



Photo Credits:
Crispin Hughes
John Magrath
Simon Nangiro
Geoff Sayer



1. INTRODUCTION

People in developing countries like Uganda, whose contribution to global warming has been miniscule, are feeling the impacts of climate change first and worst.

Climatic changes are happening in Uganda. On the one hand there is more erratic rainfall in the March to June rainy season, bringing drought and reductions in crop yields and plant varieties; on the other hand the rainfall, especially in the later rains towards the end of the year, is reported as coming in more intense and destructive downpours, bringing floods, landslides and soil erosion.

This report examines the impacts of climate changes on agriculture, on pastoralism and on health and water. Climate shocks undermine health and well-being, the economy and the overall development of the country. Food insecurity in Uganda is a major challenge and climate shocks are making food insecurity worse. Impacts are greatest on the lives of ordinary people, and especially women, frustrating their efforts to overcome poverty.

Such things are happening when global average temperatures have not even exceeded a 1 degree centigrade rise above pre-industrial levels. As temperatures rise further, risks will be magnified.

The government of Uganda is planning how the country can adapt to climate change, and how these measures can be aligned to poverty reduction strategies. For a start, Uganda is beginning to look for nearly \$US 40 million to implement immediate and urgent adaptation measures (it's National Adaptation Programmes of Action, or NAPA). It is currently uncertain how much it will get from the international community. Yet this is in the context that, for example, a 2 degrees temperature rise would probably wipe out most of Uganda's coffee

production, upon which some five million people rely directly or indirectly, and which earns the country several hundred million dollars a year.

Global equity demands that a country like Uganda must be able to develop, and use fossil fuels in the interests of national development and poverty reduction. At the same time, Uganda has opportunities, and must get the help it needs, to move to a cleaner and less polluting development path that does not depend on fossil fuels and that avoids the spiralling costs – both to the economy and the climate - that increasingly go with that dependency.

Climate change does not happen in isolation. It interacts with existing problems and challenges – notably deforestation, soil degradation, declining food security, declining fish stocks – and makes them worse. Adaptation has to start with adaptation to the current climate. The people of Uganda are highly susceptible to present climatic variations and shocks. Building resilience to how the climate is currently changing is vital both in its own right and as a way to build resilience to whatever climatic changes the future has in store. The right strategies to adapt to climate change will also be the right strategies for truly sustainable development, and to reduce poverty, if properly implemented.

It is our hope that this report will raise awareness of the impacts of climate change among Ugandan society, and through building constructive dialogue, contribute to improving and strengthening the NAPA and other national adaptation strategies. We hope that it will strengthen Uganda's case that the costs of adaptation, starting with the most immediate and urgent tasks identified in the NAPA, be financed as quickly as possible and in full.

2. CLIMATE CHANGE AND POVERTY IMPACTS IN UGANDA.

North Uganda and Teso: Primary hazards: conflict, ethnic violence, cattle rustling, drought, and floods. 2007 floods from July to November followed heaviest rain for 35 years. Hundreds of thousands of people affected, crops destroyed, increase in water-borne diseases. Cultivation of swamps mean soils are less able to absorb water.

Rwenzori regions: Primary hazards: Landslides, floods, and refugee influx. In highlands, loss of fertile soil increasing land pressures. Reduced rainy season hitting yields of basic food crops like beans. Mountain icecaps receded by 40% of 1955 cover. May ultimately reduce year-round water flows in Semliki River.

Karamoja regions: Primary hazards: Drought, conflict, ethnic violence, and cattle rustling. Seven droughts between 1991-2000 increase food insecurity, animal losses. Increased conflict over water. Tick-borne diseases increase, tsetse belt expands, dust storms increase chest and eye infections.

Elgon region: Primary hazards: Landslides, floods, and refugee influx. Increased deforestation as farmers forced to higher levels. Species loss. May be one of the few areas still able to grow coffee if temperatures rise two degrees, likely to reduce coffee growing areas to one-tenth of their former size.

South-West: Fastest warming region, 0.3 degrees C per decade with more frequent, severe drought. Becoming unsuitable for coffee. Dairy cattle yields fall due to heat stress. Malaria is at epidemic proportions. Mbarara – 135% increase in malaria cases.

Kampala: More intense rain, inadequate waste disposal, drainage

problems and encroachment on wetlands increase risk of floods, urban disruption, diarrhoea and dysentery.

Lake Victoria: Hotter temperatures likely to lead to lower outflows, hitting hydropower generation. Drought, loss of lakeside tree cover and over-extraction have affected the rainfall cycle and reduced lake levels to lowest for 60 years.



3. CLIMATE CHANGE IN UGANDA: PRESENT AND FUTURE

Across much of Uganda the climate is bimodal, with two rainy seasons, the long rains starting in March and lasting through until June and the short rains running from around October/November until December/January. Generally, these two seasons have been relatively stable and predictable, to the benefit of agriculture. The relative importance of the two seasons for crops varies around the country. Towards the north the climate becomes drier until in Karamoja in the northeast what little rain there is can come any time between March and September, with the most chance of rain falling in April. Rainfall in the arid and semi-arid areas has always been unpredictable and has varied considerably over space and time, with occasional particularly severe droughts.

According to the climate analysis in the Ugandan Government's National Adaptation Programmes of Action (NAPA), published in December 2007, the wetter areas of Uganda, around the Lake Victoria basin and in the east and northwest, are tending to become wetter. Government meteorologists state that the droughts that periodically affect the western, northern and northeastern districts are becoming more frequent. They logged seven droughts between 1991 and 2000, with a particularly long and severe drought in 1999/2000. However, the main influences on agriculture and animal health are less to do with the total amount of rain, than with the distribution of rain through the season, and the type of rain. In this respect, meteorologists and farmers report the same phenomena: in most districts, recent years have witnessed increasingly erratic onset and cessation of the rainfall seasons, and when the rain comes it is heavier and more violent.

Farmers and pastoralists describe these changes as "shortening" the rainy season, saying there is less rain and more drought; as one farmer graphically put it: "*Less rain means less food*". However, some caution is needed



in interpreting these statements. The seasons are not actually shortening, but rather, becoming more unreliable. So far, there is little or no firm scientific evidence of less rain in total; rather, the rain is less useful because of its distribution and impact. Rains may come early then stop for long periods; rains may come when it is supposed to be dry. People describe living through long periods of hot, dry weather when it should be raining steadily, punctuated by violent downpours that may be accompanied by very strong winds, thunder, lightning and destructive hailstorms. The crucial effect, then, is that the growing season for crops is shortened.

According to a study of impacts on tea and coffee producers by the fair trade organisation Cafédirect and German Technical Co-operation (GTZ), Uganda received a total amount of rainfall of 1410.2 mm in 2001 and 1373.8 mm in 2006. The difference is small. However, in 2001 the rain fell over 136 days with an average of 10.36 mm per day; in 2006 it fell in 98 days with an average of 14 mm per day.



Storm over Rwenzori mountains

3. CLIMATE CHANGE IN UGANDA – PRESENT AND FUTURE

In the future drought may well occur even as the climate becomes wetter. “Drought” happens when water is not available in sufficient quantities, which is a function of the ability of ecosystems and human societies to store water over periods of time. Over and over again, people interviewed for this report described how springs and streams that used to flow constantly all year round are drying up. Drought can be triggered by lack of rainfall, as can floods by excessive rain, but the underlying causes are likely to be more to do with such things as deforestation and the extraction of water or the draining of wetlands – all reducing the ability of the land to hold water. More evaporation (as temperatures increase) may also offset more abundant precipitation.

Minimum temperatures have been rising faster than maximum temperatures. They rose from about 1960 to 1982, then declined, then rose again since the 1990s. The trend has been steadily upward to about 1 degree centigrade higher.

Can the present alterations to Uganda’s climate, reported by so many people, be attributed to “climate change” as that term is now generally used – that is, changes in climate from global warming which is due specifically to human actions causing excessive emissions of greenhouse gases, notably carbon dioxide from fossil fuel use?

Some changes are certainly consistent with scientific predictions of global warming effects, notably increasing temperatures, more intense rain and storms and also more erratic rainfall patterns. However, scientists are not currently able to attribute these and other climatic

alterations to man-made climate change; African climates have always shown considerable variability and the influences on climates in Africa are multiple, highly complex and relatively poorly understood, not least because monitoring data is poor – Uganda for example has only a third to a half of the number of operational climate monitoring stations of various types that it needs.

What is certain, however, is that the majority of the people of Uganda are extremely vulnerable to climatic shocks, whatever the cause, as this report shows. They must be empowered to adapt to today’s climatic variability, or else they will certainly not be able to cope with the greater extremes that global warming is bringing about. This will also bring enormous immediate benefits in terms of well-being and poverty reduction.

What does the future hold? For East Africa almost all the models of future climates that scientists have developed are in broad agreement; the region is almost certain to become wetter.[†] This may be thought to be good news. However, as discussed above, there can be more rain and yet also more drought; what matters for farmers is the effectiveness, timing and distribution of rain throughout the crucial growing seasons. Furthermore, if rainfall follows current patterns, it will come in heavier bursts. This type of rain may not only be less useful, it may be positively damaging, smashing crops and washing away topsoil.

Drawing from climate models as used by the Inter-Governmental Panel on Climate Change (IPCC) and other reports it seems that for Uganda:

[†] Climate change computer models work on the basis of trying to simulate the past and current climate, taking into account all the various causal factors including the man-made greenhouse gas emissions that are increasingly influencing the climate. Those that best do this allow one a degree of trust that they will be able to model the future climate with some accuracy, depending on the amount of greenhouse gases factored into each scenario.

3. CLIMATE CHANGE IN UGANDA – PRESENT AND FUTURE

- Future climate change will likely have the biggest impact on the later, short rains. During October to December there will likely be a big increase in the frequency of heavy rainfall, with the number of significantly wetter years rising considerably as a result; indeed, as many as one year in five may well be much wetter than is currently the norm. Indeed, a wetter climate is likely for the whole country, including the arid and semi-arid regions. Farmers believe rainfall is already becoming more intense, and the particularly heavy rains of late 2007 across northern and central Uganda may be a foretaste of this future climate regime.
- For the long rains from March to June the modelled effects of human-induced climate change seem much weaker and less predictable. So warming may not alter the current pattern, which is of more erratic rainfall effectively making the growing period shorter. Future generations may therefore see a switch away from Uganda's current pattern

of two rainy seasons across much of the country towards a new pattern, of a much more pronounced rainy season (with heavier rains) later in the year, with the rest of the year hotter and drier than at present.

- If Uganda becomes wetter, so floods will become more likely, a product not only of higher rainfall and run-off but also of land use changes such as the draining of swamps, and in cities, blocked drains.
- Rainfall changes may begin to become noticeable within about 12 years from now but could become particularly big from mid-century.
- Temperatures will increase and this will become particularly noticeable within the next 10 years. All seasons are likely to become warm to extremely warm.
- Microclimates, however, will remain extremely important and will modify this general picture. Climate varies considerably and is influenced by many factors including altitude, topography, proximity to bodies of water and vegetation cover and type.

Uganda's climate is affected in a major way by the La Nina and El Nino phenomena – changing temperatures in the Pacific Ocean – with La Nina years tending to bring significant drying and El Nino years a soaking. Climate change impacts on these major processes are not well enough understood to be able to make any predictions with confidence, although there is some evidence that warming will increase the intensity or frequency of these phenomena. There is currently (2008) a moderate to strong La Nina in operation.

The big question is: what does climate change mean for the health, wealth and well being of the people of Uganda? This report sets out some of their views and experiences.

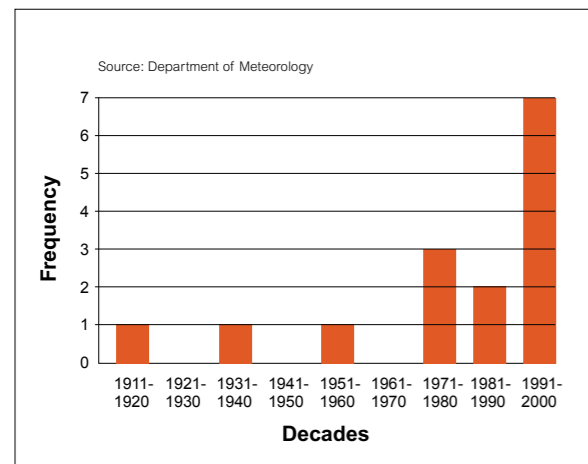


Figure 1: Occurrence of droughts in Uganda

4. CLIMATE CHANGE IMPACTS ON AGRICULTURE



A vegetable roadside stall: climate change threatens yields and varieties of many staple food crops

It is sometimes assumed that there will be winners as well as losers from climate change. If there is more sun or more rain, it is said, then the conditions will suit some crops more, and farmers, being experienced, will switch crops. This is true already to some extent for some farmers in some societies. Britain is hailing the resurrection of a native wine industry as temperatures rise; in Nepal, fruit farmers are growing bigger and tastier apples and other fruit than ever before. And farmers generally are often assumed to be adept at switching their crops from year to year to follow the whims of either the weather or the equally fickle market. As we shall see later in this report, it is possible that Uganda's pastoralists could benefit from a wetter climate.

