The winds of change: Climate change, poverty and the environment in Malawi

Oxfam International

Acknowledgements

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Front cover image: People in Malawi say the familiar winds are becoming more erratic and unreliable, and sometimes dangerously strong. Droughts and floods are increasing, partly because of deforestation and the cutting down of reed beds such as these on the shores of Lake Malawi. Photo: John Magrath/Oxfam.

All photographs in this report are by John Magrath or Elvis Sukali unless otherwise stated. Designed by Nigel Willmott.
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Contents

Executive Summary A wind of climate change is blowing through the southern African nation of Malawi, bringing confusion to fisherfolk and farmers alike.

"Previously water would flood mainly at the peak of the rainfall season and mainly along the river banks. These days, floods occur anytime during the rainy season. Previously people would relocate to higher grounds but these days even people settled in areas once considered safe are affected by floods"
Ebbie Mwakasungula, Village Headman, Karonga

"We expect rains and they don't come, or we get heavy rains, which only destroy and don't help our crop production"
Peter Chapasi, Thomasi village, Thyolo

"Heavy winds blow away our houses".
Enless Nakhuba, Thomasi village, Thyolo

In Malawi the winds shape the lives and livelihoods of farmers and fisherfolk. They know each wind by name, when it comes, how it behaves, its effects, and therefore, what they should do in response. But now they say that the winds that once brought rain to make the crops grow and fish to their nets no longer blow as and when they should. Instead there is a muddle of contradictory currents, both in the air and in the waters of Lake Malawi. Sometimes the winds are so strong, and rains so heavy, that they destroy houses, crops and boats.

Furthermore, people report that the main rainy season is becoming ever-more unpredictable. In general over the last 40 years they say temperatures are hotter and the rains are arriving later and becoming more intense and concentrated, which reduces the length of the growing season and triggers both more droughts and more floods.

Climate change interacts with environmental degradation, notably deforestation, and it is women who suffer most. Women have multiple roles as farmers and bringers of water and firewood and so depend very directly on natural resources. At the same time their position in society means that generally they have less access to income and credit and little or no voice in decision making.

That resulting increased vulnerability feeds the spread of HIV and AIDS, for example if women resort to selling sex for food during the hungry months before the harvest. The spread of HIV in turn weakens people's ability to respond to the changing climate. It saps both individual strength and institutional capacity to respond to the twin challenges of climate change and HIV and AIDS.

People's observations of winds, rain and temperatures are consistent with what scientists say are the likely climatic changes resulting from man-made global warming, caused primarily by the emissions of carbon dioxide and other so-called "greenhouse gases" through the burning of coal, oil and gas by today's industrial powers.

In Malawi, though, people connect these alterations in winds and rainfall patterns not to pollution from industry in the global North, but to environmental changes closer to home: notably deforestation. Malawi has one of the highest rates of deforestation in southern Africa, primarily because the rapidly rising population has almost no access to any other form of fuel and so depends upon charcoal for cooking. As a result, people have also lost access to

Rose Kaluma working in the family's vegetable garden. Rose explains: 'I've always had a garden as well as land where I mainly grow maize.' Malawi has enjoyed two record breaking harvests in a row. However, Malawi is dangerously over-dependent on maize. The challenge now is to diversify crops, implement effective agricultural policies and practices and of course rely on continuing good rains. Photo: Annie Bungeroth/Oxfam

forest foods that once helped them through hungry times.

Now there is a big drive to plant more trees. But as one village woman asked Oxfam researchers, *"if we plant all these trees, will that solve the problem?"*. Planting trees in Malawi will not stop global warming which is primarily due to carbon dioxide emissions from industry and transport. But, up to a point, and as part of a suite of adaptation practices, it will certainly help people to cope with climate change impacts by shading the soil, acting as wind breaks, cutting soil erosion and smoothing water flows thereby reducing sudden flooding.

Other essential adaptation measures must be to boost agricultural productivity and diversify crops. In Malawi people say *"maize is life" – "chimanga ndi moyo"*. Maize is the staple crop upon which virtually everyone depends. But traditional varieties no longer have time to ripen before the rains stop – or floods rot the plants before they can be harvested. The result has been hunger on a regular basis, and sometimes, the horrors of starvation.

Yet in spite of this, Malawi is also beginning to demonstrate that with the right support, farmers can succeed and overcome some of the limitations of both poverty and a fickle climate. Crucially 2006 and 2007 were years of generally good rain and just as crucially, improved government policies and support, meant two record-breaking national maize harvests in a row. The record-breaking harvests give hope for the future, albeit fragile. Malawi is dangerously over-dependent on maize. Building resilience to climate change means seizing this moment to diversify crops and diversify rural livelihoods ready for the next time that the rains are poor.

Good adaptation and good development are intimately linked. For farmers it starts with being able to get access to improved seeds – faster maturing and higher yielding - but to fulfil the potential of such seeds requires much more, including training in innovative farming methods – and sometimes the revival of old methods. The use of irrigation and compost, and growing a wider range of crops, are particularly crucial in the south, where population is high and land shortages are exacerbated by the presence of huge tea estates.

But good adaptation and good development need to go further than good farming, especially for women. Women interviewed for this report see adaptation in a holistic way. Women want better services and help to diversify livelihoods, ranging from assistance in looking after HIV and AIDS orphans to free up some of their time and energy, to access to credit and loans to start small businesses.

The government of Malawi has developed a list of priority activities that it wants to implement in order to start adaptation to climate change. Malawi's National Adaptation Programmes of Action (NAPAs) aim to improve community resilience, restore forests, improve agricultural production, and improve preparedness for floods and droughts and boost climate monitoring. To fund Malawi's NAPAs requires US$ 22.43 million. To date, however, no money has been forthcoming from the international community that asked Malawi to develop its plan. Oxfam says the ongoing failure to fund the NAPAs drawn up by Least Developed Countries is unacceptable. However, Civil Society Organisations in Malawi also say lack of donor funding must not become an excuse for inaction: the government can and should do more even if the NAPAs remain unfunded.

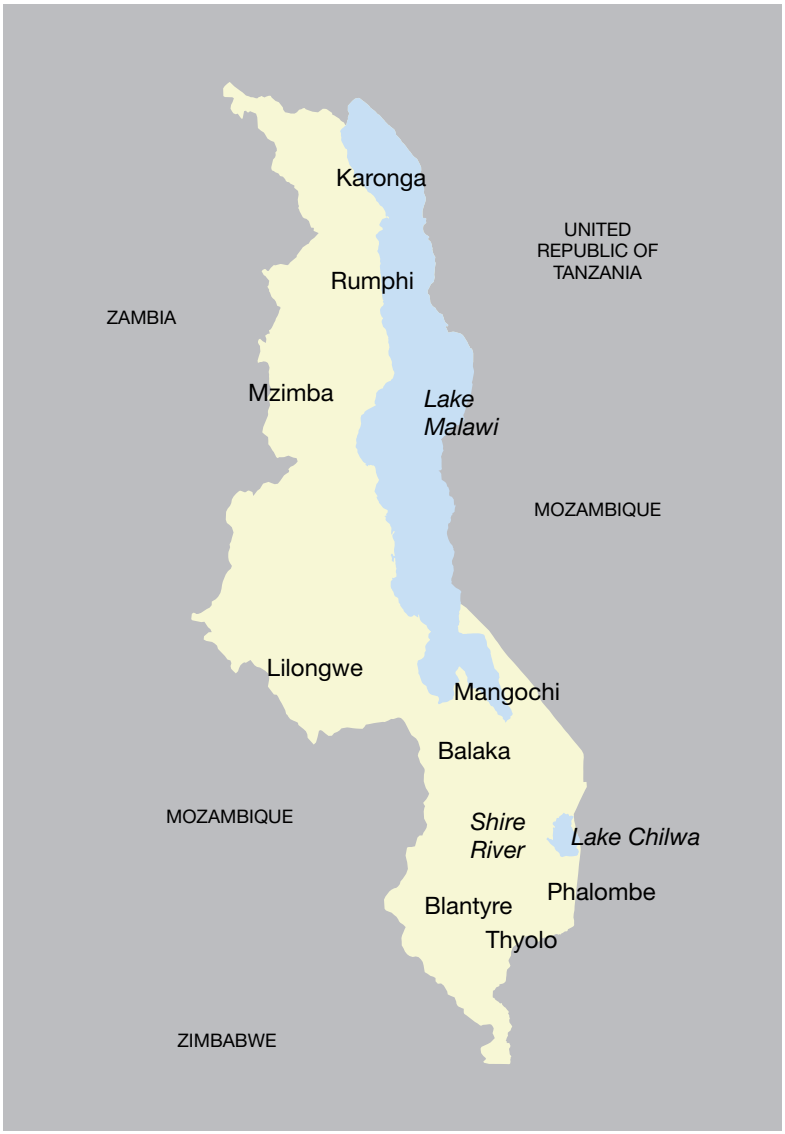
Whatever Malawi does to adapt to continuing climate change – and there is much it can do – it is in the context of still-rising global temperatures. If temperatures

cross the threshold of an average 2 degrees Centigrade higher than in pre-industrial times, then scientists fear that the Earth's climate will change in sudden and radical ways. It is unlikely that any society, anywhere, will be able to adapt effectively to such an increase, especially one as poor as Malawi.

To prevent such dangerous temperature increase Oxfam is among thousands of Civil Society Organisations campaigning for industrialised countries to act urgently to massively reduce their greenhouse gas emissions.

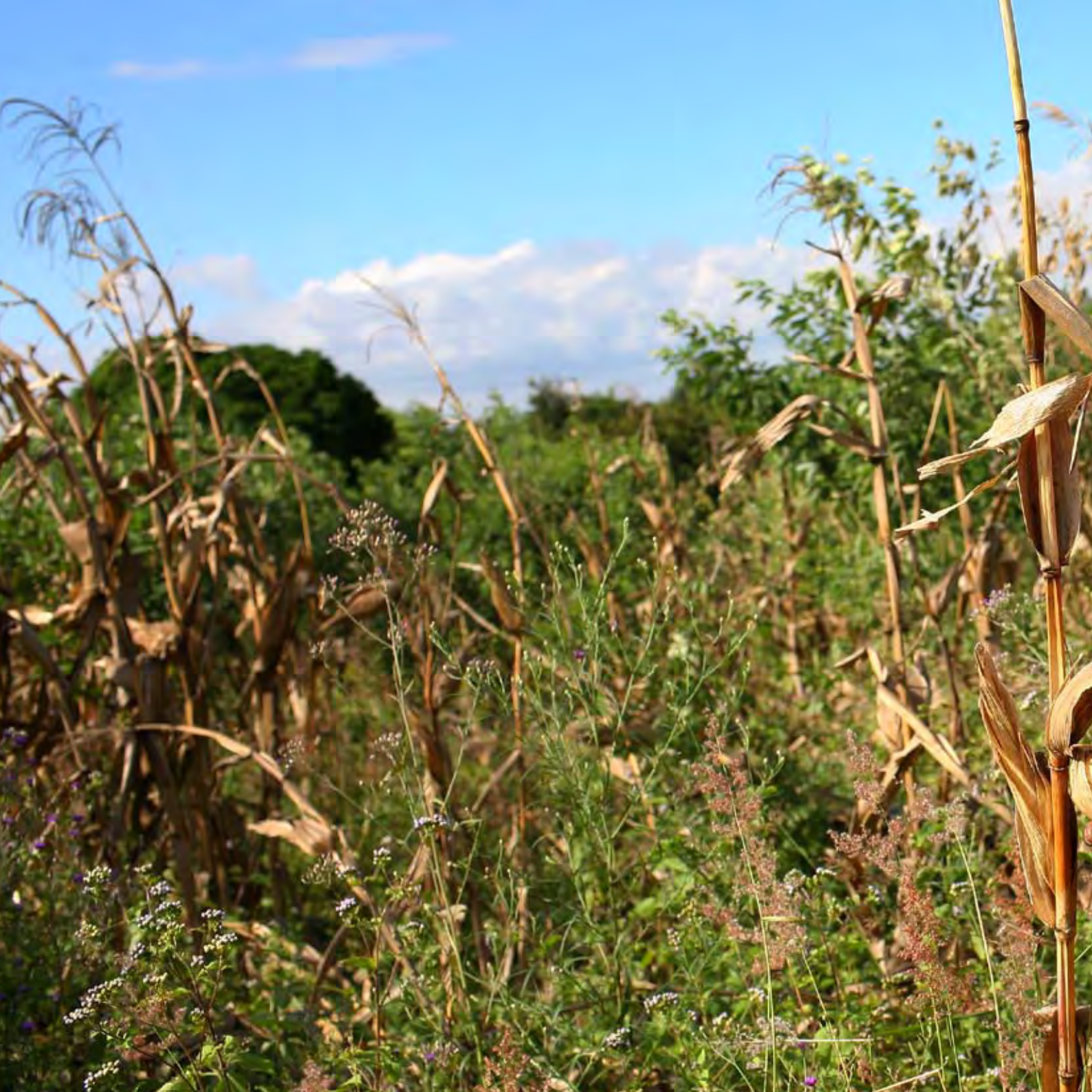
However, even if the necessary actions are taken to slash greenhouse gas emissions, heat that has built up in the oceans and atmosphere means temperatures will rise further before levelling off. So Malawi, and other African countries, will have to do more to adapt, both to the vicissitudes of current climate and to future climatic uncertainty. Good adaptation will have a double benefit, in the present as well as the future.

As well as the right policies, the right support from the international community is equally essential. Such support is only right and just; Malawi's own greenhouse gas emissions are miniscule compared to the gases that the now-wealthy industrialised



Malawi: places mentioned in the text.

Next page: Subsistence maize farmer Estella Njolo. "The weather's not like when I was a child," said Estella in Kunthembwe. "There's been a big change. Rainfall doesn't come when we expect it. It should come when the maize is tasselling (growing the hairy tufts that protrude from the cob) that's when it needs all the water. This year we've had good rains and a good harvest, I'll admit. But it's May, and it's still raining! We need sun now to dry the harvested maize." Interviewed in May 2007. Photo: Abbie Trayler-Smith/Oxfam



countries have put into the atmosphere to fuel their industrial revolutions, yet through no fault of their own it is poor countries like Malawi where the consequences of climate change will be most damaging.

Yet so far support from the international community, even for urgent and immediate adaptation needs that Malawi and other Least Developed Countries were asked to identify, has not been sufficiently forthcoming. Oxfam is therefore also campaigning to see that poor countries receive the funds they need in order to adapt and survive.

The report concludes with a series of recommendations:

Recommendations for community level:

Poor communities are the worst affected by, and least able to cope with, climate change impacts. Therefore the foundation of any initiative to address climate change hinges on communities being aware of the issues, owning the process of adaptation and having the capacity to undertake and maintain adaptation. At the same time, there must be wider supportive political and institutional frameworks.

Local knowledge based on first-hand experience of climate change and adaptation is going to be critical to the successful design of community adaptation and this must be tapped.

Women in Malawi bear the greatest burdens from climate change so it is crucial that their participation is made central to adaptation efforts.

Local sustainable environmental and natural resource management are essential in order to reduce vulnerability whether caused by climate change or by environmental degradation. These should be strengthened within adaptation and also Disaster Risk Reduction programmes.

People do not perceive climate change as something separate or additional to their lives and livelihoods, but intimately connected. Therefore, it is important to ensure that initiatives to address climate change are equally integrated with the promotion and diversification of sustainable livelihoods. All vulnerability assessments need to take account of projected future climate hazards as well as current variability. Likewise, adaptation measures that address current and future levels of climate change should be given priority.

Recommendations for civil society and non-governmental organisations:
Civil Society Organisations (CSOs) working in Malawi should make climate risk analysis an integral part of all appraisals before initiating work with communities.

CSOs and INGOs should facilitate awareness and capacity-building around climate change, in their staff, their partners, government and other organisations, and in the communities which they serve.

