curve. The challenge would be particularly pronounced if CARE-Tz chooses to work with the most vulnerable communities in semi-arid zones.

One of the biggest questions regarding adaptation to climate change is how the scale of intervention that circumstances require can be financed. It may be possible for CARE-Tz to explore the ways in which, and the extent to which, carbon markets (through LULUCF activities) offer a solution.

CARE-Tz staff recognise the value of mainstreaming climate change considerations into planning by different sectors. Unfortunately, they have few examples in Tanzania or abroad to guide their efforts. Indeed, the CO would largely be breaking new ground if it were to ‘build climate change scenarios into future development/project planning to improve the resilience of outcomes and contribute to long-term poverty reduction’ as staff propose. Accordingly, their recommendation to start by integrating climate change considerations into several current projects seems like a wise way forward.

5.5 Advocacy - Description

In the past, CARE’s programming focused narrowly on effecting change at the grass roots. Yet, the causes of poverty and injustice frequently stem from decisions by national legislatures, international organizations, and other powerful institutions. ‘Advocacy’ is about engaging and changing these actors whose beliefs, attitudes and behaviour profoundly impact so many peoples’ lives.

Over time, CARE has come to define advocacy as “the deliberate process of influencing those who make policy decisions” (CARE Policy and Advocacy Unit n.d.: 1). Its objective may be to change bad policies or promote new ones. Regardless, CARE’s advocacy work is always:

- Grounded in field experience
- Rooted in a rights-based perspective

A solid grounding in field experience ensures that CARE’s agenda for change reflects real-life priorities: both those of especially vulnerable social groups and institutions trying to help them more effectively. CARE’s operational nature also gives it credibility and opportunities to monitor the implementation of policies.

CARE’s rights-based perspective is similarly significant. It drives CARE to work directly with poor communities in identifying chronic, systematic violations of their rights, analysing sources and causes, and developing appropriate responses. In so doing, it lends CARE’s voice special legitimacy and its positions special force in policy arenas.

Advocacy is the DELIBERATE process of influencing those who make policy decisions.

Advocacy is action aimed at CHANGING the policies, position and programs of governments, and others...

Advocacy is an organized, systematic, influencing process on matters of PUBLIC INTEREST.

Good advocacy is often a matter of putting a problem on the agenda, providing a solution to that problem, and BUILDING SUPPORT FOR ACTION on the problem and solution.

Good advocacy is a SOCIAL CHANGE PROCESS affecting attitudes, social relationship and power relations, which strengthens civil society and opens up democratic spaces.

5.6 Advocacy - Assessment

In light of CARE-Tz’s operational nature, staff believe the CO is particularly well suited to:

- Help the Government of Tanzania and its development partners understand that climate change is already occurring and impoverishing people
- Raise the profile of climate change in development debates and encourage the mainstreaming of climate change in public policies (especially MKUKUTA).

Staff argued that CI should also advocate for the rights of vulnerable communities so that multi-lateral policy frameworks for climate change incorporate their interests.

CARE-Tz’s Long Range Strategic Plan (LRSP) prioritises participatory policymaking and emphasises the role of rights-based/people-centred public policy advocacy. At the heart of this strategy lies recognition that ‘projects’ alone cannot overcome poverty. Greater democracy, transparency and the work of civil society to hold decision makers accountable are more likely to achieve long-term sustainable changes for poor people.

This thinking is expressed in CARE-Tz’s decision to invest, both at project and Country Office levels, in its capacity to advocate for pro-poor public policies. These

investments are being reinforced by those of the Regional Management Unit which has recently hired an East and Central Africa Advocacy Coordinator.

