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National Adaptation Strategy to Climate Change Impacts: A Case Study of Malawi

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NATIONAL ADAPTATION STRATEGY TO CLIMATE CHANGE IMPACTS A CASE STUDY OF MALAWI

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Introduction

Bordered by Mozambique, Zambia and Tanzania in the Southern part of the continent of Africa lies the country, Malawi covering 11.8 million hectares, of which 9.4 million is land, while the rest is composed of water bodies dominated by Lake Malawi. Of the total land area, 31% is suitable for rain-fed agriculture, 32% is marginal and 37% is unsuitable for agriculture. With the growth rate of about 2%, Malawi's population is estimated at 12 million (MDHS 1998). About 85% of the population is based in rural areas with women forming 51% of the population and life expectancy as low as 40 years.

The impacts of climate change are likely to be considerable in tropical regions. Developing countries are generally considered more vulnerable to the effects of climate change than more developed countries, largely attributed to a low capacity to adapt in the developing world (Thomas and Twyman, 2005). And of the developing countries, many in Africa are seen as being most vulnerable to climate variability and change (Slingo et al., 2005).

Like many other developing countries, Malawi has not been spared from the severe impacts of climate change. In the last two decades, Malawi has experienced a number of adverse climatic hazards. The most serious ones have been dry spells, seasonal droughts, intense rainfall, riverine floods and flash floods. Some of these especially droughts and floods, have since increased in frequency, intensity and magnitude over the same two decades, and have adversely impacted on food and water security, water quality, energy and sustainable livelihoods of the most rural communities.

Assessment of main vulnerabilities

The vulnerability and adaptation (V&A) assessment of climate change is in conformity with Articles 4.1 (e), 4.8 and 4.9 of the United Nations Framework Convention on Climate Change (UNFCCC) to which Malawi is a party. Malawi is vulnerable to climate change and extreme weather events (DEA, 1998, 2002a, 2004). The Vulnerability and Adaptation Assessment Report of 2001 (EAD, 2002b) has clearly indicated that Malawi is experiencing a variety of climatic hazards, which include intense rainfall, floods, seasonal droughts, multi-year droughts, dry spells, cold spells, strong winds, thunderstorms, landslides, hailstorms, mudslides and heat waves, among many others.

Currently, the majority of rural communities are experiencing chronic food deficits in many parts of the country on a year-round basis owing to the effects of floods and droughts. This situation has been compounded by the high prevalence of HIV/AIDS that has created a large number of dependant orphans, and has also adversely impacted on rural household food production systems, as well as the quality of life and sustainable livelihoods.

The increasing prevalence of the recurrent floods and droughts is of major concern to the Government of Malawi because of their far-reaching consequences on food, water, health and energy. Erratic rains have resulted in acute crop failure, despite concrete efforts to improve seasonal weather forecasting at the beginning of the rainy season. Crop failure has resulted in food insecurity and malnutrition, especially among vulnerable rural communities. On the other hand, floods have resulted in the disruption of hydroelectric power generation, water pollution and increased incidence of diseases, such as malaria, cholera and diarrhoea. It is against this

background that the government has put in place several policies and strategies to address the adverse impacts of climate change on food, water, health and energy, as articulated in vision 2020, the Malawi Poverty Reduction Strategy Paper (MPRSP), and the Malawi Economic Growth Strategy (MEDGS), among many other documents.

The analysis of climate change impacts in Malawi, though not systematic due to inadequate resources both human and capital, reveals that Malawi has been impacted in almost all the sectors of development. This paper has tried to summarise the impacts of climate change by sector so as to be clear of the specific type of impacts over the decades. Agriculture, the mainstay of Malawi's economy and survival is presently heavily dependent on weather/climate especially natural rainfall. Malawi therefore relies on rain-fed agriculture, and the current 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 in the country. The most vulnerable groups are rural communities; especially women, children, female-headed households, the elderly and the HIV/AIDS infected and affected families.

The health sector is also directly affected by climate but even though there is evidence in Malawi, research to support this is scanty. The Climate Change and Health Study with emphasis on Malaria and Cholera commissioned by CURE (Coordination Unit for the Rehabilitation of the Environment) with support from DFID (UK Department for International Development) through IIED (International Institute for Environment and Development) will form a baseline for more studies to be done in the near future. Studies conducted have shown direct linkages between climate change and health. In Malawi this 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 colder areas as temperatures increase (WHO. 2003). Yet the health services in Malawi face a number of challenges such as high patient to doctor ratio, inadequate infrastructure, prevalence of serious communicable diseases and lack of adequate resources to purchase necessary medicines. Besides, the HIV/AIDS pandemic is affecting the most productive age group thereby negatively impacting the economic productivity of the nation.