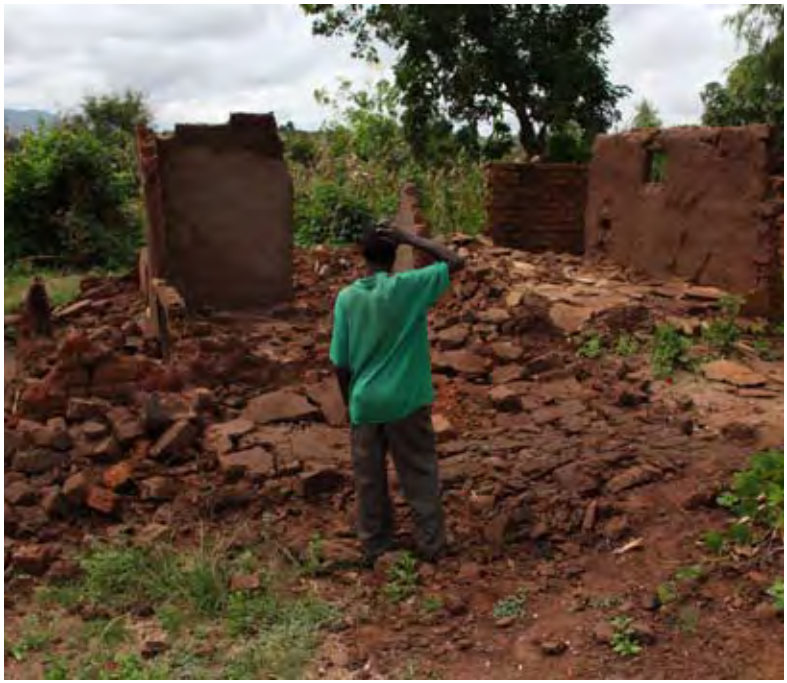
CSOs and international NGOs should work together both to strengthen community-based climate change adaptation and disaster risk reduction and to strengthen advocacy at national level. They need to advocate for government to take up its responsibilities for leadership and co-ordination at all levels, and to demand new, additional, sufficient and predictable flows of adaptation finance from the countries both most responsible for today's climate impacts and most capable of assisting. They need to advocate too for industrialised countries to drastically and urgently reduce their greenhouse gas emissions.

Recommendations for government level:
The government should strengthen institutional mechanisms for more effective co-ordination of climate change adaptation and Disaster Risk Reduction programmes. The government should establish budgetary allocations to finance the NAPA projects and further climate change initiatives. To be successful, all these efforts must involve poor communities and civil society.

The government should strengthen linkages between the Environmental Affairs department and the Department of Disaster Management Affairs. This should include developing a methodology for harmonised vulnerability and adaptation assessment.

Agriculture and related activities should get priority in climate related research. Government needs to strengthen the capacity of the Meteorological Department to improve both long-term climate modelling and regular, short-term weather forecasting and dissemination in order to give farmers the information that they need.

Government should prioritise energy efficient stoves and other technologies for cooking and discourage the continued production of charcoal, and help poor and vulnerable communities to find alternative livelihoods.



Max Munyariwa, Bvumbwe, Thyolo, Southern Malawi. "My house was destroyed last month (early March 2009). There was a very strong wind that night, and fog. My house had a grass roof so it was just blown off and the house fell down.

"Wind and rain here is not a new thing. The wind starts coming from November to January. The strongest wind usually blows from southeast to northwest and normally it comes during the rainy season. But the wind now blows in different directs. It's changing. I've noticed that the wind and rain here is getting more severe. It's causing us problems in two ways: it destroys our houses and our crops. When the maize has reached maturity, if it is waterlogged it falls over and rots.

"We have had good rain here this year and we have just finished harvesting maize but the next village (1 mile away) hasn't started yet because the rains are late." Photo: Abbie Trayler-Smith/Oxfam

Government should strengthen formal and informal education about climate change and work with CSOs to raise public awareness.

Based upon the foundation of dialogue and discussion with its citizens, the government of Malawi should proactively participate in international conferences and discussions to highlight the injustice of climate change and the plight of poor countries and communities. In view of the current round of crucial intergovernmental negotiations towards a post-2012 regime, the government should immediately strengthen its investment in capacity-building its national delegation and diplomatic corps to join with other Southern governments to press for emissions reductions and new mechanisms to ensure flows of new, additional, sufficient and predictable finance for adaptation in poor countries and communities.

The climate of Malawi, past present and future Malawi's climate is naturally variable, in large measure due to its topography. Both temperatures and rainfall vary considerably depending on altitude and other factors.

Top: Fanny Nyasulu, 51, who comes from Ntchenachena in the Rumphi district of northern Malawi.

Below: Carolyn Malema, a farmer and chairlady of the women's forum in Karonga.

Climate, past and present The country runs in a thin strip 840 kms long from north to south and the terrain varies from barely 37 metres (100 feet) above sea level in the lower Shire Valley in the south to mountain ranges some 3000 metres (6000 feet) high in the east. Furthermore, about 15% of Malawi's area consists of Lake Malawi, nearly 600 kms long, which itself affects the climate.

In the south the wet season normally lasts from November to February but rain continues through March and into April in the north. Inter-annual variability in wet season rainfall is also strongly influenced by global ocean sea surface temperatures, particularly the El Nino Southern Oscillation.

In general, the seasons are divided into the cool (May to mid-August); the hot (mid-August to November); the rainy (November to April); and the post-rainy (April-May). Maize is planted when the rains come and harvested in March and April.

The wide variations in climate, including so many micro-climates due to the variety of terrain, mean that it is hard to generalise about trends. Nevertheless, there have been significant changes observed, notably in temperature:

- Observed mean annual temperature has increased by 0.9°C between 1960 and 2006, an average rate of 0.21°C per decade. This increase in temperature has been most rapid in summer (December to February or DJF) and slowest in September to November (SON).
- Daily temperature observations show significantly increasing trends in the frequency of hot days[1] and nights in all seasons.
- The frequency of cold days[2] and nights has decreased significantly since 1960 in all seasons except SON.

Julius Nkatachi from Tsite village near Phalula in Balaka is 70 years old, and he has very definite views on how the climate has changed. He says: *"Originally there were very distinct seasons and we were very sure when things would happen. Now the seasons are not distinct, especially the hot and cold seasons. May to July was the dry and cold season, July and August a bit warmer and September to October was very hot. Originally in March and April when you were harvesting it was evident that the cold season was coming. From the end of April it was cold through to July. Now it's only cold for a few days".*

Fanny Nyasulu, 51, who comes from Ntchenachena in Rumphi district in northern Malawi, has similar experiences. She says: *"Previously the cold season would set in by mid April and would last until early August. It used to be extremely cold here. Trees were dying because of cold. If you left a metal pot outside during the night, you would find it covered by ice in the morning. This is not the case now. These days you can actually count the number of cold days in a year and they would not be more than five."*

Karonga district has always been warmer relative to Ntchenachena as it lies on the lakeshore, but the story is similar there.

Carolyn Malema, a farmer and chairlady of the women's forum in Karonga said:

"Previously the month of June was cold but nowadays people don't even wear warm clothing in June because it is warm. There is also a rise in mosquitoes. We never used to be bothered by mosquitoes in June previously but these days mosquitoes bite us all year round and incidences of malaria have risen."

Long-term rainfall trends are harder to spot and *"few trends at individual (meteorological) stations are statistically significant"*[3].

However, trends are observable across southern Africa when numerous stations are observed. And science tends to confirm what people say - that the rains are arriving later than before, and are more erratic: as a result, the growing season is shorter: the dry season lasts longer than before, and when the rains come, they tend to be heavier.

One large-scale scientific study concludes: *"Regionally averaged dry spell length, average rainfall intensity and annual 1-day maximum rainfall all show statistically significant increasing trends.... there is an indication of decreasing total precipitation, accompanied by increased average rainfall intensity.... [that] suggests that increased average intensity is concentrated on extreme precipitation days"*[4].

Future climate What does climate change mean for the future? If no concerted action is taken to reduce emissions of greenhouse gases, scientists say;

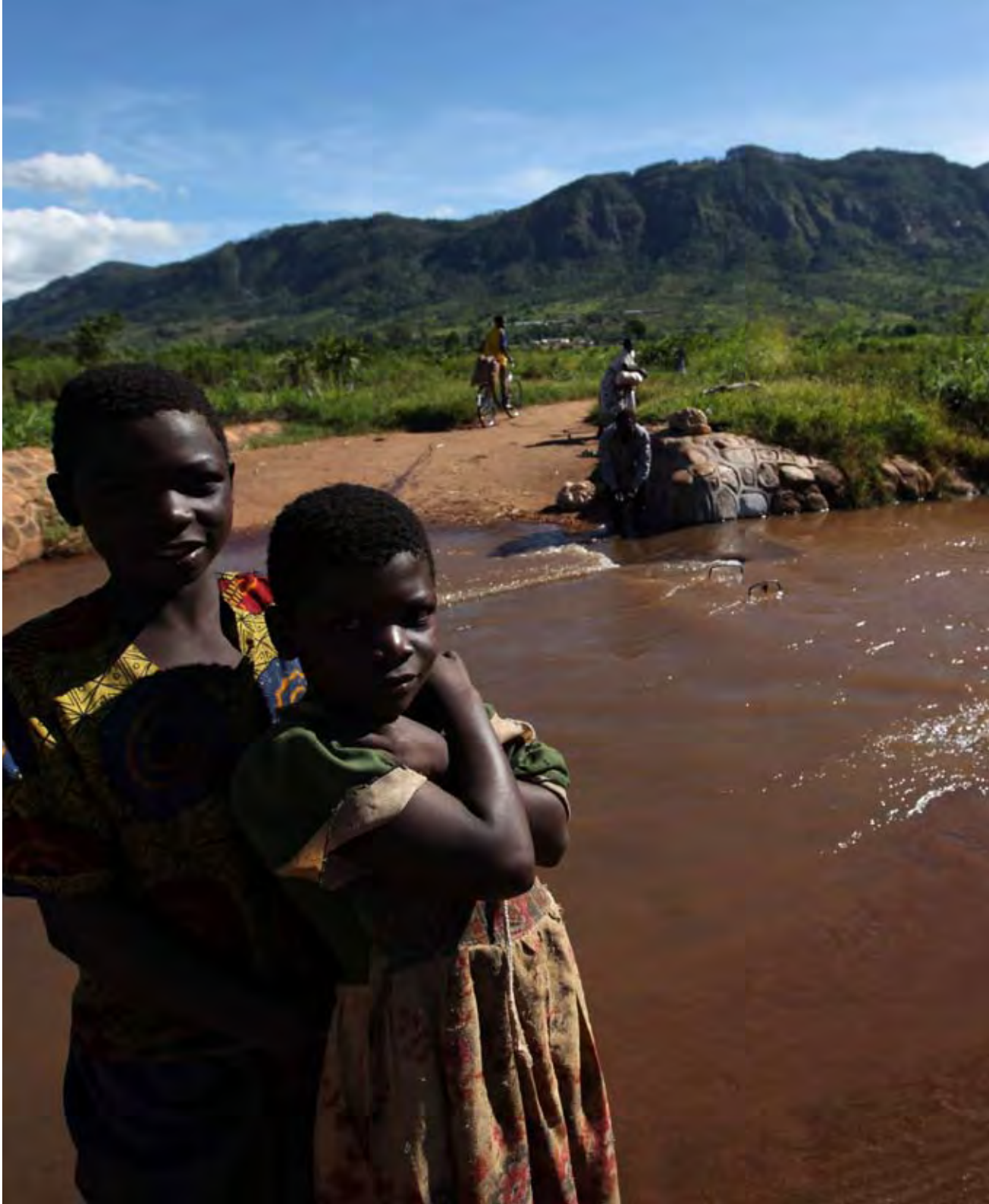
Temperature[5]

- The mean annual temperature is projected to increase by 1.1 to 3.0°C by the 2060s, and 1.5 to 5.0°C by the 2090s.
- All projections indicate substantial increases in the frequency of days and nights that are considered 'hot'.
- All projections indicate decreases in the frequency of days and nights that are considered 'cold'. These events are expected to become exceedingly rare.

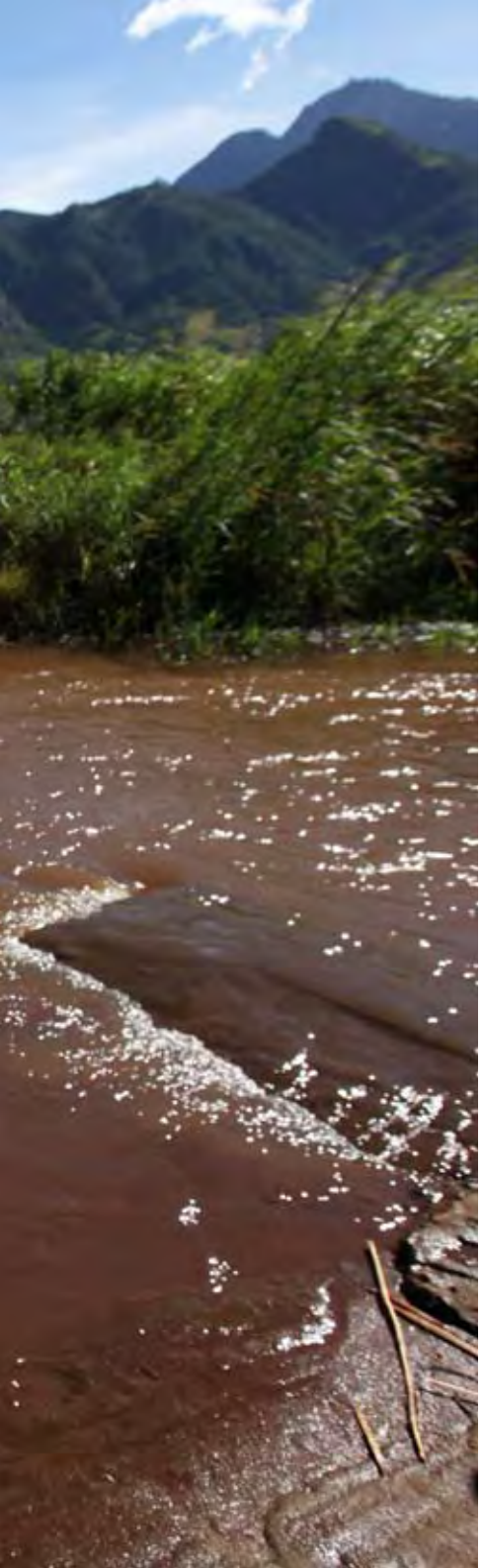
Precipitation[6]

- Projections of mean rainfall do not indicate substantial changes in annual rainfall taken as a whole. However....
- Overall, the models consistently project increases in the proportion of rainfall that falls in "heavy events".

A recent scientific study finds that there is a 90% chance that by the end of this century, the coolest temperatures in the tropics during the crop-growing season will exceed the hottest temperatures recorded between 1900 and 2006. This would likely cut yields of maize and rice by 20-40% [7].



The reservoir which feeds the extensive irrigation channels at Mnembo, Mulanje. The Oxfam-funded irrigation system has enabled 400 farming families to become completely self sufficient, cultivating different crops all year round and protecting them from food shortages and the negative affects of climate change. Photo: Abbie Trayler-Smith/Oxfam



Climate change, poverty and vulnerability

Such changes would spell catastrophe for farmers for whom any climate shock can be a disaster. Malawi is one of the poorest countries in Africa.

According to the Malawi Government's National Adaptation Programmes of Action against climate change (the NAPA, which will be discussed later) some 29% of people live in extreme poverty. Infant mortality is estimated at 134 per thousand compared with 92 per thousand for sub-Saharan Africa. The latest (June 2008) census numbered the total population at 13.1 million, up by more than a quarter in the last decade despite the impact of HIV and AIDS. However, figures for life expectancy at birth appear unreliable, given that they vary widely depending on the source, from about 37 years to 47 years or more[8]. More than 90% of the population is predominantly engaged in subsistence-level rain-fed agriculture, and 60% of these are food insecure on a year-round basis. The census showed that 45% of the population lives in the south and 42% in the centre, with only 13% living in the north.