For Uganda's farmers, however, this seems not to be the case. Baluku Yofesi thinks carefully and strokes his chin before replying: "No, I can't recall any crop that has improved because of climate change. Even heavy rains

have become negative". Baluku is the Executive Director of the Karughe Farmers Partnership in Kasese district of Western Uganda and he charts the changes in climate through the disappearance of local crop varieties. He says:

“Because of the current weather changes the yields have completely gone down”

“We used to have much more rainfall than we are having now, that's one big change, and to me this area is hotter than 20 years ago. Until about 1988 the climate was okay, we had two rainy seasons and they were very reliable. Now the March to June season in particular isn't reliable, which doesn't favour the crops we grow. Rain might stop in April. Because of the shortened rains you have to go for early maturing varieties and now people are trying to

4. CLIMATE CHANGE IMPACTS ON AGRICULTURE

select these. That's why some local varieties of pumpkins and cassava that need a lot of rain, even varieties of beans, have disappeared. We need things that mature in two months - maize needs three months of rain to grow so two months is not enough. Coffee isn't doing badly, but it's not doing well either – not like the 1970s when we harvested lots”.

A similar story is told further north in Bundibugyo district. Mbejuna Lazaro of Bulirehe village has been farming since 1965 and has been reasonably successful – successful enough to be able to hire labour to do much of the work now he is growing old. He enumerates the crops he grows – cocoa and coffee, vanilla, matoke, soya beans, sweet potatoes, cassava, maize and groundnuts – and says he is branching out into bee keeping.

However, when asked what climate changes he has observed, he says *“I must refer your question to my wives”*. In Uganda, as in most of Africa, women are of course the main farmers.

His elder wife Florence Madamu emerges from the kitchen and immediately puts a different perspective on matters. She says:

“The cassava no longer yields anything, there are flies that eat up the leaves. Bananas are attacked by mosaic [a virus]. This area no longer produces beans; we've tried and failed. Sometimes we grow soya beans but they don't do well. The only crop that currently does well is sweet potato; for the cassava there's no hope. Because of the current weather changes the yields have completely gone down. All this is a result of long spells of sunshine – the sun is prolonged until the end of September - and whenever it rains it rains so heavily it destroys all our crops in the fields. You can plant a whole acre or two and come out with nothing”.

How does she adapt her farming methods? She throws her hands up.

“We've stopped even adopting seasonal planting, because it's so useless. Now we just try all the time. We used to plant in March and that'd be it. Now we plant and plant again. We waste a lot of seeds that way, and our time and energy. We regret it so often, why we planted. Then we have to plan to acquire other seeds, and the seeds here are very costly. Sometimes you feel like crying. Sometimes you've hired labour and you end up losing all that money for preparing your land”.

Gender dimensions in Uganda's farming system

- Women constitute the majority of the estimated 70% of smallholder subsistence farmers and contribute 70-75% of agricultural production; an average 55% of labour for land preparation; 65% for planting; 85-90% for weeding.
- Women are responsible for a variety of post-harvest activities ranging from crop preservation to processing and storage. Women are responsible for 60% of harvesting and 90% of preparation and processing.
- Within farming systems, men tend to concentrate on the production of cash crops while women concentrate on the production of food crops (70-80%) mainly for consumption.
- Women own only 7% of the land.

Sources: UNDP, citing PEAP Revision Paper for the Agricultural Sector (2004) and other plans.



Florence Madamu with her husband

Other farmers and District Agricultural Officers interviewed for this report agree; farmers now must take more risks, they must gamble more than they used to, to keep sowing and planting in the hope that rain will come – and stay. If they wait until the rains are certain, they may have left it too late for the crops to grow. And then an increasing hazard is that heavy rains come in what is supposed to be the dry season.

Unfortunately, weather forecasts over the radio are still not local enough or reliable enough to guide them, and they say that traditional ways of forecasting rain – the appearance of certain insects like white ants or glow worms, the appearance of certain clouds or stars – are no longer the reliable guides they claim they once were.

What keeps Florence and her husband going, and many farmers like them on the lower slopes of the Rwenzori Mountains, is cocoa.

Cocoa is a good money-spinner and more and more farmers are switching to it – and switching away from crops that no longer grow well.

Most of the crops that do not do well are said to be traditional food crops, like beans, cassava, maize and matoke. Farmers need an income, but the growing switch to a cash economy in which they must buy their food in the market, instead of growing it themselves, worries some.

For a start, not everyone has easy access to markets that can supply a wide range of goods; farmers in the highlands especially complain that all they can buy is salted fish. For another thing, the market is a fickle creature, and farmers worry that they will become dependent on cocoa growing and then the bottom will fall out of the market. It has happened before – they tell of how they were advised to grow moringa and then vanilla – *“and everyone who grew vanilla would be able to afford an aeroplane!”*

4. CLIMATE CHANGE IMPACTS ON AGRICULTURE

Moringa is a hardy, versatile and highly nutritious crop, but the market has not taken off so far. Vanilla has done much better but prices have been highly volatile; world output fluctuates and Uganda is a new exporter competing with much bigger producers, notably Madagascar, and also with synthetic vanilla. Justas Mutende says:

“Vanilla was supposed to be climate-proof and we introduced jatropha trees for the vanilla to climb up, but jatropha consumes a lot of water and saps fertility so it has become a burden and anyway at the end of the day the vanilla lost its market too”. †

The price a farmer gets for cocoa also varies widely and depends on several factors. Those relatively few farmers signed up to a multinational company and selling organic certified cocoa direct to them might get a good price; most farmers, although their cocoa is also grown without artificial chemicals, are not certified and have little option but to sell to middlemen who come round at harvest time. They may get only a third, or less than a third, of the price of their luckier neighbours. A similar situation applies to vanilla and coffee.

For farmers higher up, their options are even more limited, and climate change is limiting their options further. They are finding it increasingly hard to find land to cultivate. A mosaic of small fields of all shapes covers the foothills of the Rwenzori Mountains, some of them on seemingly precipitous slopes that appear almost impossible to cultivate. A tree is a rare sight.

Maate Jockus, a District Environmental Officer, primarily blames soil erosion for the falling yields. The highland farmers, he says, want to move downhill – *“they are following their own soil down the slopes”* – but there is a land shortage in the lowlands and moving brings land

conflict. He and other officials are advising highland farmers to grow cocoa, although it does less well the higher up you go. He says pressure on resources, and particularly on trees, is exacerbated by outsiders coming in with chainsaws to cut down trees for export.

Ugandan farmers are resourceful, enterprising individuals, willing to experiment with a wide variety of crops and ways of making a living. They are switching to such things as bee keeping, fish farming and brewing and to growing crops like highland rice, garlic, soya beans and Irish potatoes. There is a particular demand for poultry and pigs, especially among women. If their husbands have died, and especially if they themselves are living with HIV, they find that pigs and poultry are less labour intensive.

This is the kind of initiative promoted by the North Rwenzori Rural Community Agriculture and Conservation Link (NORRACOL). The local agency – which is a partner of Oxfam’s – supports model farmers to experiment with a wide variety of crops and livelihoods. It promotes tree planting, agro-forestry, the construction and promotion of fuel-efficient cook stoves and contour bund construction on the slopes to hold water and slow the rate of soil erosion.

Such strategies, and people’s resourcefulness, will be needed as climate change impacts accelerate. But unfortunately, farmers are held back by numerous factors. These include poverty and lack of resources; escalating pressures on land, soils, timber and water; and the inability of government services to meet demand.

Tree planting

Tree planting is going to be a major part of the Ugandan Government’s strategy to combat climate change. With no other fuel sources readily available, some 97% of

† A seemingly contrary observation as *Jatropha* is said to be drought resistant



Tiny plots on steep slopes, deforestation and soil erosion seen in the Rwenzoris



Martina Longom

4. CLIMATE CHANGE IMPACTS ON AGRICULTURE

Uganda's population depend upon biomass – firewood, charcoal and crop residues – to meet their basic daily needs for cooking and heating water. Wood is also needed for such things as house construction, as well as fuel for industries like brick making. Some areas of the country have been particularly badly deforested, including semi-arid regions like Karamoja. The Karimojong build their houses – tukuls – from timber but population increase and no corresponding tree programme means the area has seen an alarming reduction in vegetation cover.

Martina Longom of Jie community near Kotido, expresses her fear that having to go further increases the risk of being assaulted. She says:

“Tree cutting first started close around the villages. As the trees were cut, the land became clear for cultivation and the trees were further and further to the north. Every time, we have to walk further from our villages to collect firewood”.

“If there's no fund to keep the trees alive, you have to cut them down to get the benefit”

All over the country citizens are exhorted to plant trees and there are tree nurseries and protected wood lots. For example, Bishop Jackson Nzerebende, Anglican Bishop of South Rwenzori Diocese, has hit upon a novel strategy: every confirmation candidate must plant at least one tree before the sacrament can be conferred. Last year, he says, they planted more than 30,000 trees in church lands and schools, gardens and roadsides. His Diocese has even established a tree nursery that provides seedlings of different kinds, for fuel wood, edible fruits, shade, windbreaks and timber.

It is unlikely, though, that the country's many tree-planting schemes so far have done much to slow the rate of

deforestation, much less halt it. One answer put forward by Bishop Jackson and by some farmers is compensation for growing trees; they should receive an income over the full course of the tree's lifetime. In Karughe, Baluku Yofesi says:

“By just trying to survive by any means, people are actively destroying the environment, so government has to teach people to care for the environment and environmental laws must be enforced by leaders. But there must be some benefit from that care. So long as there's no direct benefit to anybody, people will not take it seriously. Woodlots are cut down because that's the only time they can get a benefit. If there's no fund to keep the trees alive you have to cut them down to get the benefit. I don't know how it could work but maybe the government could say, if you grow some acreage of certain trees the government will pay you”.



Bishop Jackson in his Diocesan tree nursery

4. CLIMATE CHANGE IMPACTS ON AGRICULTURE

Within the Ugandan Government's NAPA, tree planting takes top priority, as we shall see later in this report. The government, too, is pinning its hopes on obtaining international finance. One issue is how much, if any, of the money needed will come from the international community, and when. Some funds are supposed to be available for the immediate adaptation measures outlined in the NAPA. For longer-term plans there are proposals being put forward by some forest nations for payments for keeping their forests, and carbon markets in which forested countries could be paid for keeping their carbon-sequestering forests. None are without controversy and furthermore, without integrated programmes that boost people's livelihoods from several reinforcing angles, individual measures have less chance of success.

Uganda's energy crisis

Ugandans suffer energy shortages of many sorts. In relation to poverty, women's health and climate change, the biggest crisis facing the country is the basic need for fuel for cooking and water heating, which comes in the form of firewood, charcoal and crop residues. Wood, of course, is also cut for construction. On top of those basic needs, other factors have combined to increase demand recently.

Some households, in urban areas especially, used paraffin for cooking and electricity for lighting. The price of paraffin has shot up as the world price of oil has escalated. At the same time, people need paraffin for lighting because of regular power cuts – in part due to drought that has lowered water levels in Lake Victoria and reduced hydropower output – and the escalating unit price of electricity following on liberalisation of the power sector. Households have faced increased economic difficulties. For cooking, people have turned back to charcoal and firewood.

Charcoal consumption has been increasing at a rate close to that of the urban population at about 6% per annum. Another reason is rising demand for burnt bricks connected to a growing economy and house construction.

Uganda's National Biomass Study in 2003, and recent studies on rising charcoal prices and charcoal sourcing, conclude that at current rates of charcoal consumption, most of Uganda's forests will be lost by 2025. Already, some families are cutting down on cooking because they cannot afford rising charcoal prices.

Paradoxically, trading in biomass energy, especially charcoal, is an economic benefit – it employs 20,000 people at least, and generates Ush 36bn (US\$20m) for the economy each year. For many poor people, charcoal production is a crucial lifeline. Such measurements expose a fundamental inadequacy in orthodox economics; that it measures and even values as productivity what is essentially a running down of assets, and fails to measure the true costs of this destruction that come through soil erosion, flooding and so on.

Ultimately, measures to combat deforestation will involve land management policies and incentives for caring for trees, possibly involving compensation from national and international sources. However, the rate of deforestation could be slowed if Ugandans had more efficient ways of cooking that use less wood. Uganda has recently (2007) established a national Renewable Energy Policy and is setting about promoting such things as improved wood and charcoal stoves. Several non-governmental and community organisations are also promoting them. Such energy efficient stoves have to be culturally acceptable, fit with people's cooking habits, and also be affordable and easily maintained.