Malawi's energy resources include biomass, coal, hydropower, solar and wind. The energy system is dominated by biomass, which is the major energy source for the domestic and industrial development with only 4% of its population having access to the grid electricity. The energy sector is equally seriously affected by droughts and floods, which negatively impact on hydroelectric power generation along the Shire River, a major source of energy in Malawi. The water flow disruptions have been exacerbated by siltation caused by poor and unsustainable agriculture practices, deforestation, and noxious weeds such as water hyacinths.

Droughts and floods are the major climatic hazards affecting the fisheries sector in Malawi. There are between 700 and 1000 fish species in Malawian water bodies. The fisheries industry contributes 4% of GDP and over 60% of animal protein intake in Malawi. In addition, the diversity of fish species is of global significance since most of them are endemic to Malawi (EAD, 2003). Droughts and floods 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 destruction of fishponds, such as in 2000/2001, drying of lakes, such as Lake Chilwa in 1995 which completely dried up resulting in total loss of fish stocks.

Traditionally, wildlife in Malawi has been treated by rural communities as a common good and has contributed to food security and household income, as part of the livelihood strategy of a rural population of predominantly subsistence farmers and fishermen. The major climatic hazard that affects the wildlife sector is drought. Drought affects animal reproduction systems and migratory habits. For example, the 1979/1980 droughts resulted in the death of Nyala in Lengwe National Park in Chikwawa District and the migration of most animals from game reserves.

Malawi's water resources comprise surface and ground waters. The surface water resources consist of a network of river systems such as Shire, Ruo, Bua, Rukuru, and Songwe and lakes such as Malawi, Chilwa, Chiuta and Malombe. The lakes and river systems cover up to 20% of the total surface area. Lake Malawi, the third largest in Africa, stocks large quantities of surface water resources. Water is therefore a critical resource for human and industrial use, and for the maintenance of ecosystems. Increasing droughts and floods seriously disrupt water availability, quantity and quality. The city of Blantyre is quite often hit by shortages of water resulting in outbreaks of diseases when drought is experienced. During floods, shortage of water is due to bursting of water pipes and silting of dams.

In terms of the forestry sector, the most important climatic threat is the extended droughts, which lead to land degradation and loss of soil fertility, as well as forest fires. For example, during the drought of 1995, some 5,550 ha (or 36%) of Chongoni forest were destroyed by forest fires resulting in smoke haze, pollution, loss of seedlings and biodiversity.

Women form 51% of the population of Malawi and are actively involved in the productive sector of the economy. However, their contributions have not been fully recognized. Gender mainstreaming is being promoted to empower women and other vulnerable groups in economic, social and cultural sectors. Climate change and climate variability have undesirable effects on human communities. Poor rural communities are the most vulnerable. However, men and women in a given society or community, or socio-economic group, are impacted upon differently. For example women in Malawi are primarily responsible for collecting water for household use, so that during drought periods, they travel long distances to collect water for domestic use. In addition, the changing demographics, as a result of the impacts of the HIV/AIDS epidemic, have meant that women take up greater responsibilities, such as taking care of the sick and orphans.

Policy Framework for Adaptation

National Vision

In 1998, Malawi launched the Vision 2020, a national long-term document that articulates the country's aspirations for sustainable economic growth and development, and for the sustainable utilization of natural resources and the environment (EAD, 1998). It also provides for national development goals, policies and strategies. While emphasising sustainable development, it also recognizes the importance of monitoring GHG emissions, adoption of ozone-friendly technology and promotion of public awareness on climate change issues. This was followed by the Malawi Poverty Reduction Strategy Paper (MPRSP) in 2002 (MG, 2002B), aimed at reducing poverty through socio-economic and political empowerment of the poor. The MPRSP was developed through consultations with a wide cross-section of stakeholders at national and local levels. It is built around four pillars, which are the strategic components grouping various activities, policies and strategies, into a coherent framework for poverty reduction. These pillars are: (i) rapid sustainable pro-poor economic growth and structural

transformation, (ii) human capital development, (iii) improving the quality of life of the most vulnerable, and (iv) good governance. This document also mainstreams crosscutting issues, such as HIV/AIDS, gender, science and technology and the environment, including climate change, which are all very relevant to development.