The NAPA says: *"Female- and children-headed households, the elderly and women are the most vulnerable [to climate change], a situation that has been exacerbated by increasing poverty and population pressures on a limited land resource base, low economic productivity of the land, labour and capital, and extreme weather events due to climate variability, and low capacity to adapt to the adverse impacts of climate change. These have been compounded by rapid environmental degradation as a result of agricultural expansion to marginal lands and deforestation, inadequate knowledge and skills in the productive use and management of land and natural resources, inadequate access to land and credit, poor health services and gender inequalities".*

The NAPA sums up likely impacts as follows:

Agriculture Malawi relies on rain-fed agriculture, and the most recent droughts have resulted in poor crop yields or total crop failure, leading to serious food shortages, hunger and malnutrition. Flooding has also severely disrupted food production in several districts. The most vulnerable groups are rural communities, especially women, children, female-headed households and the elderly.

Human health Human health is directly affected by climate change, and is especially linked to infant malnutrition and chronic ailments associated with malaria, cholera and diarrhoea as a result of droughts and floods. For example, malaria is expected to increase and spread to previous cool zones as temperatures increase due to global warming.

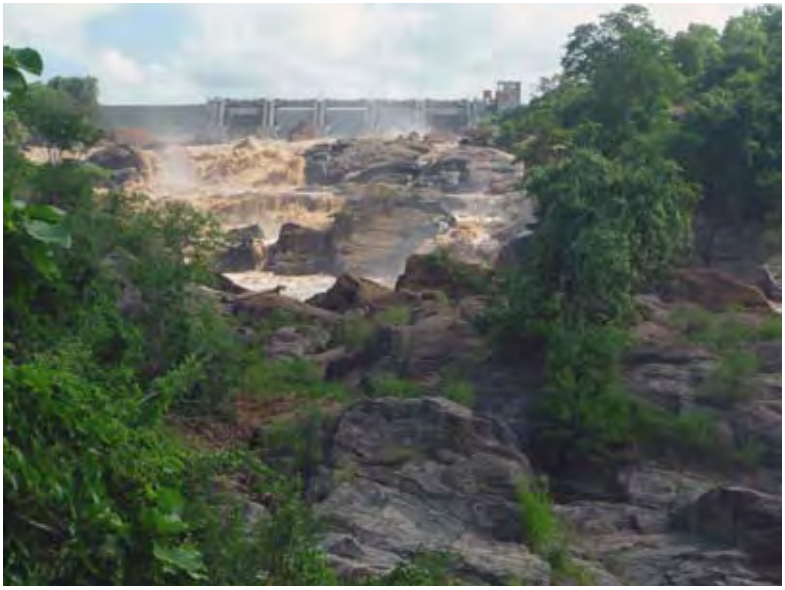
Water Water is a critical resource for human and industrial use, and for the maintenance of ecosystems. Increasing droughts and floods seriously disrupt water availability, in both quantity and quality.

Forestry The major climatic hazards that threaten the forestry sector are extended droughts, which lead to land degradation and loss of soil fertility, as well as forest fires.

Energy The country's energy is mainly hydroelectricity from the Shire River. The droughts and floods have negatively affected hydroelectric power generation. The water flow disruptions in rivers have also been exacerbated by siltation caused by poor and unsustainable agricultural practices, deforestation, and noxious weeds, such as water hyacinth.

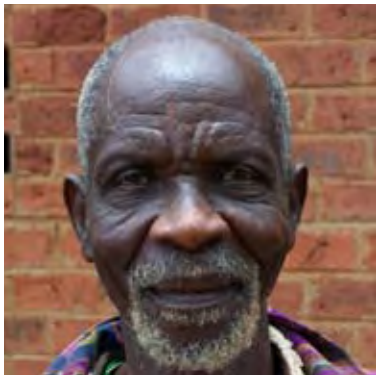
Fisheries Droughts and floods are the major climatic hazards affecting the fisheries sector, and have been responsible for the declining, or even drying up, of water bodies resulting in low fish production and loss of biodiversity. Floods have been responsible for the destruction of fish ponds, such as in 2000/01, while droughts have been responsible for the regular drying of shallow lakes such as Lake Chilwa, which dried completely in 1995, although it has since recovered.

Gender Women's activities are most impacted by an adverse climate, including the collection of water, firewood and ensuring daily access to food. In addition, the changing demographics as a result of the impacts of the HIV and AIDS epidemic, are leading to women taking up greater responsibilities as sole heads of households and taking care of the sick and orphans.



A hydroelectric dam seen from the Kapichira Falls, Shire river, Malawi. The country's energy supply is derived mainly from hydroelectricity. However, the droughts and floods have negatively affected hydroelectric power generation.
Photo: Jerry Kent

Changes to the winds and rains: what people say In different places people have come to depend on different wind regimes, according to which wind is prevalent and useful for particular crops.



Left: Enless Nakhuba, 65, from Thomasi village in Thyolo, and middle, her neigbour Peter Chapasi, 76. Right: Peter Shonga, 59, from the Mzimba district.

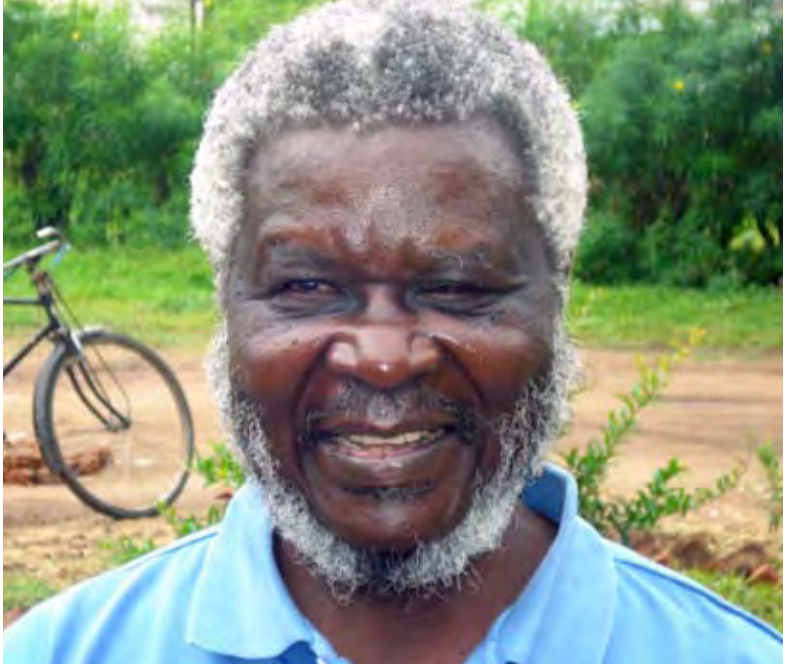
As observed earlier, even villages a few miles apart may have subtly, or even quite markedly, different climatic regimes. Terrain, altitude, the presence of mountains and rain-shadows, the presence of water and so on all affect wind and rain patterns.

Nevertheless, farmers consistently report broadly similar phenomena; that whichever winds they depended upon have changed and the familiar pattern of the seasons seems to be disrupted.

Asked what changes she has seen in the climate in her lifetime, Enless Nakhuba, 65, from Thomasi village in Thyolo, immediately says: *"The air circulation is different from in the past. It has affected our crop production and even the houses where we live. Heavy winds blow away our houses. These heavy winds come from different directions at the same time".*

Her neighbour Peter Chapasi, aged 76, agrees. He says: *"If the pressure of air comes from the south or the north we experience good rains but if from the east or west they are bad. In the past we got very good winds from the north and by 10 October people were doing the planting and we got high yields. But at this time we don't have winds from the right direction, they come from all directions now, resulting in bad yields. We expect rains and they don't come, or we get heavy rains which only destroy and don't help our crop production".* The "deadliest" wind, the villagers here agree, is the east wind.

Wilson Chiphale, aged 86, from Bruce village in Balaka, says: *"The rains for this area used to come from the south or the north and that meant better harvests, but when the rains come from the west those rains are not so good. I have noticed that the rains no longer have a particular pattern. Sometimes they come early when people have not prepared, sometimes they end too soon and maize wilts, sometimes we*



Village Headman, Ebbie Mwakasungula, Karonga.

experience very, very heavy rains that last for up to four days, which washes away all the nutrients".

In northern Malawi people have noticed similar changes. In Mzimba district Peter Shonga, 59, says: *"Previously the rain used to come from here [pointing at the north] or here [pointing at the south] and we would know that such rain was good for our crops. These days it comes from all directions, often heavy and destructive and goes away before the crops are ready."*

In Ntchenachena, Rumphi, Estere Mhango says: *"Originally the first rains would come from the west and when that happens we would know that we would harvest enough. Such rain would occasionally stop for a few days and continue evenly throughout. When the rains came from the east, they would be heavy and tend to destroy a lot of property. These days this pattern is no longer predictable and rains come from all the directions."*

In Karonga, on the other hand, the east rains are favoured and held to be good for maize and rice. However, according to Village Headman Ebbie Mwakasungula, it is increasingly rare to experience the easterly rains: *"Previously the rain used to come from the east but these days when the rain forms in the east, strong winds from the west often crush them."*

The perceptions of people – consistent across the country – are intriguing. Asked for his expert opinion Gray Munthali, Deputy Director of the Malawi Meteorological Service, says strong winds are indeed causing increasing damage to property, and he observes that whereas previous incidences of winds blowing roofs off normally occurred at the beginning of the rainy season as the weather systems established themselves, *"of late winds blow off roofs even in the middle of the season"*. And he observes too how the frequency of floods that are associated with heavy, thundery downpours has also increased.

However, he is cautious about saying that there has been any change either in the wind regime or in the occurrence of heavy downpours. Rather, he ascribes the more devastating impacts witnessed to the fact that the number of trees has decreased, because trees act as windbreaks.

Data showing possible wind changes is uncertain; however, regular meteorological data is inadequate and patchy across most of Africa. Furthermore, climate in Malawi has always been erratic, especially in the contrast between "normal" years and El Nino years. But if what people on the ground are observing and stating is indeed the case, it indicates that climatic systems are already changing in ways consistent with climate change models. This is an important area that urgently requires further scientific research.

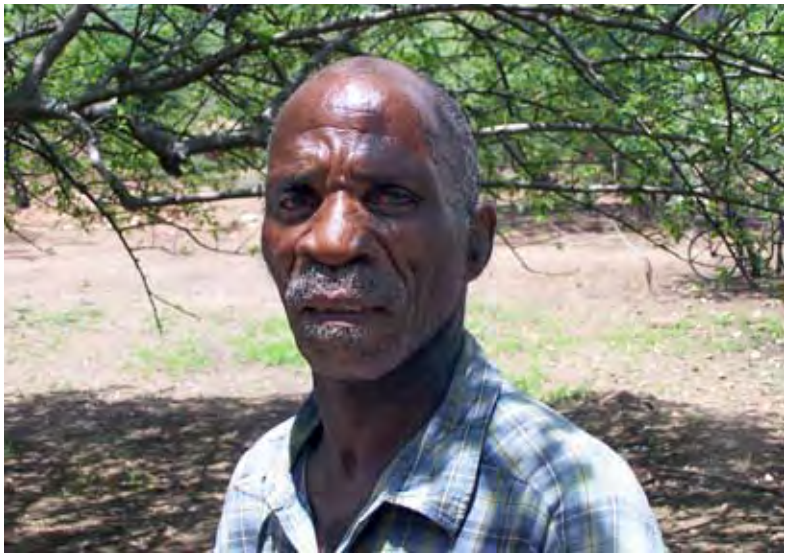
Climate change impacts on agriculture Scientists who have looked at the impact of climatic trends on maize have found evidence that dry spell lengths have been increasing, including in Malawi.

Mark Tadross, Pablo Suarez and associates[9] say their work *"suggests that changes are occurring at the beginning of the season, reinforcing the evidence that the start of consistent rainfall for planting has been getting later".*

Statistically these are weak trends, but for the farmers who depend on rain at the right time and steady rain throughout the growing season, seemingly small changes can easily spell the difference between a good maize harvest and a poor one – or for many, between a harvest that is barely adequate at best, and no harvest at all. Furthermore, climatic problems interact with environmental ones, notably deforestation and declining water sources, and each reinforces the other.

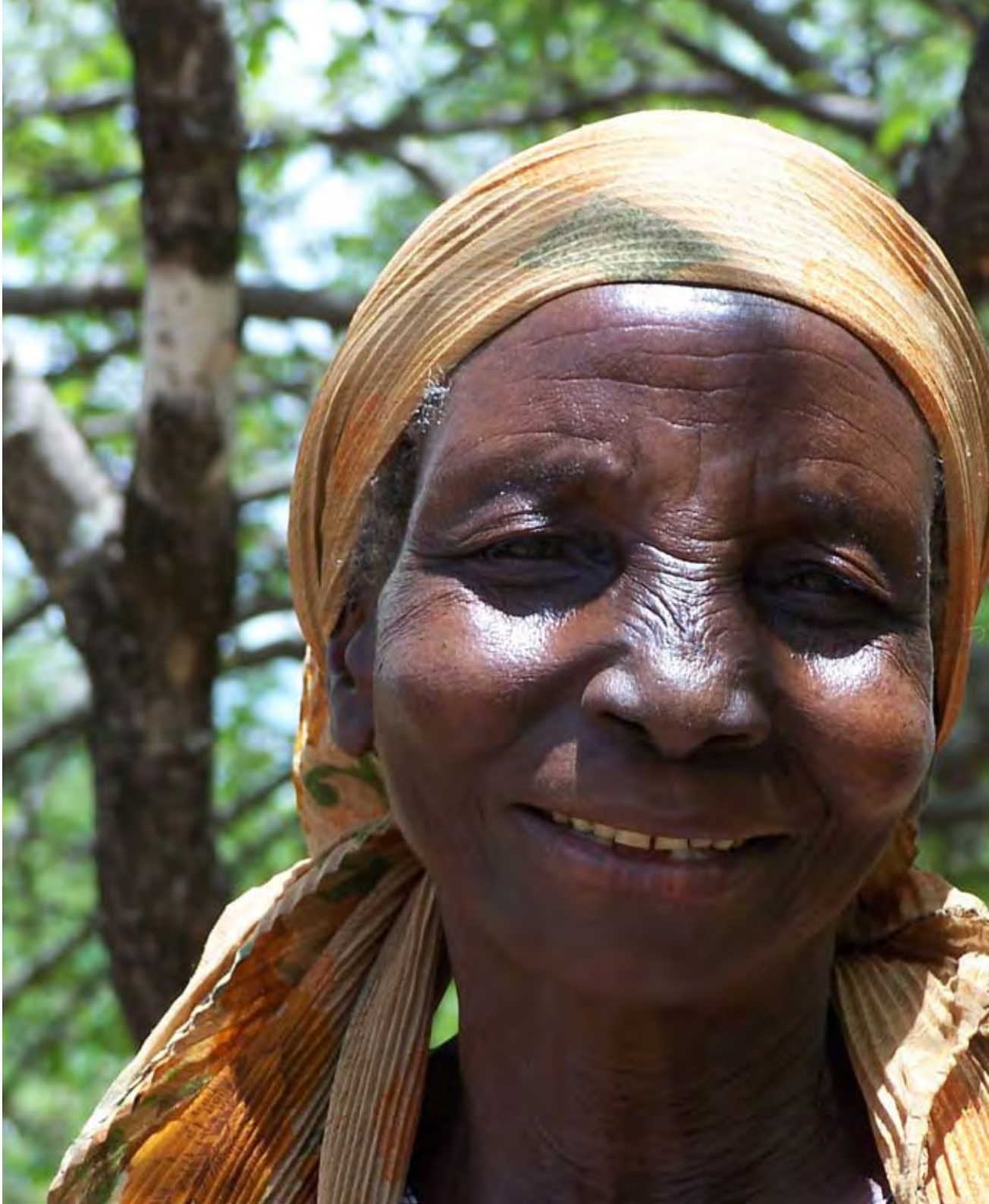
For farmers who rely on maize, especially varieties that take a full three months to mature, these variables create huge problems. Even in the best of times, many farmers only harvest enough to feed themselves and their families for some three to four months. Even when harvests have been excellent on a national level, as in the past two years, there have been many places where the majority of farmers have still not harvested enough to last much longer than usual. The reasons have a lot to do with poverty: lack of land; lack of income to obtain seeds and fertilisers or hire labour; the prevalence of HIV and AIDS, lack of strength and the need to look after orphans; all these and other factors combine to mean that many farmers cannot take full advantage of good rains, and are highly vulnerable to losing their crops when there are droughts or floods.