Bags of charcoal for sale, a common sight along roadsides

4. CLIMATE CHANGE IMPACTS ON AGRICULTURE

Mugisa Jackson, a Community Resource Person mobilised by NORRACOL, is a proud man: in his village, Bulirehe, he has just installed his 20th energy efficient stove and within a few months he reckons that every one of the 57 households will have one.

The reason people want the stoves is that they use much less wood than the old types. People have even found that they can use banana peelings as fuel. But that is only part of the benefit: the Lorena type stove that Jackson builds has a chimney, and this simple device, unknown in traditional kitchens, vents the smoke out of the house and away from the cook's eyes and lungs. Women say they cough less and their eyes are no longer red and sore.

Climate change and coffee

Coffee thrives in Uganda, and Uganda thrives on coffee. The mildly warm, wet climate means that large areas of the



Mugisa Jackson with his fuel efficient Lorena stove

country are suitable for the crop and coffee has been the linchpin of the country's development strategies so far. Many farmers can get two crops a year, one in each rainy season. Coffee is a major export earner and employs over 500,000 people, most of them smallholders. They in turn support their families so that in all, some five million people depend on coffee, directly or indirectly, for much of their income.

But coffee is a fragile crop and there are signs of trouble because of climatic changes. Too much rain reduces flowering, which reduces production. It hinders farmers' ability to dry the beans properly, so the quality is also reduced. It also increases diseases, pests and mould, which hits both production and quality. At the same time, erratic rain, with periods of drought within either of the rainy seasons, shrivels flowers, aborts fruits and reduces soil fertility. Small-scale farmers produce almost all of Uganda's coffee so the result has been hardship for many.

Willington Wamayeye, Managing Director of Gumutindo Coffee Co-operative, a partner of Cafédirect, says: *"I have lived near Mount Elgon all my life and I have never known the weather to be so unpredictable. Rains now fall heavily for a short period and our dry season is much longer. The coffee plants are badly affected – flowering is stopping. Last year alone we lost about 40% of our production. As a result, people struggle for everything. Food is getting more expensive and key food crops like bananas are being threatened as well. Without work and opportunities young people are being forced to move to the cities"*.

A recent survey by Cafédirect recorded very similar phenomena reported by coffee farmers in Kenya and Tanzania, and also by farmers in Latin America.

Partly as a result of climatic problems Uganda's national production has fallen and the quality has dropped, according to Philip Gitao, director of the Eastern Africa Fine

4. CLIMATE CHANGE IMPACTS ON AGRICULTURE



A young woman harvesting coffee

Coffees Association. However, prices have recovered and have been rising ever since 2002, when they hit an all-time low; so farmers have continued to invest and Uganda's Robusta coffee exports – and export earnings - have continued to increase. This has helped offset losses from climatic problems, although because Uganda exports raw coffee beans, the country only gets a fraction of what it could get if the coffee was processed; and smallholders in turn get only a fraction of that, and like cocoa growers, often have to sell to middlemen for low prices.

The future outlook, however, is bleak: if average global temperatures rise by 2 degrees more – as they are almost certainly going to do – then most of Uganda is likely to cease to be suitable for coffee. According to the UN Environment Programme, only patches of land on the periphery would still be able to grow coffee. This may happen within about 40 years, or perhaps as little as 30.

And it could be even worse. The temperature models do not take precipitation into account, and coffee needs not

4. CLIMATE CHANGE IMPACTS ON AGRICULTURE

only water, but also water at the right time. Henry Ngabirano, Executive Director of Uganda Coffee Development Authority (UCDA), told journalists: *“For instance, south western Uganda used to produce large quantities of coffee but the increased dry spells have nearly made the place totally unsuitable for the crop”*.

In the meantime, coffee farmers are going to have to adapt to rising temperatures – and they are. Adaptation – essentially good husbandry - has been driven both by the stick of climatic stress, and the carrot of rising prices for better quality coffee.

Measures can be taken to reduce heat stress and provide

plants with better growing conditions, and the Gumutindo farmers and others like them across Uganda are taking them. In particular, they are growing more trees around the coffee bushes to provide shade; conserving soil moisture and preventing soil from drying out and cracking by mulching; and conserving and reusing water through measures such as terracing. UCDA has started promoting agro-forestry and has seen very good results in mid-northern areas such as Gulu, according to Edward Lutaakome-Sentamu, Principal Development Officer of the UCDA.

Such adaptation measures are boosting both flagging quality and grower’s income, as they chime with increasing world demand for high-quality, shade-grown, organic coffee.

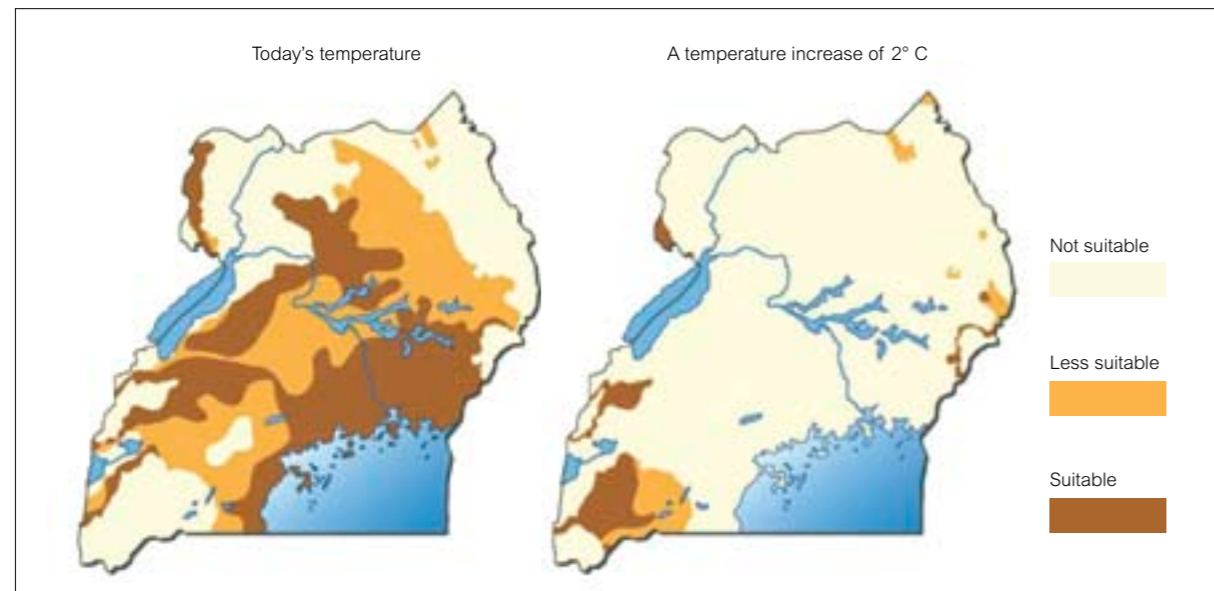


Figure 2: Impact of temperature rise on robusta coffee in Uganda. Source: UNEP/Gridda

5. CLIMATE CHANGE IMPACTS ON PASTORALISM

Pastoralism may be one of the most appropriate and positive forms of livelihood in the face of climate change – and furthermore, climate change may open new opportunities for pastoralists. Pastoralists are adept at living with climatic unpredictability and variability. Uganda is fortunate, therefore, in possessing such a national asset.

Understanding of pastoralism and its interactions with the environment has radically improved over the last couple of decades. Pastoralists move their herds in a purposeful strategy, using their deep knowledge of the land and climate to move between dry lands and wetlands according to the waxing and waning of pasture.

Once seen as a primitive, doomed way of life, it is now clear from many studies that mobile pastoralism in Africa is a highly efficient and economically very productive way of managing dry lands. It is largely when mobile livestock management is constrained that environmental problems result; “sedentarization” – the policy of settling pastoralists, sometimes forcibly – has been particularly identified as leading to overgrazing and subsequent land degradation, and also to poverty.

Even a small increase in annual precipitation will probably benefit pastoralists more than farmers, as mean rainfall will still be low and highly variable. At the same time, rapidly increasing urbanisation in much of Africa is leading to the creation of mega-cities on the one hand and depopulated hinterlands on the other; and partly as a result of urbanisation, a demand for animal products is rising faster than that for other food products. If pastoralists can meet an increasing part of this demand for livestock products, pastoral incomes and welfare will increase rapidly. However, much will depend on pastoralists being able to assert their land rights and maintain their mobility; otherwise more rain in the semi-arid districts could tempt farmers to encroach and take land.

Pastoralists in semi-arid Karamoja – the Karimojong people - have had centuries of experience of dealing with regular droughts, but they complain that their movements are increasingly restricted, and that the government does not provide them with appropriate essential services. Although they speak of the droughts becoming more frequent and intense, it is political and economic constraints that make it both harder for them to cope and harder for them to recover after each drought.

In the community of Jie near Kotido, Martina Longom is looking after her three children and her animals and farming her ‘garden’. In March the land is parched; her husband and the other men have taken most of the cattle away with them far to the West where they know the places where there is likely to still be good pasture. She talked to Oxfam filmmakers looking at the impact of climate change on women’s lives as part of the Oxfam project “Sisters on the Planet”. She said:

“In the past there was enough rain. Whenever it rained the fields would yield all kinds of fruit and our mothers would store lots of food in our granaries. We used to have plenty of boiled sorghum and porridge to eat and plenty of milk to drink. But now things are different. Cows are dying. The rains have disappeared. And when it rains these days, it just drizzles. The drizzle does not enable the sorghum to grow properly. The climate is unpredictable now. And when it does rain, it can be destructive; it sometimes causes bad floods, which then destroy our crops, just like last year. The drinking water that we used to fetch from the riverbeds can no longer be found. The riverbeds have dried up as well. Only hard rock is found beneath them. There is a lot of thirst; even the few livestock we own have so little water. I lament, ‘what can I do to address this thirst?’. Even if you have food to cook, you still need water to do the cooking. What can I do? There aren’t enough words to express the pain”.



Lokomori village: taking cattle out to graze. In October, when the dry season is taking hold, most livestock have been taken by the younger men to mobile 'kraals' in western Karamoja to exploit better grazing.

5. CLIMATE CHANGE IMPACTS ON PASTORALISM

She is speaking of the Karimojong strategy to dig into the sand of the riverbed to find water that has seeped down, but even this has dried up. Fortunately there is a community borehole that yields water that sustains them, but when the cattle come back she says they have great problems as the borehole becomes over-crowded with cattle and people. In other places, the water tables have dropped and boreholes no longer give water. She adds:

“I have seen for myself that the years have changed. It is getting hotter everywhere”

“I have seen for myself that the years have changed. It is getting hotter everywhere. We are waiting to see what God will bring us, whether He will give us water or not. The late rains at the end of the year no longer come”.

Martina makes some income collecting firewood and selling it in Kotido town, and by brewing and selling local beer. She says:

“If things don't change for the better, I will sell my labour to earn money. I can carry my tools and go to work on the road or do any kind of work to earn money to feed my children”.

There are varieties of trees that withstand drought, like the Valentine tree or the Aperu, and in extreme circumstances people pick their leaves to make a sauce or mix with sorghum flour. She adds that every time she goes to cut wood she has to walk further, as all the trees near her village have been cut down. That exposes her to danger from attack. With the money, she buys salt and small fish. Her biggest worry is the medical expense if one of her children needs to go to hospital.

Oxfam's programme in Karamoja is based around empowering communities to tackle the challenges they

face through improving their ability to demand their rights and engage effectively with government. Another dimension of the programme is to enhance the returns from agro-pastoralism. Although the Karimojong men and boys are mobile with their cattle, women like Martina and the children and elderly do not go with them but remain behind in the dry lands with any sick or lactating animals. They can grow some cereals in the short rains and Oxfam is helping them establish grain stores.

Joseph Wangoolo, Oxfam's Pastoralism Coordinator, says:

“Pastoralism is highly adapted, well thought out and uses resources very efficiently. But it faces many challenges, climate change being one. People recognise the need for diversifying some things which can support their livelihoods system so we look at all these things, but as a support for pastoralism, not as an alternative”.

In such ways many pastoralists are willing to experiment and find ways of diversifying their livelihoods, while preserving the core of their way of life. Unfortunately they are doing it at the same time as increased drought is making moves towards agriculture as an additional livelihood strategy more difficult.

In the lower Semliki valley on the wide grass plains below Lake Albert, the men of the Butuku Cattle Marketing and Co-operative Society (BCMCS) meet at Rwebishengo market to work out ways of coping with multiple challenges. Their long-horned cattle are suffering from drought that the men say has lowered the water table and shrunk the pasture. Children are suffering from lack of milk.