As document in section four of this report, there is a great deal of work to be done. Indeed, the Government of Tanzania is slowly moving ahead to honour its obligations under the UNFCCC. An important milestone will be reached later this year with the finalisation of its National Adaptation Programme of Action. Nonetheless, there are significant weaknesses within this document and the insular process through which it is being created. For instance, the NAPA does not consider gender in its analysis or conclusions. Women are mentioned only once (with regards to their higher rate of infection by malaria), as are pastoralists despite the fact that these two social groups are especially vulnerable to climate change. Meanwhile, due consideration of climate change realities is completely missing from other key government documents, including MKUKUTA and the National Disaster Management Policy.

These glaring faults, and the fact that other civil society organisations are not already putting a spotlight on them, suggests CARE could make an important contribution in Tanzania by:

- Challenging government to systematically address the *relative vulnerability* of different social groups in its official response to climate change
- Assisting government to *mainstream* climate change in its thinking about poverty reduction and disaster management

CO staff concluded this would require getting involved in the NAPA process, ideally in collaboration with other civil society organisations and affected communities.

With regards to disasters, there is scope for CARE-Tz to:

- Influence how relief is allocated and delivered, persuading other actors to address *root causes* of food and other emergencies
- Advocate for government, donors, and multilateral organizations to develop standards of *intelligent recovery* that could reduce the impact of similar events in the future.

As such, advocacy could play a strategic role in supporting and scaling-up mitigation and/or adaptation activities undertaken by CARE-Tz.

8. Conclusions

Because of the limited resources they have at their disposal, and because of the formidable barriers to effective action they face, Tanzanians are amongst the most vulnerable people to climate change in the world. This is particularly true of people living in drought and flood prone areas. Though it is difficult to ascribe any specific event to global warming, people in those communities with which CARE-Tz is working frequently claim their climate is changing in unprecedented ways. Staff have corroborated these conclusions and noted in the Poverty-Climate Change Workshop how:

- Late rains in Dodoma (Kibaigwa) have led to an increase in pests, especially army worms
- The number of malaria cases has risen in the Pare Mountains as a result of higher temperatures and in Changa village due to more rainfall

Staff draw strong linkages between climate change, CARE's mission and its activities – especially with regards to health, education, natural resource management, entrepreneur development and gender. As a result, they agreed the CO should mainstream climate change considerations into all programming so as to maximise the sustainability of development outcomes *and* ensure continuing support from donors. In addition, staff felt climate change should inform the CO's LRSP – including decisions about where CARE works and the types of projects it prioritises.

Staff believe that CARE should begin to position itself strategically on the issue of climate change and, eventually, undertake mitigation, adaptation and advocacy activities. In order to do so, there needs to be a process of awareness raising and capacity building at all levels within the CO. Formats for internal awareness-raising include: programme meetings, project staff meetings and the senior programme staff retreat. This should be complemented by awareness-raising amongst partners, communities and policymakers (e.g. the education sector could incorporate environmental/climate change awareness in its education programme).

Although CARE in general, and CARE-Tz in particular, already have many of the skills, experiences and relationships necessary to address climate change, the way forward is not without substantial challenges. In order to support the Country Office in its efforts, staff suggest:

- CI should develop guidelines stipulating how climate change can be factored into the design, implementation and monitoring of *future* programmes
- CI should develop a methodology for assessing the extent to which *current* programmes are affected by/effect climate change and how they can be adapted to be both climate proof and climate friendly

The CO's capacity to utilise these and other tools will require ongoing technical support – especially when first introduced. At both national and international levels, CARE should participate in and/or establish networks with other development-oriented NGOs to share practical experience and refine its ways of working. If it does so, CARE will be at the forefront of those institutions who understand – in the words of the U.K.'s Foreign Secretary, Ms. Margaret Beckett – that “Dealing with climate change is an imperative for today, not an option for tomorrow” (Beckett 2006).

9. Appendices

Appendix 1

Multiple-benefit Carbon Sequestration in the Eastern Arc Mountains

Region/country: South Nguru and Uluguru Mountains. Tanzania, East Africa

Contact person: Dr. Balaram Thapa, Program Director, CARE International in Tanzania

CARE International in Tanzania is working to protect and, where necessary, restore those forest and other natural resources critical to realising the sustainable development goals of stakeholders in the South Nguru and Uluguru Mountains. These unique mountain blocks are amongst the world's most important "hotspots" for biological diversity. They are also home to some of the poorest people in one of the world's poorest countries.