The effect is to shorten the growing season – and introduce greater uncertainty. Women interviewed at Bwemba village in Malili Traditional Authority (TA) on the outskirts of Lilongwe say that in previous years they would be weeding their growing crops at around Christmas time, but now



Julius Nkatachi of Tsite village. He ascribes the changes to the seasons to population increase which has resulted in widespread deforestation.

Esther Chanache, 69, from Tsite, says: "Now if you miss the first rains it means you're not going to get anything".



they might only be planting at Christmas, or even later. People in Ntchenachena used to identify a clear sequence of four rainfall-events, starting in late September and running through to the beginning of August, one of which – the third - heralded the start of the main rains. Each signalled the start of specific farming or other activities. They say this pattern can no longer be recognised. In Bruce village they say that the days are long gone when the elders would advise the young farmers not to plant when the first rains arrived, but to wait until the fourth rains came and the ground was soft.

Esther Chanache, 69, from Tsite, says: *"Now if you miss the first rains it means you're not going to get anything".*

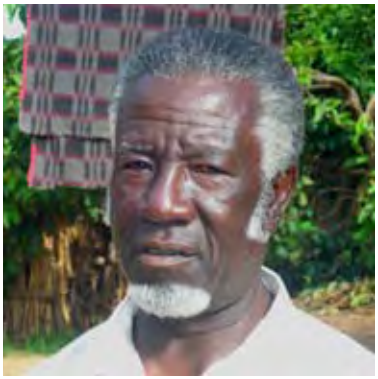
Wyson Timeyo Kaunda, 69, who is the headman for Embisi village in M'mbelwa TA in Mzimba says unpredictable rains have led to perpetual food insecurity in his area: *"Previously we were cultivating local maize varieties which did not require fertilisers and pesticides but now we are advised to plant early yielding hybrid varieties which are expensive to manage as they need fertilisers and pesticides. But even with the hybrid varieties, we are not yielding enough because the rains stop early before the crops mature."*

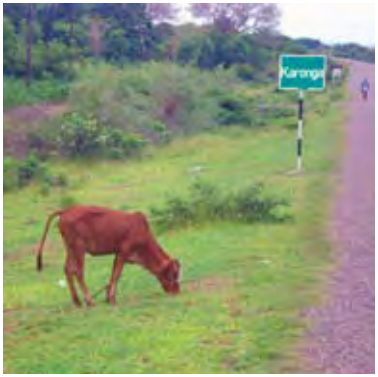
Kestings Sulani, Agricultural Development Officer for the Balaka Livelihoods Food Security Programme of the Blantyre Synod Development Commission, says: *"Farmers cannot rely only on one crop – maize. If that fails then they must have something to fall back on. I've noticed the temperatures getting higher every year since I started work here in 2002, and how where we had running water in shallow wells these are no longer yielding. So we can no longer rely on maize. That's why we promote sweet potatoes and cassava, because they withstand drought better.*

"But it's difficult, because people talk only of maize. They say maize is food, and food is maize. If you take maize, you say you have eaten, and if you take something else you say you haven't eaten. So we have to change this mindset and that's what we are aiming to do in the 87 villages where BSDC works. We could do more, but finance is the limiting factor – irrigation, particularly, is a big investment".

Commercial crops are affected too. Isaac Mwaungulu is the Agricultural Extension Development Coordinator for Ntchenachena Extension Planning Area (EPA) in Rumphi and he attests to this: *"This place was originally producing a lot of coffee because it was experiencing cold weather almost all year round, which was good for coffee production. This area was*

Left: Kestings Sulani, Agricultural Development Officer for the Balaka Livelihoods Food Security Programme of the Blantyre Synod Development Commission. Right: Wyson Timeyo Kaunda, 69, who is the headman for Embisi village in M'mbelwa TA in Mzimba. Bottom left: Isaac Mwaungulu is the Agricultural Extension Development Coordinator for Ntchenachena Extension Planning Area (EPA) in Rumphi. Bottom right: With available grazing pasture in short supply, animals are now tethered at every available pasture, even along the main road so that they can graze.





unsuitable for tobacco but these days the coffee plants are dying and people have now started growing tobacco, which in itself is evidence of climate change."

Mr. Mwaungulu says records in his office show that coffee production in the area has fallen from 400 MT per annum at the beginning of the last decade to between 50 and 60 MT in recent years.

In Karonga district in northern-most Malawi, on the border with Tanzania, villagers are heavily influenced by East African traditions, notably cultivating plantains and keeping beef cattle.

But they complain that their plantain trees are dying, and the pasture is drying up. Monica Mhango, the chairperson for the Coalition Of Women Farmers in Karonga, says: *"People have now resorted to tethering their animals at every available pasture, even along the main road so that they can graze. Previously we would employ herd boys to feed our animals in pasturelands but the pasturelands are dry most of the time. There are also increasing incidences of livestock deaths due to strange diseases."*

One result has been a significant change in the local diet. Only a few people in Karonga now enjoy the traditional dish "mbalagha" that was made of boiled plantains and beef.

For women, the impacts are particularly severe. For example, Esther Chanache from Tsite village says: *"We women have largely been affected in terms of fetching water. Previously the rivers would run all year round but now when the rains stop the rivers dry up. We have to walk long distances.*

"Fortunately for us the government installed a borehole. One side of the village goes one and a half kilometres to get to it, from the other side people walk two and a half kilometres – that's one way. But that borehole covers a big area and many people so we have to queue a long time".

Droughts and deforestation: the experiences of one community

Communities throughout Malawi ascribe changes to their climate, and especially increasing drought, to deforestation, and that is why there is a massive push to plant trees as a remedy.

In community after community tree nurseries are springing up, local governance on cutting trees is being tightened up and when asked what should be done and what extra help do they want, people invariably answer: *"Plant more trees to protect the environment!"*.

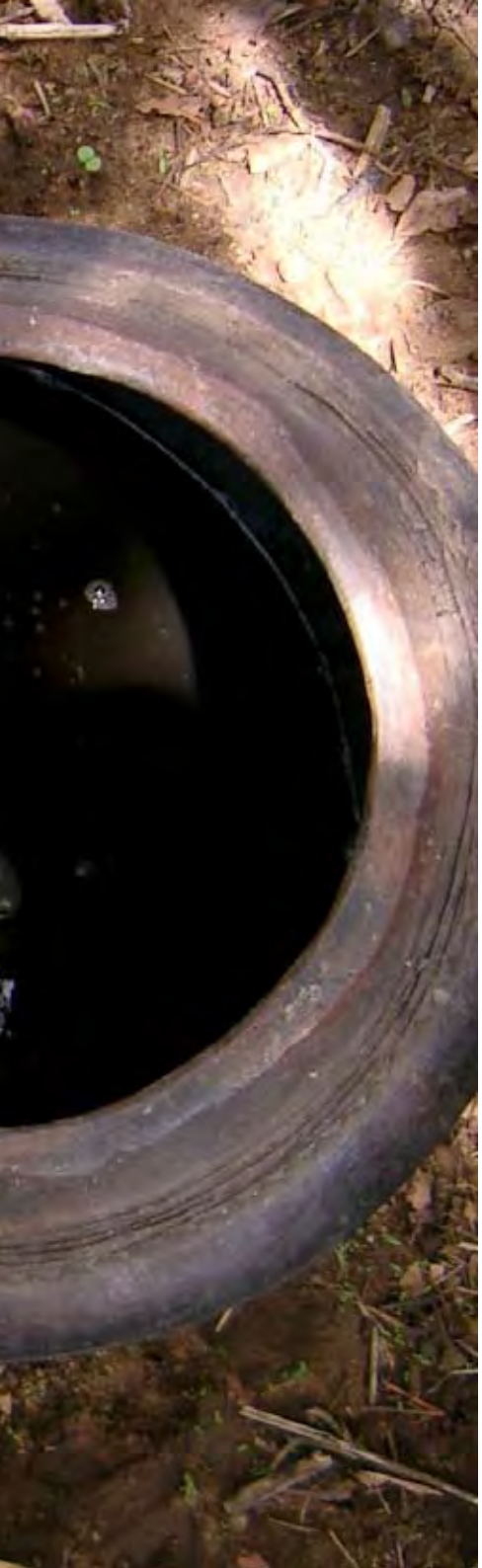
But as one village woman asked Oxfam researchers, *"if we plant all these trees, will that solve the problem?"*. The answer is yes and no at the same time. Planting trees in Malawi will not solve the global problem, but as part of a suite of adaptation practices, it will certainly help people to cope with climate change up to a point. Increasing tree cover is likely to soak up ground water and smooth water flows, thus reducing sudden flooding and reducing soil erosion. And planting trees can also have directly beneficial impacts on climate at a local level, by shading the immediate vicinity, reducing evaporation from the soil, acting as wind breaks, and increasing access to fruits and timber. But the principal cause of climate change is greenhouse gas emissions from industrialised countries, and no amount of tree planting in Malawi will soak up enough carbon from the atmosphere to compensate for that. Ultimately, the root cause of climate change is only likely to be resolved through international action to stop emissions.

Unfortunately, total forest cover in Malawi declined by nearly 13% between 1990 and 2005 and Malawi has an annual deforestation rate of 2.8%, one of the highest in southern Africa. What relatively few carbon emissions Malawi emits come primarily from this burning of trees as fuel. But the burning of trees is, as in many poor societies, key to livelihoods – often the difference between eating and not eating.

Mr Nkatachi of Tsite village, after describing the changes in the seasons mentioned above, goes on:

Cecilia Friday, Ndombole Village Development Committee Chairperson, with tree saplings.

Kalongonda beans at different stages of preparation. Kalongonda beans can withstand severe drought situations and can improve soil fertility. However, these beans are poisonous and if not prepared correctly can kill. They need to be cooked all day with at least seven changes of water - using precious water and firewood. Other famine foods threatened by climate change and environmental pressures include Matano (a wild fruit chewed like gum), Chenje (a bitter berry), Tsukamano (a semi-sweet berry), Bwemba (a very sour, acidic fruit, crushed and mixed with ash to neutralise the acid), Mphunga (a grass seed that makes a tasteless porridge), Chitembe (a sour fruit that is pounded into a flour) and the Mpinjipinji (a sour fruit). Photo credit: Jane Beesley/Oxfam



"We blame these changes on the population increase. This area used to be thick forest, now it's been cleared. Almost every piece of land has been settled on and people have cut trees wantonly. The River Lisongwe used to be wet all year round because trees surrounded it. People have cut them, the soil is being eroded and we can't grow crops in the dry season because we can't get water from the river".

But Mr Nkatachi and millions of people like him are in a trap. The very reduction in water levels, and the lack of any formal employment or other alternative, means that he too – he admits - has to cut down trees to sell as firewood or to make charcoal.

In Kaliyati village outside Blantyre a group of elderly women and men described the fruits and berries that used to be plentiful and within easy distance. Most were however, unpalatable and required special cooking, but sustained life in hard times. Alice Kamowa, who was born around 1936, says: *"I cannot get wild fruits anymore because there are no trees so now I must wait for my children to give me food. Even the grass we could once eat in an emergency does not grow here anymore because there is not enough rain".*

The main reason for deforestation is to make charcoal. The impacts have been tremendous and relatively sudden. In 1981 wild fruit and berries were available just a few minutes walk away. Today the forest is seven hours away, well beyond the Shire River. Now, the village Headman who owns all the land surrounding Kaliyati has placed a ban on tree cutting there.

Drought in Kaliyati village	**Walking distance to forest**	**Coping Strategy**
c.1900	Few minutes	Wild fruit and berries
1922	Few minutes	Wild fruit and berries
1949	Few minutes	Wild fruit and berries
1981	Five to ten minutes	Wild fruit and berries
1992	One hour	Aloe Flowers
2002	Two Hours	Selling Charcoal
2006	Four Hours	Selling Charcoal
2008	Seven Hours	Selling Charcoal

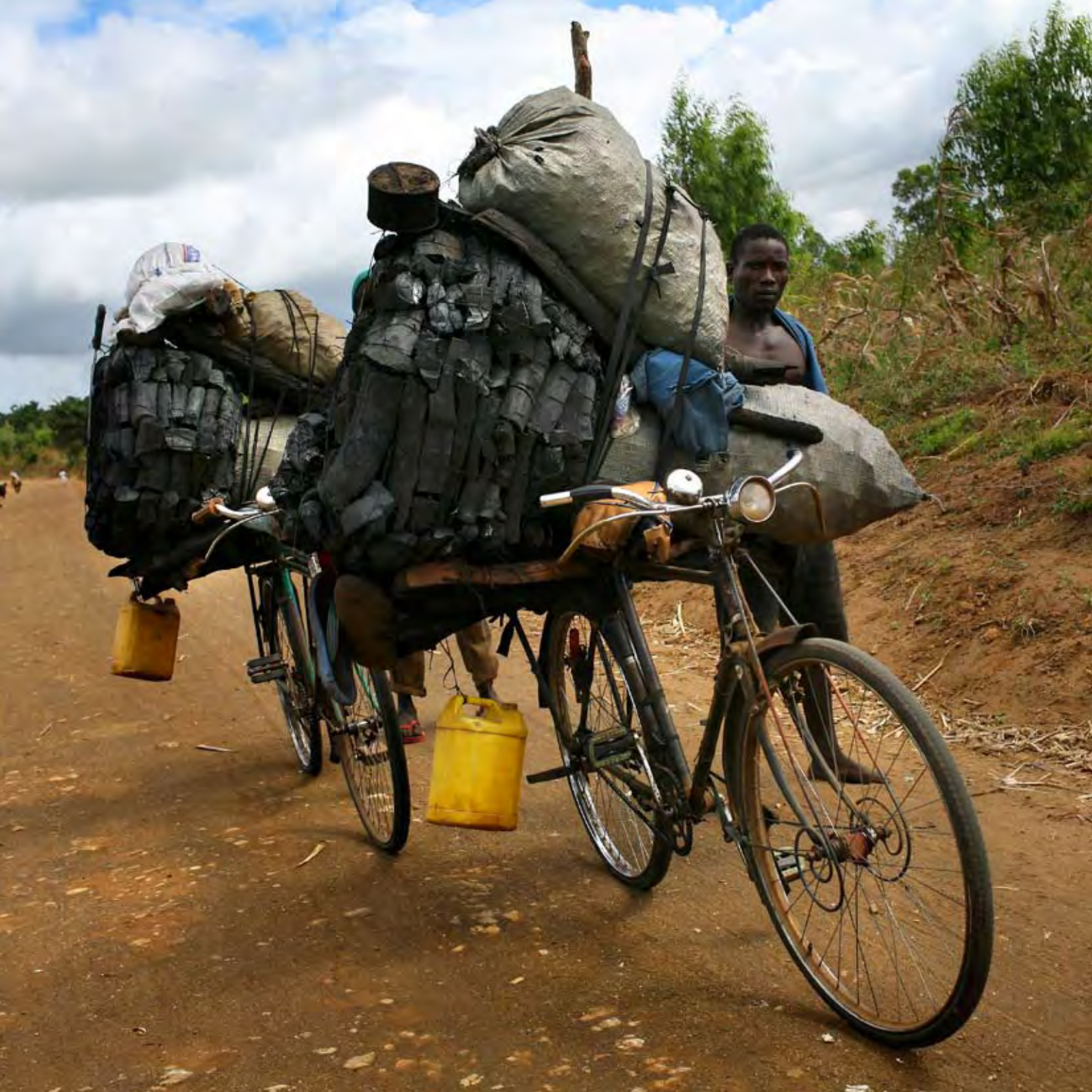
The need for charcoal Journalist Alex Renton visited Malawi for Oxfam in June 2007 and reported the following encounter:

"The charcoal-selling trade around the town of Blantyre, where most natural forest has gone, is one of the most visible illustrations of the problems. It is illegal to cut down trees in the parks around the town, and in the forest reserves outside it. Yet fuel is crucial – winters are chilly here and food must be cooked every day.