Chairperson Christopher Mujungu Abyeba says: *“In the recent past we tried to get involved with crop production, which we did mainly around our homesteads by fencing with barbed wire and then by putting reeds around to keep the cows off, then by planting cassava and potatoes*



and some varieties of mango trees. But as we began, suddenly the patterns of rainfall were no longer the same and that distorted all our plans. Whatever we grew just became dry and we couldn't know when to plant. So we had to go back to our former activities of cattle grazing”.

Now the BCMCS is lobbying government – they want their area to be included in Uganda's “cattle corridor” - and raising money to create six deep-water tanks. However, they say they still want to revive crop production if they can get help to test the soil – which is highly saline – and get advice about what crops and fruits will work.

The BCMCS is also working to try to reduce the number of animals that depend on the communal pastures, as this has led to over-grazing. The River Semliki marks the boundary between Uganda and the Democratic Republic of Congo (DRC) and contrast between the greenery evident on the DRC side and the scanty grass on the Ugandan side is marked. The association wants help to introduce better breeds so that owners can get good milk and meat yields from fewer animals.

Other important forms of pastoralism in Uganda that differ from that typical of Karamoja or Semliki, have also been affected by climatic changes. In Teso region, for example, bulls are bred for ploughing. The floods that hit Teso last year, which were triggered by unusually heavy rains further north, hit both people and animals hard. Countless families lost their harvests while the floods meant that there was no pasture for the cattle. The cattle broke out in skin diseases and some animals got trapped in the mud and died. Elotu Joseph Elyanu, District Agricultural Officer in Amuria District near Soroti, sums up the double blow: *“Drought means there's hardly any pasture - and floods mean there's no grass”.*

Martina Longom collecting wood with women from the village

5. CLIMATE CHANGE IMPACTS ON PASTORALISM

Although such disasters eat away at people's assets, in this case the biggest loss of assets came before the floods and occurred because of man-made conflicts. Many families had their bulls raided or killed by the Lord's Resistance Army when it invaded their district, then military operations saw many people displaced into camps; one of the tragedies of the floods last year was that many displaced families who had hoped to go home from the camps have had to prolong their stay for yet another year.

A move to more agriculture in the area has been partly a response to this loss of livestock, as well as a result of conflict and deliberate government policies. But the loss of livestock has combined with increasingly erratic rains to make agriculture more difficult. Richard Epulu, chairman of local government level LC3 in Amuria, Katakwi, explains because of the shortage of bulls, should, say, three boys break away and have their own land they have to wait in turn for their father's bulls to plough their field. When the rains were reliable that was not necessarily a problem; the last son would finally get to plough his field and still have time to plant and reap a crop. Now the rainy season is unreliable, there is not always enough rain after the last ploughing to sustain the crop.

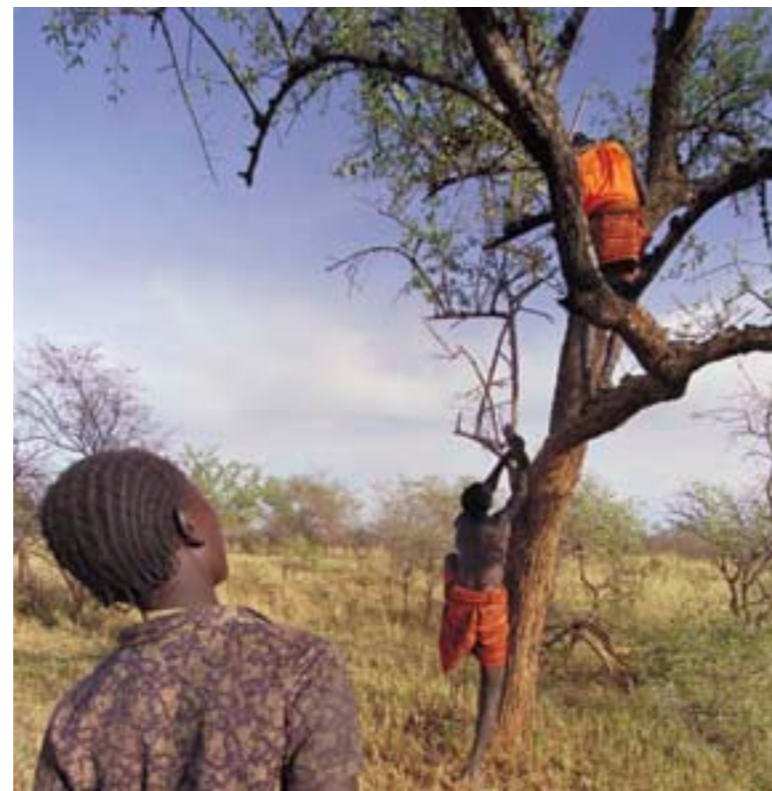
The scarcity of water in Karamoja, and the droughts there, has caused Karimojong cattle herders to move over longer distances and further into the neighbouring districts of Teso and Acholi. This has increased the potential for conflict. In a bid to contain tensions, the government has deployed the army in large numbers, and clamped down on the free movement of pastoralists to and from Karamoja. But this restricted movement has led to a severe loss of livestock and consequent hardship; in the month of

The leaves of the ekorete tree are picked and used for food sauces.

March 2008 over 100 head of cattle were reported dying daily by the District Veterinary Officer in Kotido. Oxfam has constructed a number of dams at places identified by the pastoralists themselves to reduce water scarcity and hopefully contribute to peace in the region.

Henry Odongo, acting sub-county chief in Amuria, says things have got a bit better with the Karimojong lately; there is more security and efforts at peace and trade. He muses:

"The Karimojong are maybe worse hit than us by the droughts and some may see no choice to survive but to steal cattle in Teso. Sometimes we die, sometimes they die. We are like Israel and Palestine! But we are trying to encourage co-existence. We can't use guns".



6. CLIMATE CHANGE IMPACTS ON HEALTH AND WATER

Health has always been intimately connected to water – too much of it or too little of it, water at the wrong time or in the wrong place, water that is polluted. Even, sometimes, water that is fought over. Climate change, too, is fundamentally all about water as global temperature rise increases the strength of the hydrological cycle, altering seasons, increasing evaporation and intensifying storms.

In normal years, health patterns in Uganda change markedly with the seasons, and that applies to human, animal and vegetable health equally. Malaria, the primary killer of under-fives and pregnant mothers, increases as the rains come. Floods also carry the worms that cause intestinal diseases to flourish. Cholera and bloody diarrhoea come with the rains, as does bilharzia. In Kampala urban area, intense rain combines with blocked drains to increase rates of diarrhoea.

“Because of malnutrition there's an increased susceptibility to disease. Children can't concentrate at school”

In the dry season and especially in arid and semi-arid areas, drought brings skin diseases and ringworm, and the dust ruins eyes. Ill health, in turn, is the most immediate reason people cite for falling into poverty. They become too ill to tend their land, and the costs of treatment strain their savings. Animals equally suffer when pastures are either inundated or struck by drought.

Marcel Asimwe, Group Manager of Kayonza Growers Tea Factory Ltd in Kanungu District in Western Uganda, a partner of the fair trade organisation Cafédirect, cites both drought and severe thunderstorms as reasons for more frequent crop failure or destruction, and consequent hunger. He says: *“It's a vicious cycle – malnutrition and*

illness means farmers cannot attend to their plots, which in turn makes the situation worse. Tea production has dropped leaving farmers without enough money. Child death rates have increased or if sometimes the parents die, then the children have no-one to look after them”.

Crops too become susceptible to diseases and pests that vary according to heat and humidity. In Rwenzori, Mutende Yositesi says: *“During my tender age I never heard of diseases of cassava and there was no rotting of cassava roots, but now you can no longer find good cassava in*



Mutende Yositesi

your fields. I never heard that beans had diseases. We no longer see matoke because of banana root disease. In the 1950s and 60s we used to depend much on Arabica coffee as a source of income but as of now the plants have dried up”. His friend Maate Yufesi agrees. He adds:

“We experience constant landslides on the mountain slopes. That affects the water sources; the amount of water declines and that has meant constant sickness among the children. We never knew such a thing as malaria but now it's rampant, especially on top of the hills”.



Maate Yufesi

The variety of people's diet has also been directly affected by other pressures; for example, mango trees and other fruit trees are being cut down for burning to firebricks. Baluku Yofesi in Kasese says:

"Reduced production means reduced income, obviously. And because of the reduction in traditional varieties we have poorer nutrition because we don't have the variety of foods, and because of malnutrition there's an increased susceptibility to disease. Children can't concentrate at school".

In a market in Rwebishengo, Community Development Officer Evelyn Koburaungi asks a pastoralist women's group about their experiences. She says: *"When the weather is dry there's almost no milk and it becomes very difficult for everyone because men, women and children feed on milk, entirely. Once it's not there people starve".*

Cattle herder Olive Kahiigwa agrees: *"You can have six cows and only get two cups of milk, one litre". It*

becomes meaningless. You have to dilute it with water. And then the children...." – she makes a sour face to show that they turn their faces away from the weak milk. Asked if she gets sick from diluting the milk with possibly polluted water she just laughs: *"We have to live that way"*. She adds that some women also used to make and sell ghee – an important source of income for women who have few ways of making an independent income – but no milk means no ghee. For herself, she gets some income selling sodas and mineral waters at the market, although other women are selling the same things so it is hard.

Human, animal and vegetable health is intertwined, and it is ultimately a function of a healthy environment. In that respect, Ugandans feel that their country is falling sick. A recent influential study of the Rwenzori range has shown how Nature's ability to supply water and other ecosystem services is increasingly unable to meet humanity's demands; and furthermore, that Nature's stocks are being diminished by climate change. Rising temperatures and deforestation have been blamed for shrinking the ice caps on the mountains and reducing the fogs and rains that used to envelop the mountains on an almost permanent basis.

Thomas Otim, Programme Manager for Rwenzori for the Worldwide Fund for Nature (WWF), and one of the study authors, says the snowline is moving up the mountains and so is vegetation like bamboo. That is squeezing the space for the swamps and bogs, which, with their flora and fauna, are extraordinary and unique to Rwenzori. At the same time, a proliferation of gravity flow schemes to provide clean water to settlements down below - which were done he says without proper hydrological surveys - are draining the bogs. He says:

"The bogs up there need conserving because it's like a sponge which traps the water from the rain and the glaciers. But they are drying out. If the rain overwhelms the bogs then floods happen and cause tremendous damage. Ultimately the taps go dry so these gravity schemes are white elephants".

6. CLIMATE CHANGE IMPACTS ON HEALTH AND WATER

Part of the answer, he says, is to put the environment and natural resource management genuinely at the heart of planning, and co-ordinate all development plans based on them; in particular, to stop measuring success by how much water can be extracted but to base production on what is needed to ensure the continued health of water catchments and particularly wetlands.

The floods of 2007

The heavy rains that fell in North and Eastern Uganda between July and October 2007 and the inability of the drained wetlands to absorb the water led to flooding, landslides and water logging in 22 districts.

An Oxfam water survey in 46 villages in Bukedea and Kumi districts, for example, revealed that of 98 protected water sources, 89 were contaminated, mostly by floodwater. Oxfam public health assessments found widespread destruction of latrines – 100% of latrines in some villages. The lack of clean water and sanitation posed a significant risk of outbreaks of waterborne diseases and humanitarian access was impeded as floods cut bridges and roads. Monitors from the World Health Organisation saw a massive increase in malaria and dysentery. In just one week, from 7th October 2007, 70 cases of dysentery were reported in Kumi and Bukedea districts. Over 5,700 cases of malaria were recorded in Kumi district health centres during that same week, and over 1,500 in Bukedea.

The flooding and water logging seriously endangered crops and food stocks. In the most affected districts, 65% of the population lost 90% of their crops and this has created food insecurity that will last throughout 2008.

Ajojo Janet from Amuria district suffered from an experience typical of many. She says:

"We grew cow peas, sweet potatoes, millet, cassava, green gram, sorghum, ground nuts, sim-sim [sesame]. Our plots were flooded; we lost all of our crops. Even our compound was flooded and we couldn't dry what little we managed to rescue. We just felt helpless, our houses collapsed, we were soaked, we took refuge in a primary school".

Janet and her household, a total of 10 people, received 50 kilograms of maize from the Prime Minister's Office that was dropped by helicopter. But for some six months, the food that they have depended upon has been termites. She says:

"We take spear grass and put it in the ant's nest and pull it out. If you get two cupfuls, lucky you! Not everyone can stomach them – we sell some termites to buy beans for them".

When interviewed, she and her family were labouring in brickworks, the men loading bricks, the women fetching water, to earn money to buy enough seeds to sow in the hope of a good rainy season. Asked what she expects if the floods come again she replies: *"Just death"*.