Multiple-benefit carbon sequestration and reduced emissions payments for environmental services (PES) each play an important part in the integrated approach to poverty reduction, ecosystem conservation and climate change mitigation being developed by CARE and its partners. This approach, which CARE hopes to pilot and promote through demonstration, consists of the following core components:

1. **Carbon sequestration:** Using the *plan vivo* model, CARE and its partners aim to sequester at least 100,000 tonnes of CO₂ (approximately 70 tonnes per hectare x 1,500 hectares) in the South Nguru and Uluguru Mountains. With technical support provided by the World Agro-forestry Centre (ICRAF), plantings will prioritise local species incorporated into the farming systems of small landholders. Additional plantings may take place on communal land – or degraded land belonging to central government – as a means to fund village development. In order to ensure the buyers of Voluntary Emissions Credits (VECs) that multiple benefits will be realised, CARE will meet or exceed design and implementation standards set by the Carbon, Community and Biodiversity Alliance (CCBA).
2. **Reduced emissions:** CARE and its partners will pilot the use of PES to finance and help motivate the wide-scale adoption of fuel-efficient, reduced emissions cooking stoves. Work will begin in three communities in the South Nguru Mountains and three communities in the Uluguru Mountains. Previous projects promoting fuel-efficient stoves in this area have found uptake to be very dependent on local conditions and there is no experience of applying PES in this context. Therefore this aspect of the programme will be piloted on a more experimental basis and it is not possible at this stage to make firm projections for carbon sequestered.
3. **Leveraging payments for environmental services:** Drawing on its substantial experience in micro-enterprise support, CARE will help households improve their livelihoods by strategically *investing* PES income. This will help families reduce their vulnerability to poverty through the creation of more diverse and profitable income-streams.

All three of these activities will be implemented within the context of the Participatory Environmental Management (PEMA) Program and Uluguru Mountains Management and Conservation Project (UMEMCP). Both of these integrated natural resource management (iNRM) projects have been running for more than two years. During this time, they have gathered a wealth of base-line socio-economic and bio-physical data, established strong working relations with local authorities, and provided substantial training and institutional support to community-based organisations. This existing presence will accelerate the implementation of activities and reduce transaction costs.

It is assumed that the carbon sequestered through this project will be purchased at the prevailing rates within the voluntary market. Over and above the cost of purchase of sequestered carbon there will be a need for investment in a start-up project which will design the financing mechanisms, establish effective monitoring capability and support necessary transaction costs such as training of community members and the coordination and technical support to be provided by CARE. The cost of this start-up project is estimated at US\$ 1.6 million over a 4-5 year period. Depending on the exact arrangement for purchase of carbon credits an additional US\$ 50-90,000 will be needed for continued support, including monitoring and evaluation, for each subsequent year spanning the duration of committed carbon/emissions credits.

Appendix 2

Analysis of country programme and staff recommendations

As part of the Poverty-Climate Change Initiative, sector representatives at the Tanzania Country Office were invited to a *Poverty-Climate Change Workshop* (on 10th July 2006), where an introduction was given to climate change and its linkages to poverty and CARE-Tz activities. Participants were invited to give their reactions and propose how they would like to see CARE respond to climate change. Their responses are summarized below.

Overview

- Participants were strongly struck by the linkages between climate change, CARE's mission and its activities
- Climate change was seen to be relevant to all CARE sectors (including health, education, natural resources, entrepreneur development, gender, etc.)
- It was agreed that at a strategic level, CARE should take on board climate change both to improve the sustainability of development activities and to maintain funding from donors in the medium to long-term (given that climate-proof projects are likely to be demanded in future)
- There was considerable support for mainstreaming climate change into CARE programming, in terms of mitigation, adaptation and advocacy
- CARE employees confirmed that their experience from the field reinforced the fact that the poor are already experiencing the impacts of climate change, even though they may be unaware of the concept of 'climate change' or its global causes (see Box 1).
- Similarly, some participants felt CARE was already carrying out activities in ongoing projects related to climate change without referring to 'climate change' as such.