"One day we saw an extraordinary sight. Coming down the dust track out of the heat-blurred distance we saw bicycles piled impossibly high with bundles. As they got closer we saw that each one was pushed by a man almost bent double to get the load up the hill. They stopped for a moment and told us how they'd been pushing the bikes for two days, all the way from the forest of Mwanza, 40 miles away on the Mozambique border.

"That's the only forest that's left and that's safe for us. People cut down trees there, and make them into charcoal – we buy this load for 600 kwacha (£2) and we sell it in Blantyre for 1900 [£6.30 – the prices are as recorded in June 2007]," said one of the men. Down his face rivulets of sweat cut through the charcoal dust on his face. "It's hard work, but there's no other jobs. And I have a family to feed in Blantyre." As they talked they kept glancing up and down the road. If the police stop them, their bicycles and loads will be confiscated and they will be jailed for a week. It's a weary way to make a living".

Charcoal sellers have walked 60km to buy the charcoal to sell at the market in Blantyre. There is so much deforestation in the area that traders are having to travel further to find wood. Photo: Abbie Trayler-Smith/Oxfam



Climate change impacts on fisheries: what people say Few people know as much about Lake Malawi as Lincoln W Singini. He has been fascinated by the geography and ecology of the lake for many years and is a foremost expert on its fisheries.

He has studied records of both climate and of catches going back decades. Since 2003 he has been General Manager of Maldeco Fisheries, the biggest commercial fishing operation on the lake, based out of the port of Mangochi.

But he stresses that he is speaking in his personal capacity as an expert on the lake's ecology when he gives his view that he is pessimistic about the entire future for fishing in Lake Malawi.

Lincoln W Singini, General Manager of Maldeco Fisheries.

If conservation measures are not taken seriously, he says, then there is little hope.

Lake Malawi is almost an inland sea, so big that it influences the climate of the entire nation. It is the home of a vast number of fish species, many of them important sources of food, especially of protein. But catches have been steadily declining. The total catch in the 1990s was some 80,000 metric tonnes. Now it is 60-65,000 MT per annum, of which artisanal fishermen catch the great bulk.

The most dramatic decline, and symptomatic of the problems affecting the lake's fisheries as a whole, has been in the "chambo", the best eating fish. In 1993 commercial trawlers caught 2000 MT of chambo. In 2003 they caught 200MT – one tenth of that. And now the commercial catch is not much more than half that.

Mr Singini sees deforestation, the destruction of lakeshore reed beds and over-fishing acting together with rising temperatures to affect the catch.

He explains that climatic influences on the lake are to do primarily with the wind, secondly the rain, and thirdly the temperature. The wind in particular is important because it creates the speed and direction of the waves and the currents and hence the movements of shoals of fish.

Winds affect the currents and as fish swim against the prevailing current, fishermen can track the movement of shoals. The local fishermen cherish the north winds, which are stormy but short-lived. Southeasterly winds are much the best for the commercial fleet. Local fishermen do not do well when the southeasterly winds blow, and the east winds are not good for them either, although big fishing vessels can cope. The west winds are the worst: no good for either the artesanal or commercial fishermen.

Mr Singini says: "*In recent years we have noticed that the winds are not blowing at the times we expect them to blow, and they are inconsistent. Now we get fewer northerly winds and more east and west winds, strong and for quite*

Martin Chiumia, from the village of Msaka, next to the fish racks, where the usipa are laid out to dry.

defined periods, and these are the types of winds we don't like for fishing at all. And when there is a mix of west and east winds that means no defined currents and in this case, the fish are in the doldrums, they go to the shore or they go to the bottom and we can't catch them."

Local artisanal fishermen back up these observations. In the village of Msaka Martin Chiumia and his friend Isaac Kaunda have brought in a good catch of usipa, a small fish like whitebait. Great silver swathes of usipa are drying in the sun on raised woven mats, their pungent odour filling the air. The day's fishing is over and hordes of children are in the water, jumping off the boats, being hauled back aboard and jumping off again with delighted screams. It is a happy scene but Martin and Isaac are worried about the future.

They say the last really consistently good winds were in 2005. For the last 10 or more years the winds have been oddly erratic.

Martin says: "*Previously the winds were predictable, we would know them. But these years, they are unpredictable. The south-east wind in particular, would only come in the cold months from June or July to August but now it blows even in October or even in February".*

Then there is the rainfall. Mr Singini says: *"I looked at all the numbers from a decade ago to the present, and the rains are getting erratic and we are getting less overall, maybe 10-15% less".* This is important because less rain means less mixing of the lake waters and fewer nutrients are brought up that serve as food for fish – resulting in fewer fish to catch.

The final influence on the lake's fisheries is the temperature. Temperatures are much higher than they used to be. As a result, lake levels drop more quickly through evaporation.

At the same time the lake is being depleted by over-fishing, and particularly, says Mr Singini, fishing by local fishermen in Area A. This is the breeding area that is supposed to be permanently closed, but he says there is a lack of capacity to enforce the regulations.

In Msaka Martin Chiumia says: *"We catch much less fish now. We used to catch them close to the shore, now we have to go into deeper water and use a lot of fuel and what we get doesn't always pay for the cost. The reason is the rising number of boats. Lots of settlers have moved in from elsewhere and over time their children have been born, and there are no alternative sources of income".*

Isaac – who himself came from northern Malawi - agrees; he says less than a third of the fishing community have gardens so most must fish to sell to buy maize. When the catch is bad they go hungry.

So is it not possible for the community to voluntarily reduce the number of boats on the lake? Martin sadly says no. *"It cannot happen. Whoever has a boat has his own needs to satisfy. No-one has control over the lake".*

Mr Singini's has three suggestions to solve the crisis. Firstly, enforce fishing regulations to allow the fish to breed, which must also mean finding alternative livelihoods for fishing communities for at least parts of the year. Second, stop deforestation. And third, be serious about conservation. In particular, he wants to see the reed beds and wetlands around the lakeshores preserved and restored. These are crucial areas for young fish to hide, to feed and to breed.

But the spread of tourist villas means the reed beds continue to be removed, hence his pessimism about the future. Aquaculture, he says, will not be able to fill the gap if fish populations crash, *"and it will not solve the problem of poverty".*

To cultivate chambo in cages in the lake is an expensive business and will inevitably be reflected in the sale price, so poor people will not be able to afford the farmed fish.

Floods: the counterpart to drought While farmers speak of drought caused by rising temperatures and longer hot, dry spells, they also face the opposite threat – an increasing number of floods.

According to a report by ActionAid[10], the number of districts affected by flooding, and the numbers of people affected, has steadily increased. Before 2001 only nine districts were classified as flood-prone. In 2001, 16 were affected, and a further 14 in 2002. By the end of January 2003 there was localised flooding in 22 districts.

Floods have always occurred in the south of Malawi along the Shire River and its tributaries and in districts such as Nsanje where ActionAid conducted its interviews with the likes of Lemisoni Ambulesi, aged 70, who had a close encounter with death in the floods of January 2006: *"The floods of over knee height carried me for about 900 metres. I am lucky to be alive and I can say that the floods in recent years have increased in frequency and intensity as compared to when I was a young man".* Floods like these wreck farmer's crops and livelihoods.

The paradox, however, is that floods in the Shire valley that drains from the southern end of Lake Malawi have become more frequent and more persistent over the last decade, yet according to Mr Singini's observations there has been less rain over the lake, and higher evaporation rates. Why is this?

Mr Singini's explanation illustrates the interaction of climatic shocks with the pressures on Malawi's environment. He says: "*The first reason is that the hills around the lake are bare and the trees have been cut, so the water rushes into the lake suddenly and the lake fills up rapidly and fills the floodplain of the Shire river.*

"The second reason is that the previously weedy and reedy areas all around the lake shore have been cut down for lakeside developments for tourism. Those reeds used to hold the water coming off the hills but no longer. The balance of water in and water out has been thrown out".

This explanation may well hold true for the Shire valley but it cannot necessarily account for the increase in floods in other parts of Malawi. People in Karonga in the north say that areas that were not normally flood prone are now being submerged in water when the rains are heavy. Village Headman Ebbie Mwakasungula says this has led to increases in cholera. He says: "*Previously water would flood mainly at the peak of the rainfall season from February onwards and mainly along the river banks. These days floods affect even villages and occur anytime during the rainy season. Previously people would relocate to higher grounds during the rainy season to avoid floods but these days even people settled in areas considered higher ground are also affected by floods."* Increased flooding in the centre and north of the country may be the result of more intense rainfall as well as of deforestation.

Isaac Kaunda, a local artisanal fisherman in the village of Msaka.

Climate change connections to HIV and AIDS It is estimated that somewhere between 800,000 and one million people in Malawi are living with HIV. There were about 70,000 AIDS – related deaths in 2007.

An estimated 20,000 children are born each year with HIV, and some half a million children are orphans due to HIV and AIDS[11]. HIV and AIDS are having a debilitating effect on Malawi society, and the disease is connected to both climatic shocks and to poverty in insidious but direct ways.

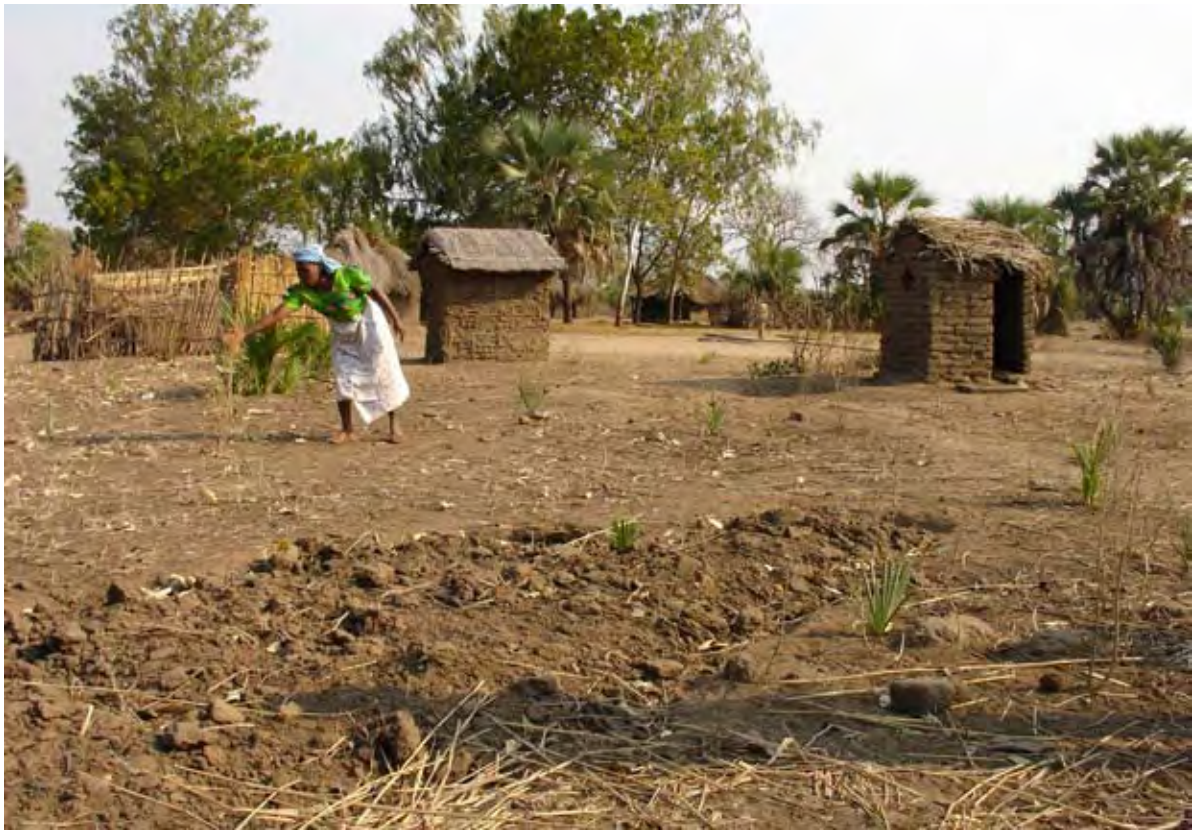
In mid - 2008, Anna Taylor of the Stockholm Environment Institute, interviewed women in Bwemba village on the outskirts of Lilongwe. They explained that they only do rainfed agriculture as the plots they rent are often quite far away and because of this and lack of equipment, they do not utilise irrigation. Poor rains lead directly to poor nutrition and to lack of income. In these circumstances men will often leave the house and only come back when there is food there again. Women may well have little option but to resort to prostitution in order to get income to feed their children. In Bwemba, the women estimate that in between five and seven out of every 10 households the woman might resort to selling sex for food during the critical months of December to February. Such a ratio is exceptional, because Bwemba is near the city and has many bars. However, similar transactions take place elsewhere – and not only because of poverty. The abuse of women and girls by men and boys, often men and boys in positions of authority, is unfortunately common.

Jacqueline Ng'ambi is a Project Assistant for the Maphunziro Foundation that works on HIV. She explains: *"Girls are forced sometimes to marry younger than 14. Some are impregnated by schoolteachers, some are forced to get married so the in-laws will bring bread and butter to their homes, others marry because of peer pressure. Especially when harvests are not good, these problems arise as girls [are used to] generate income".*

These actions feed the growth in HIV and AIDS. The spread of HIV in turn leads to further poverty and greater need to resort to desperate measures: many women are left looking after large numbers of AIDS orphans; HIV-positive people are not strong enough to cultivate their land effectively, still less construct contour ridges and such like to improve it, so that their land becomes increasingly infertile. Yet the nutritional requirements of people living with HIV and AIDS are higher: up to 15% greater for protein and 50% greater for energy according to a study by Pablo Suarez[12].

On a national level HIV weakens the ability to implement progressive programmes intended to improve human wellbeing – including combating HIV and AIDS. It is a vicious circle. For example, a new Oxfam report[13] points out that 25-30% of health professionals will die of AIDS in the next decade.

Suarez points out[14] how HIV poses a major challenge to institutions that must deal with climate change adaptation. "*Institutions dealing with disaster preparedness and response in Southern Africa are facing two enormous challenges: climate change, and HIV and AIDS. A changing climate is expected to increase the risk of disasters and consequently the demand for services that those institutions provide. Yet the HIV and AIDS pandemic may be profoundly eroding the ability of institutions to meet such demand. Indeed, the disease is having devastating effects on the social and institutional fabric of the region. From planning processes in central government to*



Mary Sande on a small plot of land she has started to prepare. Chikwawa in the Lower Shire in Southern Malawi is an area at risk from drought and floods. Most of the people in this district have experienced poor harvests because of a lack of rain, a situation also made worse by the impact on families of HIV and AIDS. Many children are not able to continue with school because cash crop failure and sickness prevents families from finding water and food easily, causing them to have to walk for long distances to find it. Photo: Jane Beesley/ Oxfam, 2005.

agricultural extension programs at village level, a multiplicity of tasks may not be completed appropriately because of death, disease-related absenteeism, increases in workload, low morale, loss of institutional memory and other undesirable mechanisms that weaken institutional capacity".