National Plans

After the Earth Summit in Rio de Janeiro, Brazil in 1992, Malawi launched its National Environmental Action Plan (NEAP) in 1994 (EAD, 1994; 1995). NEAP, which is Malawi's operational tool for the implementation of the Agenda 21, was developed through a consultative process involving a wide cross-section of stakeholders at national and local levels. This NEAP identifies and highlights several environmental issues including: high soil erosion, low fertility, deforestation, overgrazing, over fishing, loss of biodiversity, water resources degradation and depletion, human habitat degradation, air pollution and climate change.

Currently, Malawi has developed policies and strategies to stimulate economic growth and development. This will be done through reducing poverty to ensure food and water security, empowering vulnerable rural communities, ensuring sustainable utilization of Malawi's abundant natural resources, and by protecting the environment, as articulated in Vision 2020, the Malawi Poverty Reduction Strategy Paper (MPRSP), the Malawi Economic Growth Strategy (MEGS) and the National Environmental Action Plan (NEAP).

With its narrow economic base, limited agro-processing industries, over-dependency on rain-fed agriculture and biomass for energy, Malawi is highly vulnerable to the adverse impacts of climate change and extreme weather events. This situation is exacerbated by increasing poverty among rural communities, increasing population pressure on a limited land resource base, land degradation arising from agricultural expansion and the cultivation of marginal land, and increasing deforestation to meet the increasing demands for energy, food and construction purposes.

The loss of human, natural, financial, social and physical capital, caused by the adverse impacts of climate change, especially floods, drought and land slides, among many other natural disasters and calamities, is of great concern to the Malawi Government, as it strives to ensure sustainable livelihoods for all its citizens. The threat posed by extreme weather events to food, health, water and energy has been the driving force for the preparation of Malawi's National Adaptation Programmes of Action (NAPA). As a coping strategy, Malawi undertook to prepare a NAPA document so as to respond to the urgent and immediate needs for adaptation to climate change. The process of developing the National Adaptation Programmes of Action (NAPA) for Malawi involved a wide cross-section of consultations with many stakeholders in the public and private sectors, including Non-Governmental Organizations (NGOs) and vulnerable rural communities. A multi-disciplinary team of consultants in the agriculture, human health, energy, fisheries, and wildlife, water, forestry and gender sectors prepared sectoral reports, which have formed a basis for this plan. Two teams were set up, the NAPA Documentation Team and the NAPA Editorial Team. The NAPA Documentation Team, to which the author of this case study belonged, synthesized all the eight sectoral reports and prioritised the adaptation options using the multi criteria analysis while the Editorial Team developed the project profiles, logical framework as well as the final document.

NAPA Main Findings

The major findings of the NAPA for Malawi are that the most typical climatic hazards are floods and drought. As such, all the eight sectors that prepared the sectoral reports are equally greatly

impacted by climate change in Malawi. The agricultural sector in Malawi is heavily dependent on rain-fed agriculture. Too much or too little rain affects crop production, therefore resulting in shortage of food. The forestry and wildlife sector is equally at risk when there is drought. Animals do migrate or die while forests are affected by serious bush fires as a result of drought. The health sector also experiences problems with drought and floods. The spread of vectors that cause diseases is directly controlled by floods and drought. The rise in temperature has been associated with an increase in malaria, while droughts which lead to shortage of good water and floods that contaminate water points also promote the prevalence of diseases such as diarrhoea. The energy sector which derives its hydro-electric power from the Shire River is also affected directly with floods and droughts. Siltation caused by poor farming systems in Upper Shire coupled with water hyacinth has greatly affected electricity generation in Malawi. On gender, women are greatly impacted with drought as they are involved in water collection and hence shortage of water means that they have to travel long distances to collect water. In all aspects of the impacts that the NAPA found, the most impacted groups are the most vulnerable, female headed households, children, the old and the HIV/AIDS infected and affected people.

Guided by these sort of findings, the NAPA of Malawi has come up with priority areas of action to reduce the suffering of the most vulnerable communities as follows:

- ✓ Improving community resilience to climate change through the development of sustainable livelihoods.
- ✓ Restoring forests in the Upper Middle and Lower Shire Valley Catchments to reduce Siltation and associated water flow problems.
- ✓ Improving agricultural production under erratic rains and changing climatic conditions.
- ✓ Improving Malawi's preparedness to cope with drought and floods and finally
- ✓ Improving climatic monitoring to enhance Malawi's early warning capabilities and decision making and sustainable utilization of Lake Malawi and Lake Shore areas resources. *(NAPA – EAD, Malawi) March 2006.*

The five priority projects above were arrived at after subjecting about 15 projects that were presented to a number of tests that led to picking those that ranked highly in terms of importance and urgency. To implement the above projects, Malawi will require US\$ 22.43 million and that will enable vulnerable rural communities and groups in targeted areas to adapt to adverse impacts of climate change.