Awareness-raising and capacity building within CARE-Tz

- CARE should begin a process to position itself strategically on the issue of climate change and build capacity via an internal learning process
- It is important to create awareness at all levels (from top to bottom), and in all CARE sectors
- Formats for awareness-raising internally include: Programme meetings, project staff meetings and the Senior Programme staff retreat
- CARE should not only raise awareness internally, but also externally, among partners, communities and policymakers (e.g. education sector could incorporate environmental/climate change awareness in its education programme)

Resources

- Useful to develop basic guidelines for designing programmes that take climate change into account
- Investigate the possibility of conducting 'climate impact' assessments to establish the extent to which current activities or future projects are contributing to CC and to help make them 'climate proof'
- Improve understanding of how climate change can be integrated into *ongoing* projects
- Helpful to have a representative at CARE to guide the learning process and provide support on the issue of climate change
- CARE should be active in establishing networks to promote the exchange of ideas (within CARE and between CARE and similar organizations)

Mitigation

- Support for CARE involvement in 'multiple benefit' mitigation projects, e.g. promoting bio-diesel (e.g. E3 recently expressed an interest in cooperation on a *jatropha* biodiesel project)
- Support for reducing emissions in CARE projects and operations
- Important to help employees to understand the consequences of their actions by suggesting practical steps to avoid contributing to climate change (e.g. turning off lights, avoiding leaving electrical equipment on standby, etc.)
- Investigate feasibility of CARE International becoming carbon neutral (support given for the principle)

Adaptation

- Understanding how other NGOs are tackling climate change can be a useful way of informing CARE's response. In terms of disaster risk management, participants found it useful to learn about what other development NGOs were doing (e.g. Water Aid, Christian Aid, Red Cross/Crescent).
- Support was voiced for building climate scenario predictions into future development planning (e.g. Water Aid digging deeper boreholes) to improve resilience to climate change and contribute towards long-term poverty reduction
- Importance of helping local communities adapt to climate change and manage natural resources in a sustainable way was emphasized – i.e. reducing vulnerability to future climate change. The example of farmers in Morogoro (Paavola 2003) from the presentation was cited, whose coping strategies in response to current climate variability have led to a degraded natural resource base, which may in turn make them more vulnerable to climate change in the future. Also see Box 2.
- It was suggested that CARE Tanzania explore the possibility of building climate change into two or three ongoing projects to make a start and build experience on the ground.

Internal response: mainstreaming climate change in CARE programming

- Mainstreaming climate change into CARE programming should be a medium-term goal, but the mainstreaming process should begin as soon as possible
- Climate change is a cross-cutting theme, which should be integrated into all current and future activities
- It was suggested that making climate change an integral part of the project design process should become internal policy
- Given that climate change represents an underlying cause of poverty, it should be incorporated into the next phase of the LRSP

Advocacy and networking

- Participants see an advocacy role for CARE on the issue of climate change
- At the national level, CARE should at the very least:
 - Urge the government to raise the profile of climate change in the public agenda and apply pressure for mainstreaming in public policy
 - Press for links between climate change and poverty reduction strategies – e.g. it was pointed out that MKUKUTA (National Strategy for Growth and Reduction of Poverty) pays little attention to environmental linkages. Climate change should be incorporated into national poverty reduction strategies.
- CARE could get involved in the NAPA process which has, so far, been very top-down
- CARE is in a position to communicate to policymakers that poor people are *already* experiencing the impacts of climate change
- The role of networks relating to climate change was emphasised – within CARE, and between CARE and partners and communities
- Lobbying at the international level is thought to be best-achieved by CARE through networks

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