Women in Bwemba say "adaptation" should include help caring for orphans. Then they would have more time and energy to cultivate their gardens and implement soil and water conservation. To Jacqueline of the Maphunziro Foundation, the answers will ultimately come through the education and empowerment of girls and women to become assertive *"so that when boys or men propose to them they know how to say no in a concrete way – no means no".*

Fred Kabambe stands beside his crop of maize – eight feet tall – and he has already harvested three bags.

Adapting to climate change: farmers see a more sustainable future

Fred Kabambe is a happy man. At a time of year – it is Christmas – when most farmers have not long planted their maize, his plants are already an astonishing eight feet tall - and he has already harvested three bags.

Fred's new-found ability to grow more maize seems phenomenal; in previous years he says he only harvested one bag – and in some years only half a bag. Last year, he harvested no less than eight bags of maize and this year, even if the rains prove to be not so good, he expects to beat that. On top of his three bags already full he says he will get a second harvest in January, and then a third at the main harvest in April.

He is growing an improved variety of maize, but the secret of his success is not based on that alone. Rather, it is by doing a combination of things which, when implemented together, could drastically reduce the fear of hunger from climate shocks for farmers like himself.

Fred, aged 28, says: *"I established this garden because of climate change problems. Now I can have food throughout the year and a source of income too".*

He obtained the early maturing, high-yielding maize seeds from Churches Action on Relief and Development (CARD). But his success is in growing the seeds in such a way that they fulfil their potential. One change is that he is making proper compost manure. He takes the old maize stalks, chops them finely and puts them in a pit with soil and dung from the goats that he also received from CARD. He mixes it all with water, and in three months the manure is ready and can be used.

The second technique is even simpler, but it turns the entire way that farmers generally do things upside down. Instead of planting the maize on the ridges as almost everyone else does, he plants in the furrows. This conserves moisture during droughts. He planted his first seeds on 1st September, three months before the rains, and watered them every day until he harvested three bags. An argument advanced for planting on ridges is that the seedlings and young plants cannot become waterlogged if there are heavy rains, so in solving one problem, is Fred's planting in the furrows only making him vulnerable to another? Fred says no; he says that by the application of plenty of his homemade compost manure, the soil structure is improved so that it retains moisture during dry times but also drains well when the rains come.

Fred says his eight bags last year earned him enough income to put a tin roof on his house and this year he aims to finish the building work. His wife and children are, he says, very happy and he says: *"Now more people are following these methods. I feel very great!".*

Nor is this all, because a portion of Fred's seeds will go into a newly built grain bank, along with seeds from fellow farmers who have joined the same scheme. Next year these seeds will be distributed to other people in Thomasi, the village where Fred lives in Thyolo.

Such techniques are particularly important in places like Thyolo where not only is population high but land shortages are exacerbated by the existence of huge tea estates. The tea estates provide much employment and export earnings for the nation, but they also occupy large areas of fertile land.

Fred is not the only pioneering farmer in the village either. His parents Moson and Annie have set up one of numerous tree nurseries in Thomasi and the villagers have

Top left: A portion of Fred Kabambe's seeds will go into a newly built grain bank. Right: Moson and Annie with their tree seedlings. Bottom left: TA Kapiche, whose community is farming fish. Right: Estella Saka proudly displays the message on her T-shirt.

also built a large hut specially to grow mushrooms.

Previously they picked mushrooms that sprouted in the bush after the rains, but they hope that cultivation will provide them with the fungi all year round. Mushrooms are nutritious and said to boost the immune systems of those living with HIV and AIDS.

These impressive efforts are typical of hundreds of villages across Malawi.

Villagers are refusing to be held hostage by a fickle climate and are keen to combine the best products of modern scientific crop breeding and new skills with the revival of old techniques – planting on flat land, for example, was a common practice before planting on ridges was heavily promoted. According to Khumbo Kananga of the organisation CURE - Coordination Union for the Rehabilitation of the Environment -, maize grown in furrows – and with compost - survives two to three weeks longer than maize planted on ridges in drought conditions. The secret of success though is not in any one technique but in the combination.

In other villages people are building small dams to hold irrigation water, creating fishponds, establishing tree nurseries, learning to graft fruit trees and diversifying from maize into such crops as cassava, sweet potatoes, groundnuts, mushrooms and more.

In Ndombole village in Thyolo, meantime, Estella Saka, a project assistant with CARD, is addressing a group of villagers who are proud of the tree nursery they have established. They enumerate the Latin names of the varieties and the particular properties of each type of tree – the wood is especially in demand for building houses. Estella urges them to keep going. There is much laughter and clapping. For a finale, she twirls around to show them the message on the back of her T-shirt: "Take Part in Conservation, Prevent Climate Change". There is an enthusiastic round of applause.

Another example of helping smallholders to diversify from only relying on maize is in the Shire Highlands. Thomas Bwanali of Shire Highlands Milk Producers Association (SHMPA), which is an NGO working with Oxfam to help small scale dairy farmers produce and market their wares, told Alex Renton about his friends attitudes to climate change:

"We have a word for it – it's" chilala". It means the warming of the earth. And of course people see that changes have come; but they don't really link them to the global issue. People hear about things on the radio, and they have knowledge of El Nino, but they don't understand how these things are linked up. The government says that if you cut down trees and don't plant new ones there will be a dry spell. People hear it, but if they have no other source of firewood what can they do?

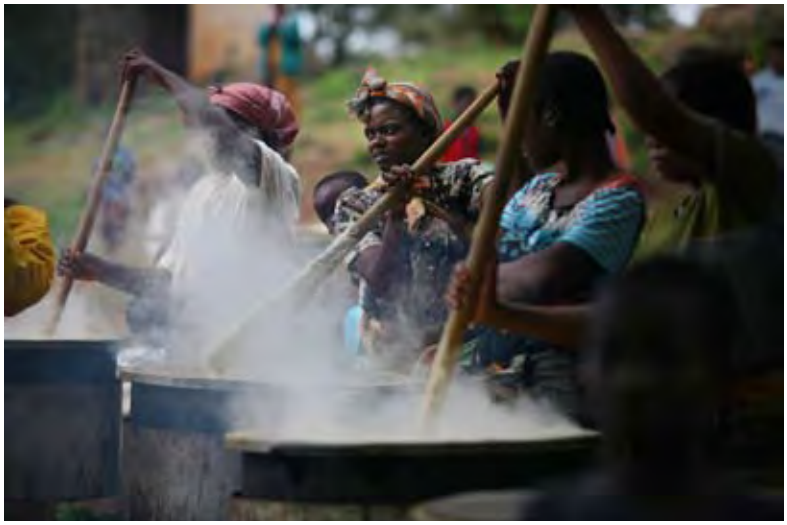
I have a neighbour whose daughter was selected for secondary school: he needs to find 1500 kwacha to pay the fees. He has no money, so he cuts down a tree, turns it into charcoal and sells it in town. How can I tell him that's a wrong thing to do?"

One of the strategies to address the expected rise in increased climate problems is to help smallholders diversify. Owning a dairy cow or two is one idea – and SHMPA and Oxfam also help find an outlet for the milk.

At Chisawani school, outside Blantyre 1900 children get a daily meal of porridge free. The porridge is made from milk supplied by SHMPA. The farmers get a better price for the milk than they might from a commercial dairy, and the feeding programme helps with school enrolment (children are keen to come to school if they know there's a hot meal there) and it tackles the terrible nutrition problem in Malawi. 50% of primary school children are under-developed physically or mentally.

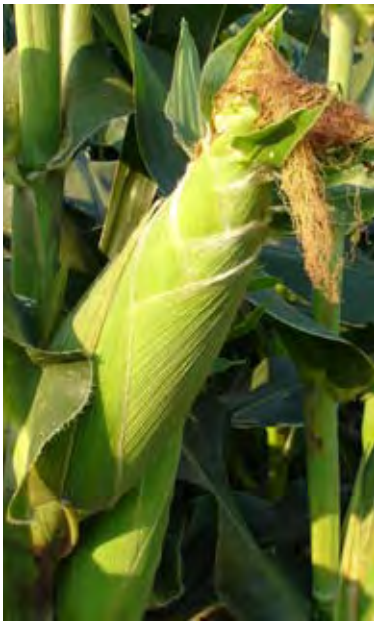
The porridge is cooked by volunteers, most of them the children's mothers, on stoves in the schoolyard. The children wait, excited, each clutching a mug.

The stoves are an eye-opener – a real step forward from the basic design of three stones and some firewood used across Africa. This is the Rocket Stove – manufactured in Malawi and costing about US$200. It's a basic enclosed stove, on which the pot of porridge sits. Any biomass can be used as fuel. According to Martin Mganga, who helps organise the school feeding for the agency Mary's Meals, the stoves are amazingly efficient: *"We need perhaps three sticks for the fire where before we'd have used 10."* The World Food Programme, which feeds some 500,000 school children in Malawi every day, has promised to make sure all the stoves it uses are of similar design and efficiency.



School Feeding Programmes are very important in Malawi: children are keen to come to school if they know a hot meal awaits them. Photo: Abbie Trayler-Smith/Oxfam

Malawi's record maize harvests The newspapers have been hardly able to believe it: Malawi, one of the most food-insecure countries in Africa, has been producing such big harvests of late that it has even become a maize exporter.



An example of healthy green maize at Chitimbe irrigation site. Irrigation has enabled greater production of maize, tomatoes, onions, mustard leaves. Photo: Jane Beesley/ Oxfam

The contrast even over two years was extraordinary. In 2005 drought meant that five million people needed food aid. The 2006 harvest was a record-breaker; the 2007 harvest was a full one-third better than that; and – at the time of writing this report - the 2008 harvest looked good too. Proof, it would seem, of the resilience of the country's farmers who can overcome obstacles if the right policies are in place to help them. Or is it too early to tell?

The weather certainly helped, with good rains in most places in 2005/6 and 2006/7, although in 2007/8 heavy rains flooded farmland in much of the south of the country.

The right policies involved government subsidies – with donor support – and a more efficient distribution system that enabled many more poor farmers to obtain seeds and fertiliser from which some two million households benefited. Fertilisers gave the soils a big boost and the seeds supplied were improved varieties that gave higher yields. Average yields per hectare more than doubled.

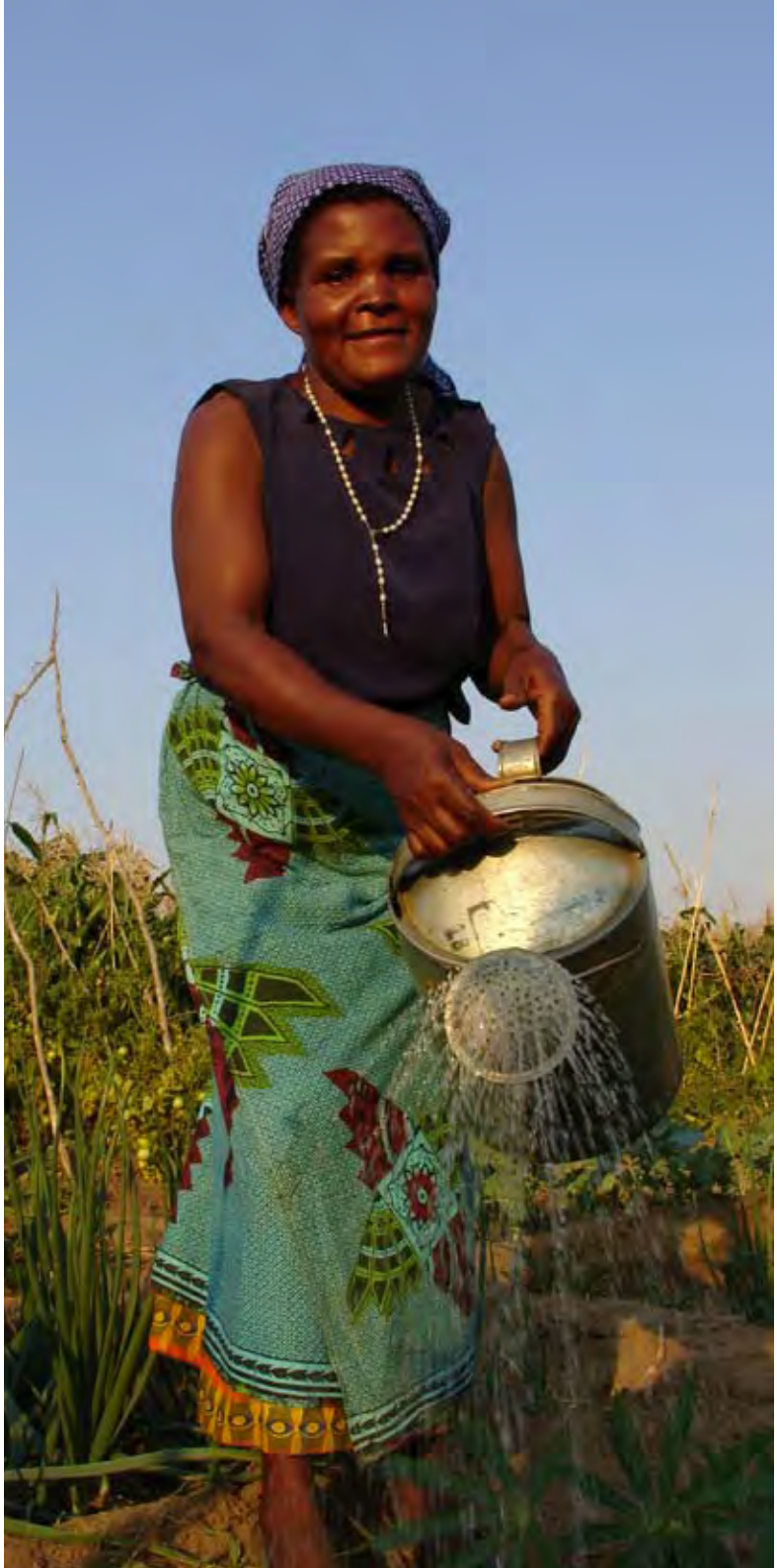
Even so, there were places where communities harvested little; not everyone got the coupons they were entitled to and it was particularly the poorest and weakest inhabitants, notably elderly people and women supporting large numbers of orphaned children, who were less able to take advantage of the opportunity. It was the larger farmers who created the surpluses that the country was then able to export, not the smallholders. And then, in 2008, despite the good harvests and national stockpiles of maize, the price of maize went up to the point where maize in the market was too expensive for many households to buy once their own stocks were exhausted. This was part of a global increase in food prices that had many causes, including an increase in the price of oil (which also upped the cost of chemical fertilisers), conversion of land to biofuels instead of food, and speculation and profiteering in global markets.

In 2007/8 the number of food insecure people in Malawi had decreased to only 63,000, although in early 2009 it had increased to around 600,000[15].

Is the improvement sustainable? The expanded subsidy programme and better distribution network are a huge improvement on what existed before. They are expensive, but they should continue to more than pay for themselves with what

is produced if the harvests are good – and be much cheaper and better than what might have to be put in place if they did not exist, namely a large relief operation to help hungry people. Even so, how long the subsidies continue will always be debated in the context of big unknowns. One such is the weather, especially if there is a particularly severe drought or bad floods one year; and another is the international financial climate.

To continue to reap the benefits of the improved seeds, nitrogen fertiliser is essential, and fertiliser costs are linked to oil. Campaigners for organic agriculture have pointed out that fertilizer costs increased by 65% from 2007 to 2008[16]. If these trends continue chemical fertilisers will become prohibitively expensive. Better seeds are essential, especially in the light of predictions that tropical temperatures will rise considerably during the growing season[17], but better seeds alone will not produce good harvests. The breathing space provided by recent good harvests could be used to develop more resilient agricultural systems, using such techniques as manure/compost made on the farm, irrigation, water harvesting and tree planting. Ultimately, as this report has indicated, over-dependence on maize is risky; there has to be diversification.