Evelyn Koburaungi



Ajojo Janet

Elotu Joseph Elyanu, the District Agricultural Officer, observes that eating termites and wild leaves is a common strategy to ward off hunger in normal years during the “hunger gap” between April and May. But this year, he says, people started eating termites from February, even from January – indeed, they have barely stopped since the floods. And – at the time of this interview - the rains had still not come. He is worried by what he sees:

“People should be weeding their crops by now [mid-March] but they’ve not even planted because they don’t know when the rain begins. With the first rains they must just go for it, but the seed for the beans is very expensive. Poverty is biting people; they are forced to sell things. You don’t even have sorghum, so you can’t trade it for meat in the market. If it rains in April, then it will be dry by June again and our crops need three to five months to grow. Now, the situation is not good. Most people lost their crops and couldn’t dry them so most people now have only one meal a day and we’ve noticed communities have started eating wild leaves and termites”.

Oxfam intervened to help those affected by the floods and after assessing, decided to prioritise Kumi and Bukedea districts in southern Teso, and Sironko and Bududa districts in the Elgon region. In these districts latrine coverage was low compared to national level and functional latrines were flooded. People were mainly using water from unprotected rivers, springs and streams and the quality was very poor. Furthermore, community members, although they knew about the need to boil water, could not do so because of the lack of firewood for fuel. (There was, however, a total absence of awareness about hand washing). Oxfam worked with district, sub-county and village officials, including district health and water officers, to decontaminate and rehabilitate water points, install temporary emergency water systems, train and equip hand pump mechanics, reconstruct latrines, increase hygiene awareness and support community and local authority capacity to identify and address public health risks. Such measures to improve community hygiene will reduce the risk of diarrhoeal disease now and in the future.

6. CLIMATE CHANGE IMPACTS ON HEALTH AND WATER

The process of creating a national strategy for adaptation to climate change from a water resources perspective has begun. The Department of Water Resources Management and donor governments have set up a working group on the issue and several studies are ongoing. These include climate change impacts on groundwater and on freshwater resources, and a study in Mbarara on climatic influences on cattle tick-borne diseases and their controls.

Malaria on the rise

Malaria is on the rise in Uganda; the number of reported cases was 5.4 million in 2000 and 6.9 million in 2001. Malaria is increasingly reported in parts of the country where it was once rare, such as the southwestern districts of Kabale, Kisoro and Rukungiri. Children and pregnant women are particularly at risk. However, there is considerable debate about just how important rising temperatures might be in spreading malaria. Some

scientists consider that rising malaria counts can be fully explained by non-climatic factors. These include the increasing movement of people from non-malarial areas, who have no resistance, to malarial areas; lack of impregnated bed nets; increased resistance of the parasite to most commonly available drugs; deforestation, making clearings and ruts that create good breeding grounds for mosquitoes; and even the removal of papyrus marsh, which makes pools which are more suitable for mosquitoes to breed in. On the other hand, there is some evidence that rising temperatures help mosquitoes to breed more, bite more and live longer. Kevina Kisembo, a Senior Nursing Officer attached to Kasese District, thinks all these factors have combined. She says more rain prolonged into November and December means more stagnant water for mosquitoes to breed in; at the same time it is hard to persuade people to consistently use a mosquito net. The main effect of the bigger rains, though, is more diarrhoea.

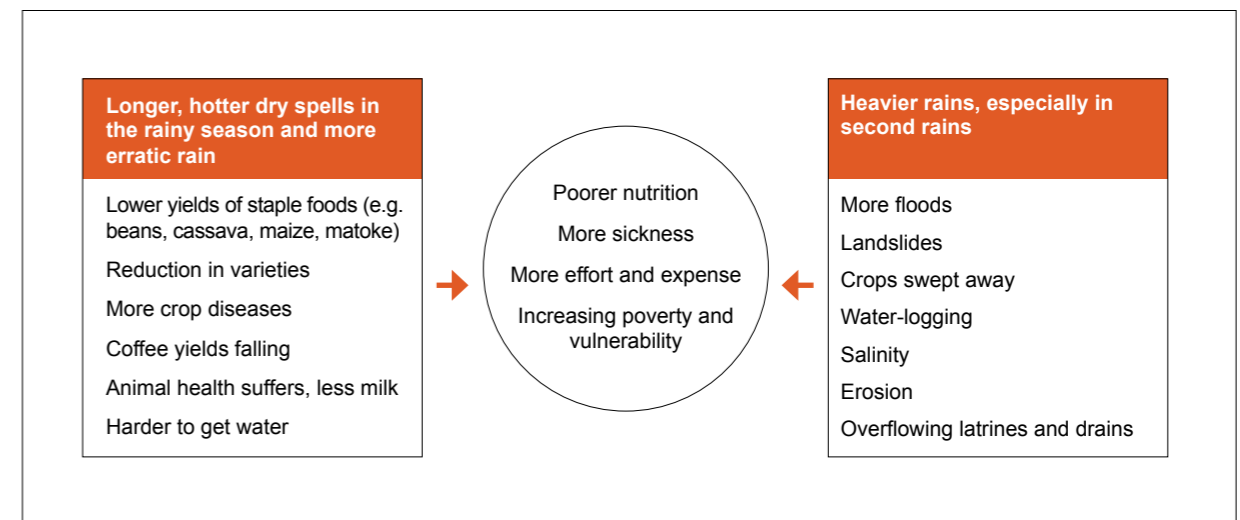


Figure 2: Climate change impacts on poverty and health

6. CLIMATE CHANGE IMPACTS ON HEALTH AND WATER

Who do Ugandans feel is to blame for climate change?

Everyone interviewed for this report described how tree felling, cultivating riverbanks and cultivating wetlands are important immediate causes of environmental problems, and most people see such practices as having an influence on the climate. Local climate may indeed be altered by these practices. But public awareness of the wider, international causes of global warming – carbon emissions from factories and transport, primarily in industrialised countries - seems to be extremely low.

Most people felt that the biggest changes in climate had come in the last 20 years, though some said earlier. They found it hard to say that there was a particular year when they first really noticed climate changes. Impacts depend so much on people's individual circumstances. People interviewed associated significant climate change with some more obvious, traumatic event in their community's



In Katwe, living can be made from fish, the salt pans, or both

life; and they usually deduced likewise that these events had something to do with changing the climate. Such traumas could be a big earthquake (that "turned the soils over"), an outbreak of disease, war and conflict (releasing gunpowder into the air) or political or religious changes, for example when the traditional rainmaker lost his authority and old ceremonies fell out of fashion.

Katwe – a climate vulnerable community?

Looking down into the oval hole in the Earth that is the crater-lake of Katwe is like looking into a beehive. Extending from the shore and encroaching into the centre of the blue water is a honeycomb of mud banks creating little ponds. In the ponds, women and men splash bare-legged, dredging up blocks of salt to spread out and dry in the sun. The water is hot and nobody can work beyond 11 a.m. Then people make their way back to Katwe village where their friends have brought in the day's catch of fish from Lake Edward and are now cleaning and repairing their boats and nets. For the people of Katwe, a living is made in two ways: either from salt, or from fish, or if you are lucky, from both.

Work in the salt pans is especially tough. The salt causes sores and cancers, especially to the reproductive organs of both men and women. But the money can be good. Kule Patrick, logistics officer of the non-governmental organisation Foundation for Urban and Rural Advancement (FURA), which Oxfam supports, explains that Katwe has a boom then bust economy; during the dry season the owners of the salt pans can earn a lot of money; similarly in the wet season, if the fishing is good, the money comes in. But in the rainy season salt selling collapses; in the dry season fish are scarce and whenever the weather is wrong, fishing is fickle.

Some people are more fortunate than others as they own several salt pans and have a stake in fishing. Some



6. CLIMATE CHANGE IMPACTS ON HEALTH AND WATER

however only have salt; some only have fishing. Others in effect have neither; sometimes people who migrate in to look for work, they have to work as labourers on other's salt pans or crew on other people's boats. But for all one fact is the same: Katwe offers nothing to live off except fish and salt. For firewood, women have to go into the nearby national park and poach trees. So although livelihoods can be profitable, they are also highly variable and vulnerable.

Now climate change is increasing that vulnerability. Kacancy Gertrude, treasurer of the Tukore Women's Group, explains how. She says that the rains have become much heavier. When it rains hard, the sides of the salt pans cave in and the pan has to be excavated again by hand. She says:

"When it rains like this it means there's no money, no income in Katwe at all".

When it is raining, however, it is normally good for fishing as the fish rise. They sink to the bottom when the lake surface is warm. Her community believes that more sun during the dry season is a factor in the decline of fish stocks, although they acknowledge that over-fishing is also to blame. Increased soil erosion in the mountains, combined with heavier rains, is also said to have increased siltation of Lake Edward and spoiled the fish breeding grounds. Catches are diminishing and incomes are being eroded. And like fishing communities elsewhere, people complain: they don't like government regulations on net sizes, or telling them when and where they might fish.

With few options open to them, the people of Katwe appear vulnerable to the impacts of climate change and other shocks. Yet although Katwe is insular, it is not as isolated as it seems. Nor, perhaps, need it be as poor as it appears. There is a salt pans visitor's centre that informs school parties about the history of the industry, although

salt workers grumble about being treated as objects of curiosity and getting nothing from the tourists (and similarly, the fishermen are likely to treat outsiders with a certain suspicion). Inside the office of the Tukore Women's Group there are several computers, and the office doubles up as an Internet business. The government has installed a water point and Kacancy Gertrude says:

"During the sunshine it's very hot and we got severe cholera, though it's reducing with the taps. That's a big change. Last year there were not many cases. There is an improvement, a big improvement in our children's health".

Reuben Mbauta, CEO of FURA, says one problem is that there is little culture of saving, so FURA is trying to encourage savings and credit groups. FURA is also helping find ways for people to diversify their livelihoods. Beekeeping, making handicrafts and setting up small businesses are examples. Mpagi Grace, the articulate and energetic young District Women's Councillor, joins in: *"What would also really help the salt workers is government to provide a mobile clinic where people can get both first aid and diagnosis of possible future illness; and help to afford proper protective equipment, so that the men do not have to wear condoms when they wade into the lake, or the women put flour in their vaginas to keep the water out".*

The Katwe example indicates that more opportunities to earn a living plus the provision of essential services like clean water and basic health care would go a long way towards creating climate-resilient communities. This is also the view of the Uganda NAPA team who state, in their Conceptual Framework for Implementation, that:

"Improving resilience of a community is...about improving access to basic needs (water, food, health, educational services) and facilitating production and diversifying livelihoods".

6. THE CHALLENGE OF GOOD ENVIRONMENTAL GOVERNANCE

Uganda has no shortage of good laws to protect the environment. There are laws saying you must plant so many more trees for every one you cut down, laws that prevent cultivation of swamps, laws that forbid people cultivating right to the edge of rivers, laws that forbid cultivation on slopes above a specific steepness.

Furthermore, every level of government is obliged, by law and government decree, to produce Environmental Action Plans (EAPs), and many have done so. Kasitu sub-county in Bundibugyo District is one such example. It has done so with a particular urgency, because a catastrophic flood hit Kitehe village, where the sub-county headquarters is based, in November 2001.

One afternoon the familiar stream that flowed down the mountainside nearby swelled to a torrent and with a sound like beating drums, burst from its banks and carved a new channel down the side of the village, tumbling down huge boulders. Taken by surprise, some 19 people were killed, their bodies swept away. The stream has now returned to its former course, but the villagers fear that at any time, it could leap again into its new channel.

Now the sub-county has an EAP, and the village has a plan of how to avert a future disaster. Kamara George, sub-county chairperson, stands in the new streambed and demonstrates how they want to build an embankment and cut a new channel that will divert floodwater, taking it away from the village and back into the main streambed. However, this would necessitate hiring a bulldozer, which is very costly, so nothing is likely to happen.

Kamara George



6. THE CHALLENGE OF GOOD ENVIRONMENTAL GOVERNANCE

Kutambaki Swizen, the sub-county chief, says that is typical for most of the actions proposed in the EAP. He says:

“The challenge is raising the funds, most of our programmes here are done by the donors or NGOs. The same applies to the EAP. The plan’s in place and the projects are there but we haven’t got the finance”.

The sub-country tries to raise money locally, he says, but what they can raise from communities is very limited.

Non-Governmental Organisations – NGOs – are helpful, but local people complain that they are generally unreliable sources of long-term finance. Their priorities change too often; their budgets depend on the sometimes-fickle generosity of donors and the public in far-off countries. Money, ultimately, has to come from central government, and for that to happen, government priorities must change.



Bita Pascal

Bita Pascal, Assistant Chief Administration Officer in Kasese District, says local government and civil society there have just got together to discuss how to address global warming, plan for it and make a budget. They took as their subject how to achieve Millennium Development Goal number seven on environmental sustainability. Everyone, he says, is concerned about the shift in the seasons and that the rivers will stop running in the future.