The rationale for developing the NAPA in Malawi was done not only by synthesizing the vulnerabilities of the eight sectors but also in relation to several international, national and local development policies and strategies. Further to this, sectoral environmental action plans and disaster preparedness and emergency response plans were also consulted.

For the prioritised projects, the NAPA strived to identify who would be involved in the implementation of which projects and in which areas while scaling up on similar projects by other development partners. The Malawi Poverty Reduction Strategy Paper (MPRSP) unlike the National Adaptation Programme of Action for Malawi failed to include climate change in its programmes. The MPRSP recognises Environment and Natural Resources as a cross-cutting issue just like gender and science and technology. It is therefore clearly silent on climate change.

Key adaptation Needs

The most vulnerable areas to floods are river valleys, the lakeshore plain and the Upper Middle and Lower Shire Valleys, whereas droughts affect all parts of Malawi in all years. Severe

droughts occurred in 1915, 1948, 1992 and 1995, whereas recent floods occurred in 2000 and 2001, 2002, 2003, 2004 until to date. People living near riverbanks are the most vulnerable to floods, which result in untimely deaths, disease outbreaks and the destruction of crops and property. During drought years, many people, especially children and the elderly, suffer from malnutrition and are easily attacked by various types of diseases. Livestock and wild animals are equally adversely affected by drought.

In most parts of Malawi, rural communities have tried to devise ingenious ways to cope with and adapt to the adverse impacts of extreme weather events, including shifting homes to higher ground, storing grain in local granaries, hunting small animals, gathering and eating wild fruits and vegetables, sinking boreholes, and using traditional medicines to cure various ailments and diseases. However, some of these are not as effective as one would wish. A list of actual and proposed adaptive measures in the agriculture, water, forestry, fisheries and wildlife sectors are given in Malawi's Initial National Communication to the Conference of Parties (CoP) of the United Nations Framework Convention on Climate Change (UNFCCC) DEA, 2002 a)

Potential barriers to implementation.

Malawi recognises the importance and urgency of addressing the problems associated with Climate Change because these affect the sustainable livelihoods of all Malawians. Hence the need to urgently implement the proposed adaptation options listed in the NAP document. However, there are several barriers that may hamper the implementation of these activities. There is a need to address these for the smooth implementation of the proposed activities.

Apart from limited internal capacity to fund adaptation activities, Malawi is also constrained by several other factors, including: (i) extreme poverty of the most vulnerable groups, who are also illiterate, making it difficult to transfer new technologies and conduct meaningful long term planning, (ii) poor infrastructure, especially poor roads and bridges, making it difficult to access rural areas, hence difficulties in delivering farm inputs (e.g. fertilizer and seeds) and accessing markets, (iii) limited credit opportunities for rural communities, to allow family households easily access to farm inputs, (iv) food insecurity in the Southern Africa Development Community (SADC) that would make it difficult for Malawi to acquire food from neighbouring countries, further aggravating the costs of coping with current droughts and floods, (v) existence of a large number of HIV/AIDS orphans, creating a major drain on family energy, cash and food, a situation that is more critical in rural areas among the poor, with limited capacity to produce enough food and who are easily attacked by disease, (vi) poor health conditions of resource-poor rural communities, leading to high rates of malnutrition, especially in children and the elderly, limiting the ability of the people to effectively respond to opportunities for work, and (vii) limited analytical capability of local personnel to effectively analyse the threats and potential impacts of climate change, so as to develop viable adaptation solutions.

Conclusion and Way Forward

Malawi has in the last decade experienced and continues to experience many adverse impacts of climate change, climate variability, and extreme weather events. The major climatic events include: dry spells, droughts, floods and heat waves. These have had devastating effects on food, water, health and energy, negatively impacting on sustainable livelihoods of vulnerable rural communities. Some of these events have increased in frequency, magnitude and geographical coverage, thereby negatively affecting the socio-economic well being of all Malawians. With about 65% of the population living below the poverty line, Malawi's vulnerable communities do not have sufficient capacity to cope with, or adapt to, the adverse impacts of

extreme weather events. Government is therefore called upon to put in place programmes that would help vulnerable communities especially the aged, female headed households, children and the HIV/AIDS affected and infected people to live their lives sustainably. Developed countries are also urged to allocate enough money towards adaptation programmes to climate change that will promote the sustainable livelihoods of the disadvantaged.

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