Neliya Mukhoma at the Chitimbe irrigation site. A greater diversity and quantity of crops have helped to fend off hunger. Jane Beesley/ Oxfam

Adaptation and development: the connections Ask people how they are adapting to climate change, or what help they need to adapt, and the answers they give usually begin with what seems obvious: for example, increased use of improved seeds that are drought-resistant.

But very quickly, people move on to say that their definition of "adaptation" includes some less obvious strategies. Women might say that they want help to look after HIV/AIDS orphans, without which they do not have the time to spend in the gardens that they need to undertake soil conservation. Young men might plead for vocational training so that they have a better chance of getting a job so that they will no longer need to cut down trees.

At the level of communities, and to the people in them, it therefore seems obvious that "community based adaptation" (CBA) and "community based development" (CBD) are intimately connected. However, organisations that promote adaptation or development, whether governmental or non-governmental, too often start from different premises and go in different directions, neglecting the connections.

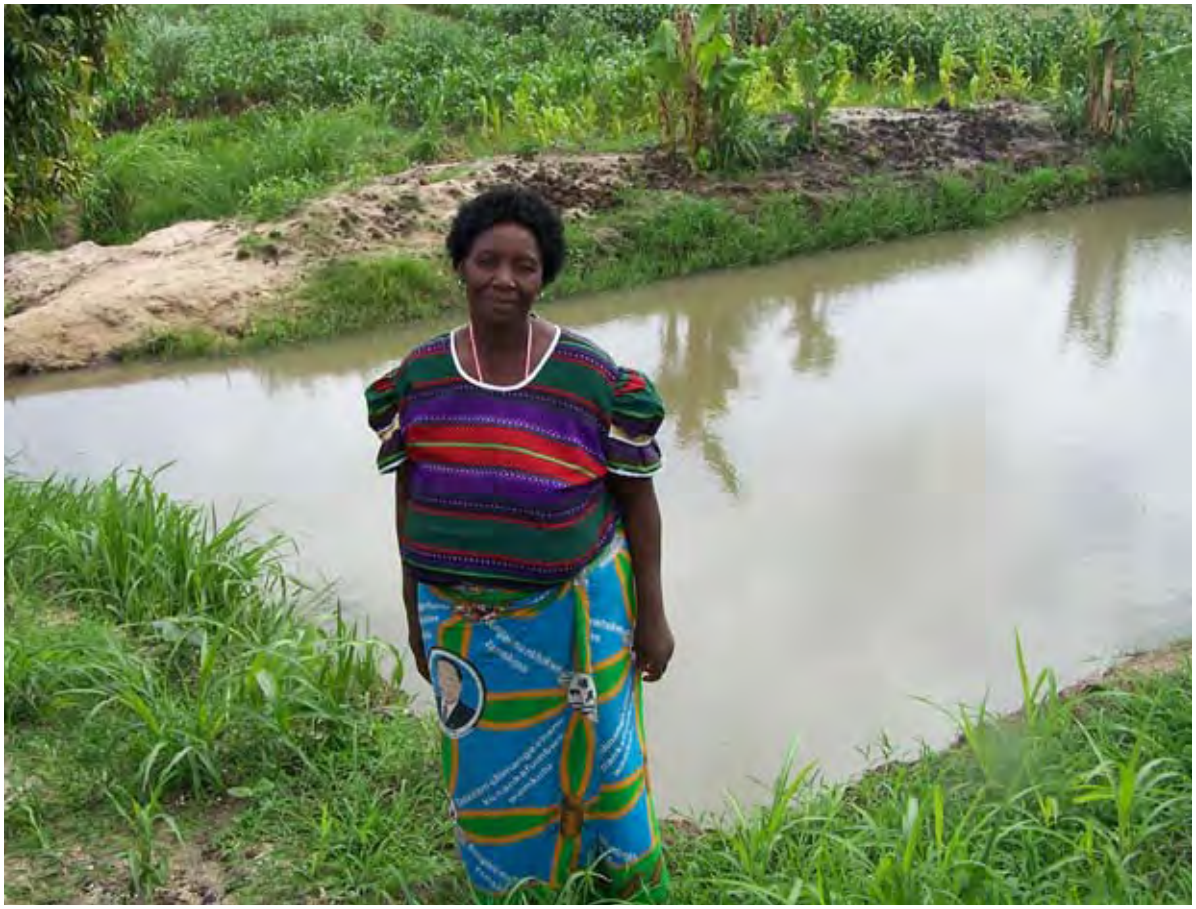
This is partly because "adaptation" – particularly climate change adaptation – and "development" - are so often products of different funding streams as well as different mindsets. In a thoughtful essay[18], authors Rachel Sabates-Wheeler, Tom Mitchell and Frank Ellis say CBA – which is a fairly new concept – too often fails to understand poverty dynamics in communities and is sometimes naïve to assume that livelihood diversification is always the best way to spread risks. CBA focuses on conserving the ecological sustainability of communities; CBD focuses on the assets of individuals and households.

The authors point to the rich history of adaptation in livelihoods that is not restricted to climate factors alone (such as soil and water conservation) and urge ways to *"find synergies between maximising productivity of livelihoods at the same time as maximising the ecological sustainability of the community"*.

Agricultural diversity is an important strategy for sustainability: Malawi, they say, is an example of how over-reliance on a single crop (maize in this case) can lead to greater livelihood insecurity. Diversity in addition to farming, or even out of farming, is important and may be a more climate-resilient strategy. But it is crucial to remember that *"the ability to diversify livelihoods is not wealth neutral"* – that is, the poor cannot diversify as easily or to such advantage as the better-off.

For example, their diversification might well be to do casual, part-time or unskilled work. Wilson Chiphale from Bruce village in Balaka district, who was interviewed for this report, said this was what he did, and then observed: "*When we don't have enough we resort to piece work but by doing that we're recycling hunger, because we're putting our labour into that – helping somebody else – and not doing anything on our own land"*. In such ways, climate change may exacerbate inequalities within communities, making the better off wealthier and the poor, poorer.

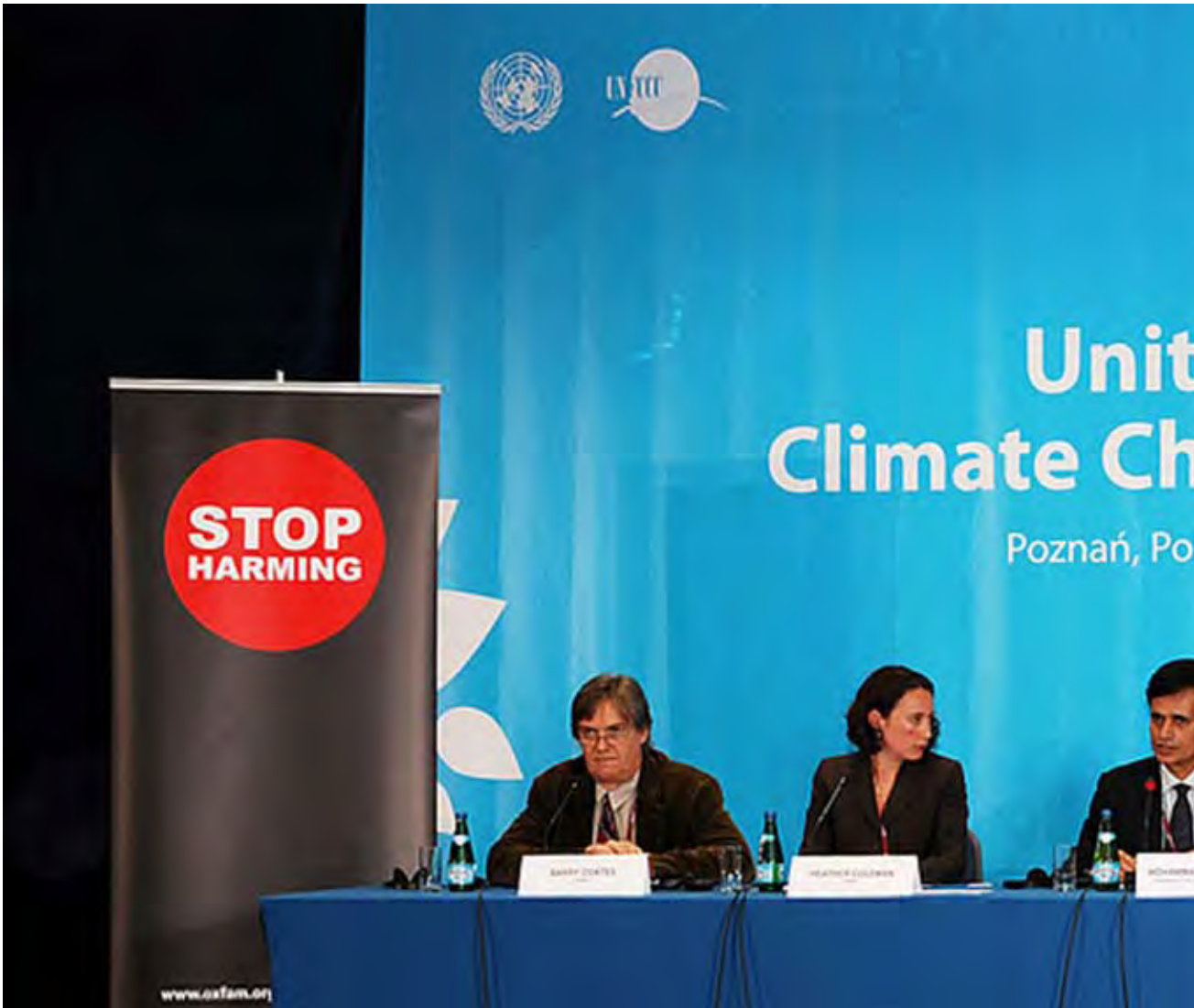
The writers say that *"the more options that there are, and the less dependent such options are on environmental settings that are at high risk of adverse climate change impacts, then the more likely people will be able to adapt to climate change"*. The keys



TA Kapiche, standing next to the fishpond that the local community has constructed.

to being able to pursue options lie in possessing assets such as increased skills, higher levels of education and increased savings (or access to loans) – exactly what ordinary people interviewed for this report said. It is not, however, an understanding that is fully reflected yet in the thinking of many governments, including donors, or climate change adaptation plans, even Malawi's. Furthermore, community-based adaptation – and development – can only work up to a point; ultimately how well it succeeds or fails depends upon the policies and practices of government and other actors.

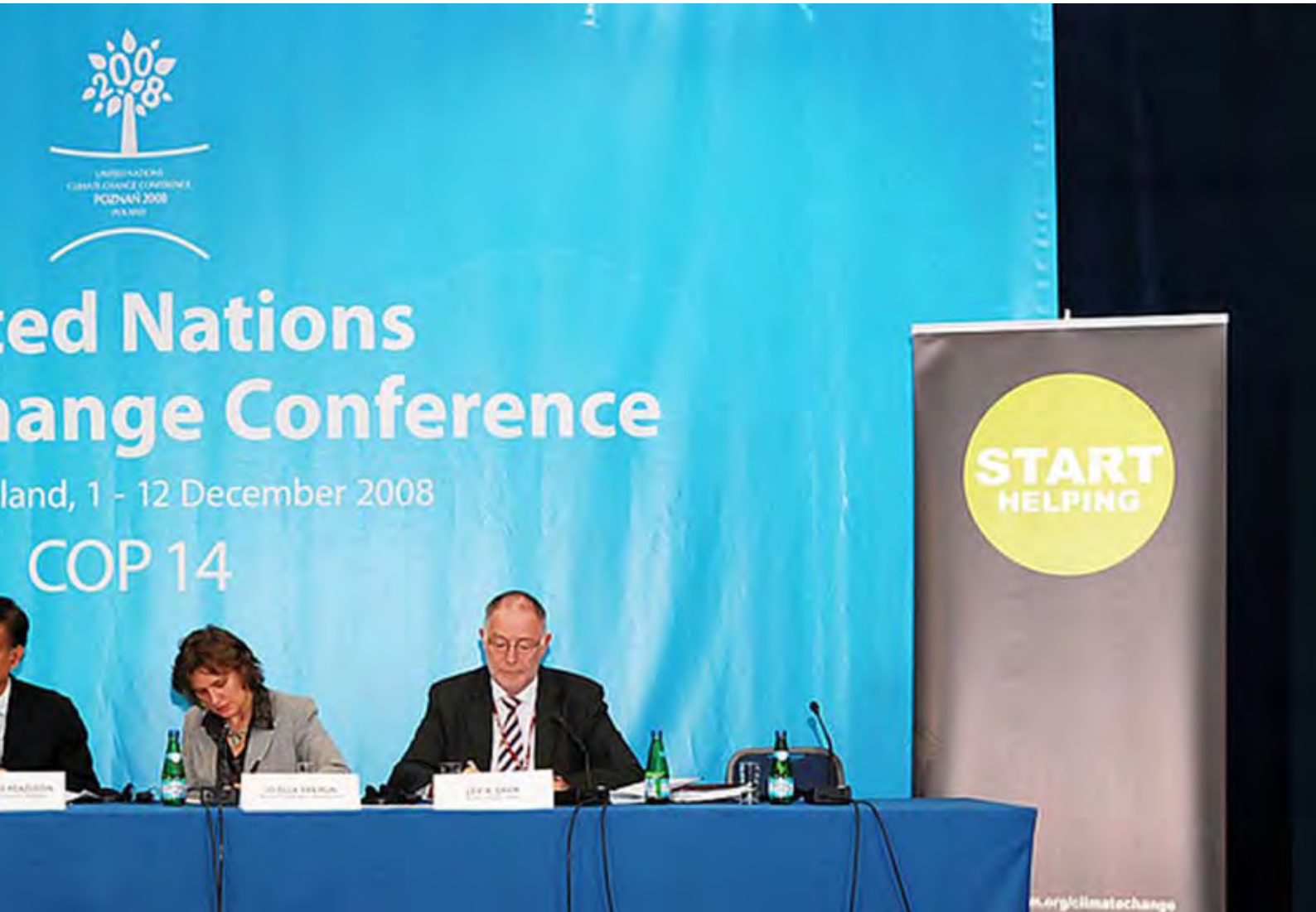
Malawi's NAPA: National Adaptation Programmes of Action As a signatory to the Kyoto Protocol, that puts into operation the United Nations Framework Convention on Climate Change (UNFCCC), Malawi is obliged to report on its greenhouse gas emissions and identify climate change impacts.



Oxfam's press conference at UNFCCC in Poznan, December 2nd, 2008. Oxfam is calling on rich, high-emitting countries to "stop harming" by reducing emissions and "start helping" by funding adaptation.

This it has done through the First National Communication of 2002 and a Second National Communication is reportedly almost ready for publication (early 2009).

As a Least Developed Country (LDC), Malawi has also developed its own National Adaptation Programmes of Action (NAPA). NAPAs provide a way for LDCs to identify priority activities that respond to their "urgent and immediate" needs to adapt to climate change. Even if greenhouse gases are cut drastically in the near future, as they must be, temperatures will continue to rise for some time and climates will continue to change, hence a degree of adaptation will be essential for all societies.



In theory, the activities identified in the NAPAs – being urgent and immediate – should be priorities for funding, and the channel for this funding is via the UNFCCC's Least Developed Country Fund. The money in the LDCF is supposed to be contributed voluntarily by wealthy industrialised nations.

Malawi's NAPA is a document that, if implemented, would go some way to enabling vulnerable rural communities to adapt to the adverse impacts of climate change. To fund it requires US $22.43 million. As this report went to press in February, 2009, no funds had been released. In its first contribution to any multilateral adaptation funds, the US congress made US$10m available for the LDC fund – less than half of the cost of Malawi's NAPA alone (and there are 49 LDCs).