“The challenge is raising the funds, most of our programmes here are done by the donors or NGOs. The same applies to the EAP. The plan’s in place and the projects are there but we haven’t got the finance”

With the decline of grass people are fighting to get into the national park. The trouble is that *“environment is complex, there’s no streamlined way of addressing it so the responsibilities to do this are not there”*. Instead, he says, everyone just focuses on their own sector: the agriculture department just look at how to produce more coffee without thinking of the environment, and the roads department build more roads without thinking of environmental impacts. But if the environment alters, and in particular if there are more landslides, then the roads will not last, they will be swept away. And there isn’t the money from central government – he has just 1 million shillings in this year’s budget for wetlands – *“a drop of milk in a drum!”*.

He sees the coming together of various actors to plan about climate change and environmental challenges as the first step towards making a streamlined environmental plan for the whole region, and then to getting the resources for it. His district has taken the unusual initiative of forming a Public Private Partnership of local



Oloyit Michael at a fish farm, one of the livelihood diversification projects the District government encouraged

government, local businesses (notably the cobalt and cement industries) and local civil society organisations to discuss and act together on environmental challenges.

Oloyit Michael, several hundred miles away in Amuria District in Teso, says the challenge is two-fold: not only to obtain funds, but more fundamentally to build understanding of the importance of the environment and why it must be a priority. That requires a big change in attitude.

District government is certainly under-resourced: he is not only the District Probation Officer, but he is also the District Community Development Officer, the District Disaster Management Focal Point and the District Gender Focal Person. During the floods he mobilised the district response, working long hours and days.

Now, he says, his district is really taking the environment seriously. The floods made them environment-aware, especially about that cultivation of the swamps. He says:

“I see an improvement, but previously it was one of those departments that was sidelined. When it comes to

resource allocation generally, political leaders seem to go for things with shorter term benefits like roads or a classroom. Environment is something people don’t see”.

He adds that even now, the allocation for wetlands is quite small, the DEO has no transport, and the weather station at the district offices is not functioning. But he says attitudes are definitely shifting. The floods, he says, taught them three lessons which they are acting upon: to update and maintain their contingency plan in place for disasters; the importance of efficient data collection, management and dissemination; and the need to strengthen the sub-county and district Disaster Management Committees. As there are multiple variations of geography, altitude and vegetation cover within the district, and these all affect disaster risk in different ways, these need to be mapped and understood. Action on gender too is part of their plan.

“Women rely on forests and wetlands so really it is them we have to help and empower with alternative methods of cooking and growing more trees, then things could be done better”.



Opening up the road from Kamion, in Uganda, to Oropoi in Kenya, with Oxfam's support

Another DEO says her district council has ambitious plans. But she admitted: *“Most of our plans remain on paper”*. Speaking of her colleagues in other departments she says: *“During the planning period we seem to be together but during implementation they leave things out and we can't establish why...It's rare to find them acting to do it [take measures to safeguard the environment], and if we don't have the funds as a department it's very hard to go out and monitor how environment is being taken into consideration. Environment doesn't have the money so because we don't have the power we are always dependent. I have to get into their vehicle. They always have the fear they can't sustain you in the field”*.

When she does get out, she says, people tell her all about the environmental problems around agriculture or water, *“but when we write a report which we expect people to read...if it comes from Environment we can give it up, because we don't have the power, the cash, the fund power”*. Asked if this attitude is changing at all she looks away, and looks suddenly tired. *“It's not changing at all, this attitude. Or maybe I've not been here long enough”* (she has been in post for three years).

“We usually don't implement the whole law, we agree on certain distances because people must survive. But the river too must have a chance to survive.”

Others feel that a lack of serious commitment to the environment runs throughout government, and this is reflected in the lack of funding for local initiatives and laxities in policies and practices that run counter to policies. The capacity to enforce the law, they say, is almost zero.

6. THE CHALLENGE OF GOOD ENVIRONMENTAL GOVERNANCE



Henry Odongo and Richard Epulu

In truth, though, it would be almost impossible – and quite inhumane – to enforce the laws in their entirety, because land and fuelwood shortages are so great that farmers have no alternatives but cut down trees and cultivate river banks and wetlands.

Evelyn Magume, DEO in Kasese, explains: *“It’s difficult, because people say this is where they were born, what other land do we have, what else can we do? We meet the community, we talk, we get them on our side, we tell them the regulations. We usually don’t implement the whole law, we agree on certain distances because people must survive. But the river too must have a chance to survive”.*

In Teso, Richard Epulu and Henry Odongo adopt similar tactics. Henry says: *“We tell them to make rain there must be swamps and trees. Now people are adjusting seriously and the government is very, very serious. We are making bylaws in the sub-county and we are putting in place Environmental Protection Committees from the sub-counties to the grassroots. Getting people out of the swamps is the first thing. There’s sensitisation first - about proper ploughing – keeping a distance from the centre of the swamp”.*

There is also a stick with the carrot. *“Under the bylaws a person can be locked up for a few days while they are being sensitised, and fined”.*



Uganda’s national parks need their value recognising

6. THE CHALLENGE OF GOOD ENVIRONMENTAL GOVERNANCE

Richard says it is vital to give people incentives as well as sticks. In the district they are encouraging model farmers and “farmer field schools” and pushing new crops and livelihood options, like fish farming and better quality cattle breeds, as well as elephant grass fences to keep livestock in.

Elotu Joseph Elyanu, the District Agricultural Officer, is encouraging a four-fold strategy of drought-resistant crops, short-term crops, early planting and, for some, water-harvesting and irrigation. Upland rice, which needs much less moisture, should substitute for the rice grown in the swamps. Getting the right seeds to farmers is also a priority: most farmers depend on home-saved seeds and, as in Rwenzori, some local varieties of crops, including ground nuts, have been completely wiped out by drought.

The dilemma of parks and national protected areas

An increasing dilemma is around the management of Uganda’s national parks and protected areas in the face of growing populations and demands for fuel wood and land. A consistent and increasingly angry complaint by people living around the parks is that they are hemmed in, denied access to good land and to timber, and that wildlife is regarded as more important than them. People near the parks regularly enter them, particularly for firewood, often bringing them into conflict with park rangers. “*We are all poachers*” is a common refrain.

Karamoja provides an example of this apparent imbalance. Joseph Wangoolo, Oxfam’s Pastoralism Coordinator, says:

“In the recent past the Karimojong people had no legal rights to their own land because it was all gazetted for other purposes (hunting grounds, forest reserves or

parks or for mineral extraction). Does it take the government decades to realise that any people deserve the right to exist in their own land?.”

Even without considering the importance of the parks as globally vital hot spots of biodiversity, or sources of essential and valuable environmental services to humans and their animals and plants, notably the regular supply of water to the lowlands. This will be even more crucial as climate change bites. Such services are literally priceless, as they are extremely difficult to value; this has also meant that they have sometimes been considered of no economic worth. But new costings by CARE Uganda have shown that the parks are also of enormous direct economic benefit to Uganda’s poor – “*a result of illegal harvesting of resources from the park*”.

Edith Kabesiime, CARE Technical Manager, Community Conservation, says a new approach to conservation recognises that access restrictions significantly affect the livelihoods of poor communities, and that equity and social justice in conservation are becoming more important and rewarding or compensating communities for playing a stewardship role has the potential to reduce local level costs and enhance benefits, thereby helping households escape from poverty. She says:

“Ignoring such contribution has a number of implications – inequity in national budgetary allocation to the wildlife and forestry sectors, and inappropriate and irrational investment decisions such as the degazettment of protected areas to give away for large scale agriculture, leading to severe erosion of environmental goods and services, which undermines poverty reduction efforts in other sectors” †

† Source: Kasese District Public Private Partnership conference 4 June 2007, Localising MDG 7 in celebration of World Environment Day 2007.



Lake Katwe salt pans

7. SUMMARY: THE IMPACTS OF CLIMATE CHANGE ON POVERTY IN UGANDA



Erratic and unpredictable rainfall and extremes of temperature are not new phenomena. Farmers and pastoralists across the world are highly skilled at living and working with the vagaries of climate. But life is becoming more difficult as global warming affects climates and makes the weather even more unpredictable.

Oxfam is particularly concerned by the global injustice of this situation. Africa, as a whole, currently contributes only 4% to global CO₂ emissions, with the vast majority coming from land use changes.[†] Most of the current warming is being driven by outpourings of greenhouse gases from the coal, oil and gas that powered the industrial revolutions in Europe and America from about 150 years ago. These gases act like an additional blanket on top of the layers of gases that naturally enclose the Earth. As a result, more of the Sun's heat that bounces off the surface of the planet is trapped inside our atmosphere, instead of escaping into space.

A rise of 2 degrees centigrade above pre-industrial temperature levels is now widely accepted by climate scientists as the threshold at which highly dangerous, and possibly dramatic and unpredictable, climate changes become much more likely. Oxfam and other development agencies have called for global action to keep global temperature rise as far below 2 degrees C as possible. Rich industrialised countries, which have both historic responsibility and the greatest capacity to act, must take the lead and cut their own emissions first and fastest. However, even if carbon dioxide emissions are drastically reduced in the near future, there are many years worth of warming built into the global climate system. If emissions continue to grow rather than reduce, global temperatures will rise to more than 2 degrees and probably as much as 4 degrees. If so this would mean a world warmer than at any time in the last 800,000 years.[‡] Therefore, societies the world over must also adapt to higher temperatures and their implications.

[†] World Bank, *Making Development Climate Resistant: A Strategy for Sub-Saharan Africa*
[‡] Sir David King, former chief scientific adviser to the British Government.



Wilson Mukirane

In its report “Adapting to Climate Change: what’s needed in poor countries and who should pay”[†], Oxfam says that rich countries, primarily responsible for creating the problem, have a dual responsibility: to stop harming, by cutting their greenhouse gas emissions, and start helping, by providing the finance for adaptation. In developing countries worldwide, Oxfam estimates that adaptation will cost at least \$50 billion each year, and far more if global emissions are not cut rapidly. This finance must not be counted towards meeting the UN-agreed target of 0.7 per cent of national income for aid – finance for adaptation must be additional to this.

As we have seen, Uganda’s climate is changing. In particular, its once reliable main rainy season from March to June is becoming less so. Paul Isabirye, Principal Meteorological Officer in the Department of Meteorology in the Prime Minister’s Office, says: “Production from the agriculture sector is becoming less and less as we experience more extreme events which are becoming more frequent and more intense, notably droughts. The rain oscillation is becoming bigger, rainfall distribution is poor so planning on seasonal rains is becoming harder and harder”.

Poverty is linked to climate and can be induced by climate change. Put simply, lower yields mean less food

and greater hunger. More illness is also linked to seasonal climatic variations, with malaria cases, for example, shooting upwards in the rainy season. Ugandans cite illness, with the consequent inability to work and the costs of seeking medical treatment, as the main immediate reason for falling into poverty. But climate alone, not even the more extreme climate that will be caused by global warming, is rarely the reason people fall into poverty. It can be the trigger, but not the main cause; the proverbial “last straw that broke the camel’s back”. For example:

- **Conflict:** City dwellers point to the presence of people from Karamoja begging on the streets of Kampala as showing that increased drought has made life increasingly difficult for pastoralists. It has, but drought was only the last straw for certain people who had already lost their assets. Most Karamoja people in the capital are from one specific ethnic group, the Bakora. They have suffered a series of blows over several years, losing their cattle as a result of conflict over dwindling resources.
- **The way markets operate:** Farmers who spoke to us tell how climate change has reduced their yields, but they might be able to buy more food if they got fairer prices – if they had better access to markets and did not have to sell their cocoa or vanilla to middle men at relatively low prices.
- **Gender discrimination:** A widow and her children might not be able to grow enough to feed themselves because of poor rains or floods, but it does not explain why she does not have enough land to support herself in the first place; that may be because she has been powerless to stop her land from being taken from her by male relatives.

[†] www.oxfam.org.uk/resources/policy/climate_change/bp104_climate_change.html

[‡] Source: Carmichael and Ramanathan, *Nature Geoscience*, reported in *The Guardian*, 24/03/08

8. ADAPTING TO CLIMATE CHANGE – UGANDA’S PLAN OF ACTION

Persistent poverty, ill health and desperation make people vulnerable. Reducing vulnerability by tackling poverty, ill health and desperation is essential to be able to cope with bigger climate changes induced by man-made global warming as they really begin to bite in the near future. In Oxfam’s experience and analysis poverty is not natural; it is neither part of an ordained scheme of things nor is it primarily due to natural causes. Poverty is made by human beings, and can be removed by them. Climate change, too, is not “natural”. There is natural climate change, but man is forcing the climate towards extremes greater than it would otherwise reach through the emissions of carbon dioxide and other greenhouse gases. Alongside industrial processes and transport, deforestation and burning of wood for fuel are lesser, but important, contributors. Indeed, “black carbon” from smoke sources including burning wood and dung may have more impact than previously thought – as well as being directly damaging to the lungs and

eyesight of the millions of women who cook using fire wood, and their children.[‡] Furthermore, cutting trees for fire wood and draining swamps for crops mean that for the sake of a relatively short-term benefit, ecosystems – and therefore the people who live in them – will be less equipped to adapt to rising temperatures. Climate change could make both poverty and environmental degradation worse, and in so doing, create a vicious downward spiral. Tackling local environmental problems will secure more resources for people both to deal with their immediate problems and to deal with climate change.

Wilson Mukirane, CEO of NORRACOL, sums it up: “Industrialised countries must change and cut their carbon emissions, but the common man is cutting down the trees at the same time. We must not neglect one or the other - these things must balance. Capacity-build the local man economically to reduce deforestation so that the carbon is brought from the air. You can’t look at industrial pollution only”.



Women clearing land for tree planting in Alango parish, Kitgum, as part of a cash-for-work programme supported by Oxfam.

Uganda, as a signatory to the United Nations climate change agreement, the Kyoto Protocol, is committed to reducing its own carbon emissions in its future development, as well as having ambitious plans to reduce the degradation of its forests and wetlands as a means of adapting to climate change.

So what is the Government of Uganda’s climate change adaptation plan?

Uganda has produced its National Adaptation Programmes of Action, or NAPA, as the first step in its bid to combat the impacts of climate change. NAPAs, which are being drawn up by Least Developed Countries, are meant to identify “urgent and immediate” priorities for adaptation to climate change.

Uganda made its NAPA public last November and launched it to the international community at the UN climate conference in Bali in December. Paul Isabireye is proud of the process by which it was created, which included consultations with communities in 12 selected districts spanning five of the country’s major ecosystems:

“The NAPA was a wonderful experience! We learned so much about how people perceived the issue and how it affected them and where they need help”.

The overall aim has been to align climate change adaptation with poverty eradication, especially with the Poverty Eradication Action Plan (PEAP). The NAPA also places climate change impacts in the context of other trends, including rapid population growth and the fact that 99% of rural Ugandans use wood or charcoal as fuel.

Uganda’s NAPA – what the people said

Poor communities, civil society organisations and district political leaders were unanimous: Uganda’s climate is changing.

Communities testified to the NAPA team that in their experience, *“the rains are decreasing in amount, and yet they fall in concentrated heavy showers and storms, leading to landslides, floods and soil erosion”.*

A common refrain was about how water levels were declining, valley dams and fishponds drying up and water tables falling.

They identified the strategies they use to deal with current climatic problems. Worryingly, many of the most common strategies are those that tend to have negative impacts on people’s physical and mental health, on social relations and on the environment. Such strategies are also to various extents the products of other pressures, notably population growth; for example, shifting cultivation and incursions into vulnerable or protected areas – forests and wetlands. As populations grow, land is fragmented, leading to land degradation and encroachment. This in turn makes people ultimately more vulnerable to climate shocks.

Two other common strategies are bush burning and migration. Bush burning can improve pasture quality, but it can also cause huge fires and loss of biodiversity. Migration can be a traditional and effective coping mechanism, as used by pastoralist communities or lakeside communities who settle on suds, or floating islands (e.g. at Nakasongola). But as land becomes less available to move around, migration can become problematic, leading to friction between communities and social disintegration.

At the far end of the scale, certain coping strategies are born of desperation and are extremely harmful and corrosive: “idling”, the sale of assets or going into debt, or “famine marriages” where daughters are sold to reduce the number of people to feed and to obtain money as dowry.

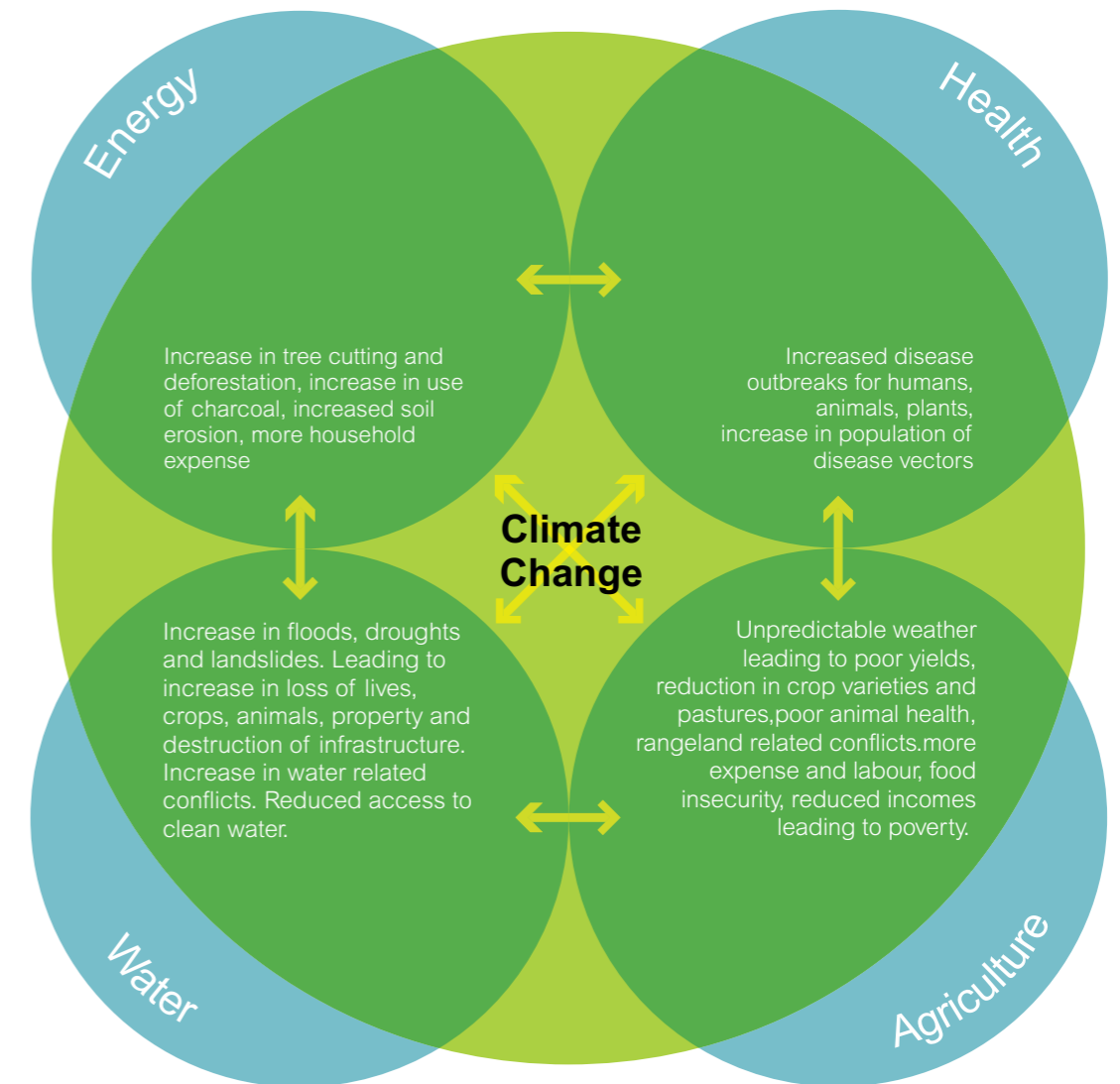


Figure 4: Impacts of Climate Change on Livelihoods



Paul Isabirye

Uganda’s NAPA – whose priorities?

Communities were asked to say which interventions in which areas they felt would bring most benefits. They identified 10 such. By percentage of people interviewed they called for: indigenous knowledge (IK) and awareness creation (20%); farm forestry (18); water resources (16); weather and climate information (11); policy, legislation and planning (11); land and soil management (9); disaster preparedness (7); alternative livelihoods (4); health (2); and infrastructure (2).

The NAPA team then studied how these priorities matched against three levels of criteria. The first matched them against national development priorities, notably aligning them with the PEAP and actions to meet the Millennium Development Goals; the second against implications at a community and ecosystem level; the third against urgency and immediacy. As a result, prioritisation by communities was *“improved by taking into account the relative importance of the intervention areas to the national development goals”*. The prioritised areas for intervention emerged as eight, namely:

1. Land and land use;
2. Farm forestry;
3. Water resources;
4. Health;
5. Weather and climate information;
6. IK documentation and awareness creation;
7. Policy and legislation;
8. Infrastructure.

It can be seen that the process resulted in the upgrading or downgrading of some priorities, notably the area of indigenous knowledge, which communities felt was very important. Furthermore, when the actual projects were put forward, the order had shifted even more.

Uganda’s NAPA – the projects

In order of priority the actual projects identified for funding and implementation are listed here. The numbers are in US\$ million and refer to intervention either over a limited area or country-wide:

1. Community tree growing 3.2 or 5.5
2. Land degradation management 2.5 or 4.7
3. Strengthening meteorological services 4.2 or 6.5
4. Community water and sanitation 2.8 or 4.7
5. Water for production 4.0 or 5.0 (rainwater harvesting, low cost irrigation, valley dams etc)
6. Drought adaptation 2.0 or 3.0
7. Vectors, pests and disease control 3.5 or 8.0
8. IK and natural resource management 0.6 or 1.2
9. Climate change and development planning 0.5 or 1.2

Totals: 23.3 or 39.8 million US dollars

The ninth project tries to address some particular obstacles identified by the NAPA team. As the NAPA put it:

“The importance of climate and its relationship with natural resources and social and economic development is not well understood nor the impacts of adverse effects of climate change on development well understood either by planners or policy makers. Therefore climate change issues are not taken into consideration in the development of sectoral and investment plans”.

The Ministry of Water, Lands and Environment (MWLE) coordinated the NAPA and established an institutional framework to coordinate the implementation of the UN Framework Convention on Climate Change (UNFCCC) and Kyoto Protocol. This framework comprises a multisectoral and multidisciplinary National Climate Change Steering Committee (NCCSC) and a NCCSC Secretariat. The NCCSC advises the MWLE on climate change policy issues, although perhaps the major part of its work is to advise on approval of Clean Development Mechanism (CDM) projects.

The NCCSC will provide overall insight for implementation of the NAPA and the Secretariat will coordinate implementation. The projects themselves will be executed at field level and supervised by line institutions at district level. MWLE will be the recipient of NAPA funds.

Uganda’s NAPA – what is riding on it

Uganda has put considerable effort into developing its NAPA and in its submission, told the international community that a lot is riding on successful implementation:

“The preparation of NAPAs has not only raised awareness particularly at district and community level, but also hope and expectations. Implementation of the prioritised NAPA projects is therefore urgent. The cost of adaptation is high. Even the cost of the nine NAPA projects is relatively high. This therefore calls for concerted effort by the Government of Uganda, the climate change process and development partners. It is hoped that the funding of NAPA projects will

stimulate interest among the key stakeholders and also lead to changes in planning approaches resulting in integration of climate change issues into development planning. The climate change process view NAPAs as a success story and indeed, a learning-by-doing activity from which other developing countries could learn. However, the success of NAPAs will depend on the actions taken to meet the expectations of the vulnerable communities to whom NAPAs have raised a ray of hope”.

So far, however, the international community, which called on Uganda to develop its “urgent and immediate” plans to combat climate change, has failed to provide any of the finance Uganda says it needs to implement its NAPA. However, Paul Isabirye does not see this as a problem yet, nor does he blame donor governments or bureaucracy. Instead, he says, it is Uganda’s choice to wait: it is more important first to be clear how the plans will be implemented. *“We must get well prepared before we get the funds if we want to make an impact”*.

Uganda, he says, has been cautious and where some other countries hired consultants; the Ugandan government established a real country process that was driven from below. The next step is to take the basic plans and discuss how in practice they can be implemented. That process of consultation, which involves government ministries, local government, donors, national and international agencies, civil society and communities, started in mid-March. *“That’s our approach; this is a Government of Uganda driven agenda and timetable”* he says.

A number of questions can be raised about the NAPA as it currently stands.

The NAPA is meant to identify “urgent and immediate” needs and plans to meet them; why is it taking so long? The

8. ADAPTING TO CLIMATE CHANGE – UGANDA’S PLAN OF ACTION

government’s answer, as above, is that it is better to consult people and then create a proper plan of implementation. Another underlying reason, however, is that it is clear that Uganda’s problems are structural ones; the need for tree planting, drought adaptation, community water and sanitation, land degradation management and so on, would exist whether or not climate change was happening. In that sense the problems have to be assessed against a timescale in which the same ongoing problems have not been adequately addressed for years. Uganda’s needs are perhaps not so obvious as, say, a country like Bangladesh, which must build dykes against rising sea levels.