The NAPA identifies five priority activities, which, in order of priority, are:

1 Improving community resilience to climate change through the development of sustainable rural livelihoods, specifically: improving access to water; improving water management through water harvesting, conservation and small-scale irrigation; improving community storage systems for seeds and food reserves; promoting sustainable utilisation of dambos, wetlands and river valleys; diversifying crops and livestock; promoting low-cost nutrition supplements; raising awareness.

2 Restoring forests in the Shire Valley to reduce siltation and associated flow problems, specifically: creating buffers along rivers; planting fast-growing trees; and building community capacity.

3 Improving agricultural production under erratic rains and changing climatic conditions, specifically: improving the choice of crop varieties; improving early warning and climate observational systems; and improving extension services.

4 Improving preparedness to cope with droughts and floods, specifically: conducting rapid assessments and risk maps; designing and testing strategies, policies and laws; preparing drought and flood preparedness plans; integrating climate change plans into land use planning; constructing and rehabilitating dams and other flood mitigation measures; and building multi-purpose dams.

5 Improving climate monitoring for early warning and decision making and the sustainable utilisation of Lake Malawi and lakeshore areas, specifically: enhancing the capacity of monitoring stations; capacity building; developing fish breeding facilities to help restock fish; and developing fish farming.

The NAPA critiqued

Even if the funds requested were released, they would be tiny in relation to Malawi's adaptation needs – less than $2 per head for every person in the country. Making any sort of headway on any one of the priority activities – such as improving community resilience – could easily take up the entire budget. However, the NAPA is only intended to be a start on adaptation, a first step.

With that in mind many Civil Society Organisations in Malawi have put forward constructive criticisms of the NAPA and wider government policy on climate change, with the aim of improving the nation's capacity to respond long term. Organisations like CURE, CEPA (Centre for Environmental Policy and Advocacy), ActionAid and others have also been very critical of the failure of international donors to provide the resources necessary to implement the NAPA.

Among the challenges these organisations have highlighted – along with general capacity constraints due to lack of resources, the HIV and AIDS epidemic and so on – are:

- The true extent of government commitment, given that the NAPA was written by the Environmental Affairs department of the Ministry of Mines, Natural Resources and the Environment in 2006 but not

publicly launched in-country until March, 2008;

- Lack of integration of climate change throughout the key sectors, and the Ministries responsible for them, such as the Treasury (responsible for drawing up the national budget), hence marginalisation of the issue into "the environment" portfolio;
- Lack of awareness of climate change in general and the NAPA in particular among government at all levels and in the population at large, hence lack of involvement and buy-in.

Clement Kalonga formerly of ActionAid and now with Oxfam, is worried that climate change is not getting the governmental priority it deserves.

He says: *"The NAPA has almost become an impediment. The government as a whole is not doing enough; it is waiting for the NAPA to be funded. The government should be more proactive, both in climate change programming and in looking for funds. If asked why they are not doing more, they say "but we have the NAPA and it hasn't been funded yet.*

"But they could get on with co-ordinating various climate change initiatives. The most obvious ones would be to raise awareness and to initiate co-ordination inside the government and with stakeholders throughout Malawian society, especially in the months before Copenhagen [the major UN Climate Change conference scheduled for December 2009].

"For example, make sure that all existing staff like agricultural extension workers – who work with farmers all over the country – and forestry workers, know about climate change - health extension workers in the rural areas too. Then they can begin to translate the climate change issue into language that the people can understand and find ways to bring it into their discussions on farming and community health".

He says that NGOs are doing a lot to support farmers and test and spread best practice, but NGOs cannot substitute for government and government extension workers are critical in supporting climate change adaptation. Unfortunately, there are not enough extension workers. Lack of money, failure to prioritise the sector in budgets and the debilitating impacts of HIV and AIDS are some of the reasons.

Oxfam echoes these concerns, and is also concerned that the activities in the NAPA aimed at creating sustainable rural livelihoods are focused so much on agriculture when smallholder farmers have a wider perspective.

In the Stockholm Environmental Institute study, rural people were asked what they felt would help them to adapt better to climate change. They were often already initiating self-help programmes, notably tree planting, and usually without government assistance, but they saw sustainable rural livelihoods in a much broader context than simply agriculture. This was especially true of women and girls, and young people in general.

They called for help to diversify livelihoods and stimulate employment through vocational schools and training; access to credit and small loans so they could start up small businesses; investment by businesses to provide jobs; assistance in caring for orphans; access to information through rural libraries; free health care and – very commonly – access to family planning services.

Maybin Ng'Ambi of CEPA says communities see it as being difficult to adapt to climate change precisely because there are limited alternative livelihoods, and creating those livelihoods needs to be a major part of a long-term plan to tackle climate change.

What ordinary people in Malawi say is a challenge to some international donors, who tend to see "climate change adaptation" in narrow and technocratic ways: hard infrastructure and quantifiable supplies. It also sees "adaptation" – and paying for it – as an add-on extra to "normal" development processes, rather than running through everything.

A startling, vivid canvas by Malawian artist Innocent Willinga was the centrepiece of a powerful display of paintings at the UN climate change conference at Poznan in Poland.

Innocent was commissioned by Oxfam to illustrate climate change impacts on rural communities. He painted the canvas, which he entitled "Green Future" after spending time in Mzigala village in TA Kunthembwe's area in Blantyre rural.

Before starting to paint Innocent wrote about his impressions from Mzigala, about how people there had to live for today by surviving on ganyu and by cutting down trees for charcoal. It was, he felt, *"a hopeless foggy future for innocent kids"* in the village who had to watch their parents try to survive using methods that would damage the environment for future generations.

But he also felt that the cohesion and community spirit that was apparent in Mzigala gave great hope for a better future.

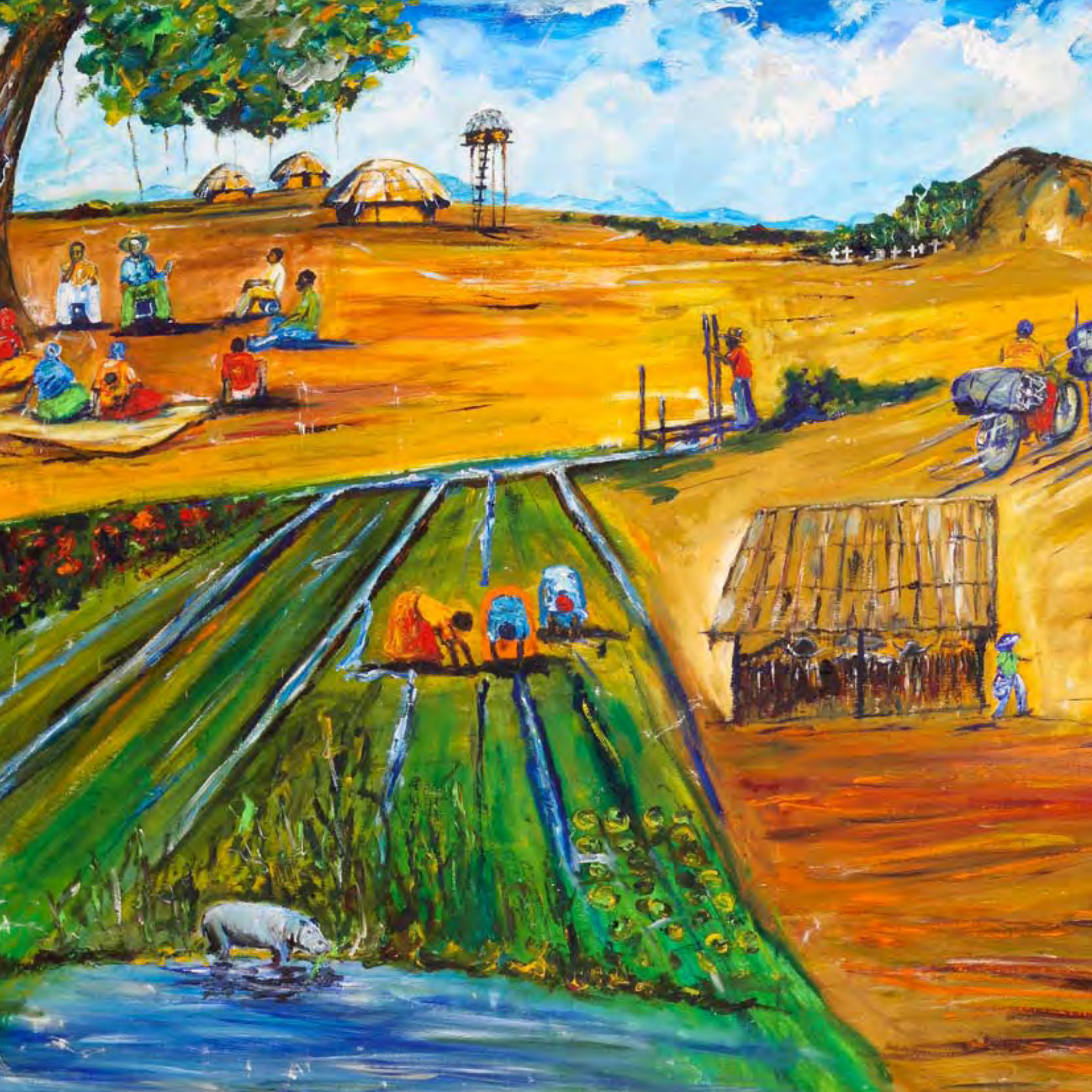
He said: *"Green Future represents a life we can promise ourselves if we can fight together towards rebuilding our ecosystem, a legacy for our kids"*. It will be crucial, he said, for such unity to be replicated at international level.

"Green Future" and the other paintings formed the visual backdrop to Oxfam's call to rich nations to cut emissions of greenhouse gases at the Poznan conference in December, 2008.

In Malawi, Oxfam and CARD used the canvas to mobilise people of TA Kapichi in Thyolo District to reflect on climate change issues. Innocent worked with school children from Khonjeni Primary School who painted their own canvasses on the subject, which were then displayed at an open day. People who came from surrounding communities demonstrated fuel-saving technologies and performed dances and drama to raise awareness of climate change issues.

The District Commissioner for Thyolo, Mr Bester Mandele, who was guest of honour, spoke of the need to constitute a committee at district level to look into climate change issues, with particular emphasis on collecting data so that programming could be based on accurate and up-to-date information.

Detail from 'Green Future' by Innocent Willinga



Conclusions and recommendations The foundation of any initiative to address climate change hinges on community ownership; at the same time there must be wider supportive political and institutional frameworks.

Scores of schoolgirls, from the Mitengo Primary School went on a colourful march during the Thyolo District Assembly open day on climate change. More than 4000 people participated.

Conclusions and recommendations at community level.
At a community level, poor communities are worst affected by, and least able to cope, with climate change impacts. Therefore the foundation of any initiative to address climate change hinges on communities being aware of the issues, owning the process of adaptation and having the capacity to undertake and maintain adaptation. At the same time, there must be wider supportive political and institutional frameworks.

Local knowledge based on first-hand experience of climate change and adaptation is going to be critical to the successful design of community adaptation and this must be tapped.

Women in Malawi bear the greatest burdens from climate change so it is crucial that their participation is made central to adaptation efforts.

Local sustainable environmental and natural resource management are essential in order to reduce vulnerability whether caused by climate change or by environmental degradation. These should be strengthened within adaptation and also Disaster Risk Reduction programmes.

People do not perceive climate change as something separate or additional to their lives and livelihoods, but intimately connected. Therefore, it is important to ensure that initiatives to address climate change are equally integrated with the promotion and diversification

of sustainable livelihoods. Vulnerability assessments need to take account of projected future climate hazards as well as current variabilities. Likewise, adaptation measures that address current *and* future levels of climate change should be given priority.

Conclusions and recommendations for Civil Society Organisations. Among civil society and non-governmental organisations:

Civil Society Organisations (CSOs) working in Malawi should make climate risk analysis an integral part of all appraisals before initiating work with communities.

CSOs and INGOs should facilitate awareness and capacity-building around climate change, in their staff, their partners, government and other organisations, and in the communities which they serve.

CSOs and international NGOs should work together both to strengthen community-based climate change adaptation and disaster risk reduction and to strengthen advocacy at national level. They need to advocate for government to take up its responsibilities for leadership and co-ordination at all levels, and government to demand new, additional, sufficient and predictable flows of adaptation finance from the industrialised countries both most responsible for today's climate impacts and most capable of assisting. They need to advocate too for industrialised countries to drastically and urgently reduce their greenhouse gas emissions.

Conclusions and recommendations at government level. The government should strengthen institutional mechanisms for more effective co-ordination of climate change adaptation and Disaster Risk Reduction programmes. The government should establish budgetary allocations to finance the NAPA projects and further climate change initiatives. To be successful, all these efforts must involve poor communities and civil society.

The government should strengthen linkages between the Environmental Affairs Department and the Department of Disaster Management Affairs. This should include developing a methodology for harmonised vulnerability and adaptation assessment.

Agriculture and related activities should get priority in climate related research. Government needs to strengthen the capacity of the Meteorological Department to improve both long-term climate modelling and regular, short-term weather forecasting and dissemination in order to give farmers the information that they need.

Government should prioritise energy efficient stoves and other technologies for cooking and discourage the continued production of charcoal, and help poor and vulnerable communities to find alternative livelihoods.

Government should strengthen formal and informal education about climate change and work with CSOs to raise public awareness.

Based upon the foundation of dialogue and discussion with its citizens, the government of Malawi should proactively participate in international conferences and discussions to highlight the injustice of climate change and the plight of poor countries and communities. In view of the current crucial round of intergovernmental negotiations towards a post-2012 regime, the government should also strengthen investment in capacity building its national delegation and diplomatic corps and join with other Southern governments to press for new mechanisms to ensure flows of sufficient and predictable finance for adaptation in poor countries and communities. The NAPAs need to be funded urgently and in full.

Endnotes

1 'Hot' days or 'hot' nights are defined by the temperature exceeded on 10% of days or nights in the current climate of that region and season.
2 'Cold' days or 'cold' nights are defined as the temperature below which 10% of days or nights are recorded in the current climate of that region or season.
3 Evidence of trends in daily climate extremes over southern and west Africa, M New et al, Journal of Geophysical Research, vol. 111, 21 July 2006. (Malawi National Meteorological Service contributed to the study).
4 New et al, ibid.
5 http://country-profiles.geog.ox.ac.uk/index.html?country=Malawi&d1=Reports
6 Ibid.
7 David S Battisti and Rosamond L Naylor, Historical Warnings of Future Food Insecurity with Unprecedented Seasonal Heat, Science, 9 January 2009, vol. 323, no. 5911, pp 240-244.
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9 Changes in growing-season rainfall characteristics and downscaled scenarios of change over southern Africa: implications for growing maize, Tadross, Suarez et al. IPCC regional Expert Meeting on Regional Impacts, Adaptation, Vulnerability, and Mitigation, Nadi, Fiji, June 20-22, pp 193-204, (2007). Correspondence to Mark Tadross, Climate Systems Analysis Group, Dept. Environmental & Geographical Science, University of Cape Town, Rondebosch 7701. South Africa (mtadross@egs.uct.ac.za, Tel: +27 21 6502884, Fax: +27 21 6505773).
10 Climate change and smallholder farmers in Malawi: understanding poor people's experiences in climate change adaptation, ActionAid, October 2006.
11 UNAIDS 2008 Report on the Global AIDS Epidemic.
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13 Malawi Essential Health Services Campaign For All Campaign: Country Case Study, November 2008.
14 Ibid.
15 The original estimate of food insecure people for 2008/9 was 1,490,000 – see FewsNet, September 24th, 2008.
16 See LEISA, September 2008, vol. 24, no.3, pages 16-17 for a discussion on fertilizer subsidies.
17 Battisti and Naylor, ibid.
18 Avoiding Repetition: Time for CBA to Engage with the Livelihoods Literature? Rachel Sabates-Wheeler, Tom Mitchell and Frank Ellis, IDS (Institute of Development Studies) Bulletin Vol. 39. No.4, September 2008.

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