So what will make implementing this plan to help communities adapt to climate change any different from the many plans government has drawn up and tried to implement to help people develop? Many such plans have not been particularly successful. How will tree planting for climate adaptation, for example, be any more successful than tree planting schemes introduced for other good reasons in the past? And how will donors react – will they say these are not climate change schemes at all but development schemes and so should be funded by regular aid?

Paul Isabirye responds that this will not be “business as usual”. Climate change means it is becoming no longer possible to do things the way they have always been done before. Donor governments too have to understand this and be prepared to finance the incremental costs involved in bringing climate change considerations into all development processes and planning. If development is not “climate proofed”, their investments will be wasted.

“It’s time to factor in climate change and that’s where the integration into development planning comes out as deliberate”.

He and his colleagues are thinking about focusing the NAPA down on particular communities and investing in

them in various ways to see how they can be made “climate resilient communities”. They would learn what makes a climate resilient community and how to make it work. But will concentrating on communities, even perhaps a large number of communities, create the systematic changes in policies and practices that are also needed for successful adaptation that is truly national in scale?

He says in thinking about how to implement the NAPA they have moved away from the listing of interventions in strict priority order. Some will be more appropriate in some places than others, but all of them need to be tried and joined together. The concept of climate resilient communities allows all the interventions to be tested. It is also his response to suggestions that having consulted people about their own priorities, the NAPA has finished up downgrading their first choice – indigenous knowledge – in favour of more tangible interventions like tree planting. But if there are, effectively, no priorities, will donors be convinced?

Finally, can the government be trusted to manage the money so that it flows to communities at the sharp end of climate change, and not divert it en route? Some sceptics say not: Bishop Jackson Nzerebende is one. Citing the extremely controversial proposal by government to allow sugar cane barons to log the Mabira Forest reserve, which has been defeated, at least temporarily, by civil society, he says:

“This regime is not organised in terms of implementing their own laws. The donor community needs to influence the government; it should put more conditions on the grants it gives; they should specify for what, and also send more money through non-governmental organisations than to government. Pin the government, tie grants to observing policy and be strict with accountability and corruption”.



Members of the Tukore Women’s Group have set up a shop selling fabrics as a way of diversifying livelihoods

8. ADAPTING TO CLIMATE CHANGE – UGANDA’S PLAN OF ACTION

Paul Isabirye says indeed, public investment in various sectors – in meteorology, his own speciality, for instance – has been too low, but he feels that it is too easy to blame politicians for all the problems people face. The livelihoods of people in a society like Uganda that are so heavily based on natural resources and rainfall for its agriculture, are being directly hit by climate change; *“and this directly explains escalating poverty levels to a great extent”*. There still needs to be an evolution in thinking and planning before the commensurate investment can be made, which is where raising public awareness becomes important, to make politicians understand better.

The NAPA team is now talking to stakeholders to discuss the mechanics of implementation, including: should the funds be in one basket? And what mechanisms or procedures will be used for the procurement of goods and services? Should government procurement procedures be followed and if so, what will be the impacts, including overheads? Other important challenges are identified in this report, and could be more explicitly part of the NAPA - notably energy-efficient stoves. Farmers also cite access to sufficient and affordable seeds, especially quick-yielding and drought-resistant varieties, as a major problem.

Finally, if all obstacles are overcome, will the money for adaptation be forthcoming? Money for the NAPAs is meant to come from the Least Developed Countries Fund set up in 2001 to finance preparing the NAPAs and meeting the most urgent and immediate adaptation needs identified. But the amount of money in the fund, at the time of writing this report, was pathetic: US\$67 million delivered against \$163 million pledged against an estimated need of between \$1 and \$2 billion.

It could be argued that as temperatures climb, Uganda will be owed several hundred million dollars per annum for lost coffee production alone. Given that the scientific consensus

is now unequivocal that climate change is mainly due to human activities, and that the climate change happening currently and which is “locked into” the system for the next few decades is mainly due to carbon emissions emitted in Europe and America in the last 150 years, it could be argued that those countries most responsible for pumping greenhouse gases into the atmosphere “owe” Uganda compensation for destroying the coffee industry and with it, perhaps, Uganda’s prospects for development. The chances of such a thing happening seem slim.



Floods...and droughts by Emmanuel Tonggun, aged 15, from Arua Public Primary School

Children have ‘lost hope’

Young people from Uganda showed the world what climate change meant to them when their drawings and paintings were exhibited at the UN Climate Conference in Bali, Indonesia, in December. Ms Maria Mutagambwa, Minister for the Environment, opened the exhibition, which also contained drawings by children from Bangladesh and Malawi. It was organised by Oxfam. Ms Mutagambwa noted the children had drawn images of floods and droughts. She said: *“They have lost hope and we must restore their hope in the global community”*.

9. CONCLUSIONS AND SUGGESTIONS FOR ACTION

The full implications of climate change are just beginning to be understood. Time is short, but it is never too late to bring about change. Industrialised countries must reduce their greenhouse gas emissions, but all countries must take appropriate actions. If Ugandans desire to continue striving to achieve the Millennium Development Goals (MDGs) by 2015, we must act now. We hope this report is a stimulus for change. The key principle of adaptation is to boost resilience to shocks.

We therefore believe that increasing people’s capacity to adapt to climate change will achieve a double benefit, by contributing to the goal of overcoming poverty and suffering in Uganda.

Those actions should include:

Implementing adaptation: The government is, to an extent, aware of the possible consequences of climate change, and aims to pilot adaptation through the NAPA. It is right that adaptation is being aligned with the Poverty Eradication Action Plan, but this should go further and be more rigorous, for example by piloting options for social protection systems. We also believe it is essential that the NAPA move further towards adopting a more integrated livelihoods approach, rather than a sectoral focus. There is a need to combine indigenous knowledge and practices with inputs based on science and technology. The country also needs to go beyond the NAPA, think far ahead and put in place and adequately resource a national strategy that is part of the National Development Plan (NDP).

The NAPA identified inadequate understanding of climate change and its impacts, creating a barrier to resource allocation, and weak institutional and coordinating mechanisms, as key challenges for government. Hence impacts are not properly taken into account in planning or policy making. Our report bears



Elders associate climate change with conflicts and erosion of traditions

this out. Good laws and plans dealing with the environment are often not followed or enforced. One reason is inadequate resources at local level.

Whatever institutional mechanism is selected or created to lead on climate change adaptation, requires strong leadership that is able to co-ordinate across various line ministries and brings other stakeholders to the table, especially the private sector, donors, civil society and communities.



Bush burning is a problem

9. CONCLUSIONS AND SUGGESTIONS FOR ACTION

Funding for adaptation: This will come from many sources, national and international, but rich country governments have special responsibilities to ensure that no good adaptation plans fail to be implemented for lack of money. International adaptation finance must not come out of existing aid commitments made for poverty reduction, but must be new and additional finance.

Involving communities: Understanding of the social dimensions of climate change is crucial. Communities must be consulted and involved in order to build their resilience. Diversification of livelihoods and income sources, especially in areas that face extreme events, is essential. This needs financial investment, skill enhancement and improved access to insurance. Societies will also have to learn new skills and practices that may at times contradict traditional beliefs and practices. Information, education and communication raise awareness and will help dispel uninformed beliefs and superstitions about climate change. But crucially, communities are not just there to be consulted; they have a vital role to play in appraising what is being done in their name by the government, and the policies and practices of other stakeholders, including the private sector. Civil society and community organisations need to be empowered to monitor the implementation and localisation of the NAPA and subsequent adaptation programmes. In Uganda women will be at the centre of adaptation efforts because of their paramount importance in society as farmers and as carers, and they must be at the centre of community involvement and empowerment.

Managing natural resources: The “Natural Resource Management” approach has both a direct link to combating climate change and its effects, and positive benefits for livelihoods, food security and poverty. Ultimately development cannot be sustainable unless government at all levels takes Natural Resource

Management seriously. Urgent measures need to be taken to prevent any further degradation and restore lost wetlands, forest, water bodies and other eco- systems.

Investing in agriculture: Investment in and better management of rain-fed agricultural systems – the bedrock of Uganda’s agriculture - is essential. Access to inputs including advice, information and services, better seeds and crop varieties that can cope with climatic variations, and access to credit and markets are required for adaptation and for poverty reduction alike.

Strengthening pastoralism: Mobile pastoralism is an efficient, productive system and may well become more so as climate changes. Pastoralism needs to be supported, not supplanted. The rights of pastoralists to land, to services delivered in an appropriate way, and to maintain their mobility, are essential.

Planting trees: Preventing deforestation and boosting reforestation are urgently needed. Government and donors need to examine schemes that recognise and reward growers to plant and preserve woodlands. Choice in selection of species should help support local bio-diversity and contribute to meeting the basic needs of local communities in the form of fuel, timber and other forest products. Supporting the development and rollout of alternative sources of energy, including energy efficient stoves, biogas, and solar lighting will reduce pressure on existing forests.

Getting information to people: Information is critical for adaptation. The government needs to invest in meteorology and ways to disseminate the resulting reliable data swiftly and in ways people can understand. Arrangements with media, local radio stations and agricultural extension workers to communicate that data and to advise farmers and pastoralists will be very important.

Securing water: Sufficient safe water to meet the basic needs of all citizens is not only critical for adaptation to climate change, it is also a human right and the basis for improving health and well being and tackling poverty, just as sufficient water to keep ecosystems healthy is the basis for agriculture and production.

As the country will very likely experience-increased rainfall, management of rainwater and run-off needs greater emphasis. Uganda can move towards water security in many ways, including rainwater harvesting, recharging ground water, and protecting watersheds, catchment areas and water bodies from encroachment and over exploitation. Ground water is a vital national asset, and its storage and use needs improved management. Adequate drainage facilities are needed to reduce flooding. Protection and restoration of swamps and wetlands needs attention from the highest levels of government.

Improving health: It is said that a healthy nation is a prosperous nation, but climate change has ominous implications for health. Applied research will be needed to provide systematic information to understand the impact of climate changes in different climatic zones, and direct requisite resources towards preventive actions.

Preparing for problems: Climate change will bring more extreme weather with consequent risk of loss of life and assets. Perhaps most important is to prepare for the unpredictable. Climate change will mean greater uncertainty, rather than new fixed patterns of climate. Anticipation, adaptation and preparedness may not be able to prevent events like floods or droughts happening, but they can go a long way to reduce the harm and prevent them becoming major disasters. Government, donors and non-governmental organisations need to build Disaster Risk Reduction (DRR) into their development interventions, as well as being ready to respond effectively when relief is required.

10. ACKNOWLEDGEMENTS

The principle author of this report was John Magrath, Programme Researcher, Oxfam GB, who takes responsibility for the content and also for any errors of fact, omission or interpretation. It was written with the help of Savio Carvalho, Oxfam Uganda Country Director, Robert Michael Nkuba, Uganda Programme Officer Climate Change, Arthur Nkubito, Uganda Climate Change/Governance Intern, and Joseph Wangoolo, Pastoralism Programme Co-ordinator.

Oxfam would especially like to thank Reuben Mbauta and Kule Patrick of FURA, Wilson Mukirane and Isaac Mutabazi of NORRACOL, and the district officials of Amuria District, for their generous assistance and insights. We would like to thank the many people who assisted and spoke to us, some of whom are quoted, many of whom could not be for reasons of length or duplication.

The bulk of the interviews for this report were carried out in Rwenzori and Teso between 10 and 22 March 2008. Additional material came via Oxfam staff in Karamoja. We would also like to thank Cafédirect for information and quotes from tea and coffee growers in Elgon. The report was designed by Nigel Willmott.

© Oxfam GB, June 2008

Published under the Oxfam Online imprint by Oxfam GB in Uganda, Plot No 3459, Tank Hill Road, Muyenga, PO Box 6228, Kampala, Uganda, and by Oxfam GB, Oxfam House John Smith Drive, Oxford OX4 2JY, United Kingdom.

For further information on the issues raised in this paper please e-mail Kampala@oxfam.org.uk and/or advocacy@oxfam.org.uk

First published online by Oxfam GB, June 2008
Online ISBN 978-1-84814-039-4

This paper is available to download from the Oxfam Publishing website. Go to www.oxfam.org.uk/publications and search for "Turning up the heat: Climate change and poverty in Uganda" or use the ISBN above.

All rights reserved. This publication is copyright, but may be reproduced by any method, without fee, for advocacy, campaigning, and teaching purposes, but not for resale. The copyright holder requests that all such use be registered with them for impact assessment purposes. For copying in any other circumstances, or for re-use in other publications, or for translation or adaptation, prior written permission must be obtained from the publisher, and a fee may be payable.

For any re-use as set out above, e-mail publish@oxfam.org.uk to register use or to seek permission.

Oxfam GB is a registered charity No. 202918 and is a member of Oxfam International.

“They [children] have lost hope and we must restore their hope in the global community”

Ms Maria Mutagambwa,
Minister for the Environment

