ENVIRONMENTAL AFFAIRS DEPARTMENT

Towards Adaptation

Malawi in a Changing Climate

20-Feb-17

1.0. Introduction

Malawi is one of the countries that have been greatly affected by climate change in recent history. Changes in weather patterns have seen increases in dry spells, floods, and other natural disasters that have worked to the disadvantage of the country's economy, which highly depends on rain-fed agriculture. For example, it has been established that Malawi loses on average 4.6% of the maize production (nationally) each year due to droughts, and 12% to flooding in the southern region, where about one-third of Malawi's maize is grown. These losses equate to 1.7% of the gross domestic product, equivalent to almost US$22 million in 2005 prices (World Bank et al 2009). The effects of climate change have been exacerbated by the country's narrow economic base, high levels of poverty, rapid population growth, and unsustainable use of the available natural resources. The Ministry of Natural Resources, Energy, and Environment also projected that the overall trend is for slightly warmer winters and hotter summers (2011).

The Government of Malawi through the Environment Affairs Department, with support from GEF and UNDP, is Implementing urgent adaptation priorities through strengthened decentralised and national development plans (ADAPT PLAN). From this backdrop, the case studies here give a glimpse into some of the efforts that selected communities have taken in adapting to the impacts of climate change through the ADAPT PLAN project. UNDP is committed to supporting the development and implementation of the National Climate Change Management Policy in Malawi, as detailed in the UNDAF Action Plan for 2012 – 2016 and ensuring that countries are able to reduce and manage risks of conflict and natural disasters – including those from climate change – in ensuring sustainable human development. The baseline stories have been collected from the strategically selected districts of Ntcheu, Zomba, and Nkhata Bay, where efforts to adapt to the adverse impacts of climate change at community level are underway.

2.0. Communities Under a Scorching Sun: the Case of Ntcheu District

For the ADAPT PLAN project, Ntcheu district selected the Chipusire catchment area. This area is affected by the increasing frequency of dry spells, and is the source of many rivers: Mpamadzi, Mariko, Chipusire, Mdeka, Mpira, Riviridzi and Nkhande. The Mpamadzi and Mariko rivers are a water source for the Central Region Water Board, which supplies water to over 16,000 people in Ntcheu Boma. The Mpira River sustains the Mpira dam, which traps water to supply portable water to Balaka, Machinga and part of Ntcheu districts.

The catchment is increasingly degraded as a result of deforestation (particularly in Mvai forest) and irrigation farming which, in combination with rainfall variation, has caused water levels to drop. The catchment also experiences soil erosion, bush fires, and pest outbreaks which further reduce agricultural production levels. The root causes of this are over dependency on natural resources for livelihoods, combined with high rates of population growth, poverty, and insufficient knowledge of sustainable practices. Encroachment on protected areas also occurs. Law enforcement is currently insufficient, with poor observance of the closed season for fisheries, and there is inadequate capacity around climate change issues. The results of the challenges are a reduction of water into intake pipes, affecting winter farming and the support to livelihoods for more than 2000 households in Chipusire and water supply to more than 30,000 in Ntcheu Boma, Balaka, and Machinga.

2.1. Stories on the Ground

2.1.1. 24 year old school leaver, Yunike Philimon laments the negative effects of climate change in her area and puts much of the blame on

deforestation. She comes from Chipusire village under Traditional Authority Mpando. She says the place used to be a swamp and they could cultivate a lot of Irish potatoes but the harvest has been dwindling over the years. In tackling this problem, ADAPT PLAN is targeting irrigation farming, which Yunike and her family are currently practicing. Currently, the family is using watering cans to water their small-scale garden. The water is drawn from shallow wells and Yunike is quick to mention that these wells dry up during the dry season such that there is no irrigation farming for a good number of months. However, with the ADAPT PLAN project, Yunike sees some hope for the future since through the project, the community is constructing a water tank and drilling water pumps, on top of championing sustainable use of natural resources and the introduction of fish farming in the area. Yunike sees fish farming as a solution in dealing with poverty and unemployment, mostly among the youth in the area. She thinks that this will minimise pressure on resources.

2.1.2. A focus group discussion was conducted to have a glimpse into the communities' understanding of climate change and their attitude towards the ADAPT PLAN project. The general overview is that weather patterns have changed leading to short term rain, which becomes a challenge to water resources management. Dyson Boyce from Kamuuzeni village points out that loss of trees has led to excessive heat and low rainfall. He also notices that intensive use of inorganic fertilizer is a clear sign of a changing climate. Despite heavy use of fertilizer, produce is still low.

2.1.3. Group Village Headman Chipusire blames the problem of rapid deforestation on Mozambican refugees who introduced the use fresh firewood as a source of energy in the area. He mentions that fruits, rare vegetables, and rare bird species have become extinct due to climate change. He gives an example of a bird called *Nanthonya*, which has become extinct in the area. The rain season used to range between January and June but that is no longer the case. Soil fertility has been greatly compromised due to lack of trees, and huge gullies have been created on land that was formerly productive.

2.2. Anticipated climate change adaptation interventions through the Project

Group Village Headman Chipusire explains that before the introduction of the ADAPT PLAN project, his community embarked on reforestation but this has been a slow and gradual process. One of the villagers, Alfred Winter, says that he resorted to the use of organic manure in an effort to yield bumper harvests. Jackson Muuzamfiti has been planting bushes around his field to counter soil erosion. Due to the extinction of wild game, some villagers in the area have taken to poultry farming both as a source of income and as a source of protein in their diet.

The communities' understanding of ADAPT PLAN proves to be very superficial with most of the people expressing that they only know that it is an initiative to do with climate change. Nevertheless, the project has spelled hope on the people of Chipusire in that new projects have been established to adjust to the effects of climate change. Group Village Headman Chipusire argues that the project is tackling the most crucial aspects of human life such as food, water, and health in general. The villagers have welcomed the project and are working hand in hand with the implementers to demonstrate ownership. Most people view the intensification of fish farming as one of the promising advantages of ADAPT PLAN.

In order to counter the problem of deforestation, the ADAPT PLAN project has introduced new cooking burners in the area that reduce the use of firewood. These are called 'Kinda' burners and the people think they are cost effective compared to charcoal burners that demand heavy use of trees. At the moment, the burners are not yet in use but the villagers are hopeful for positive change.

Commenting on the project, District Water Development Officer for Ntcheu, Michael Harawa, says that his department will be responsible for the provision of water in all aspects of the project. The department will also take part in catchment management activities with regard to climate change. He points out that the principle challenge facing the ADAPT PLAN project is the scarcity of water. Most facilities that provide water, e.g. boreholes, are defunct due to inadequate funding for maintenance. However his department is trying to diversify uses of water so that it helps alleviate people's suffering. Harawa believes that the ADAPT PLAN project is viable since it concentrates on basic needs.

Edward Khuoge, who is the Acting District Fisheries Officer for Ntcheu, sees fish farming as a way of diverting people's attention from other natural resources such as cutting down of trees and poor farming methods. He regards fish farming as a feasible project since his department has collaborated with the Water Resources Management department to generate water via solar power to supply the fish farmers. They have also intensified trainings to civic educate farmers on sustainable fish farming. All these efforts are in line with the ADAPT PLAN project in its endeavour to help households adapt to the adverse impacts of climate change.

3.0. Flooding, Dry spells, and Strong winds: the Case of Zomba District

Zomba district comprises variable topography, from mountainous and hilly regions of the Zomba Plateau (up to 2,085m) which forms the ridge dividing the Upper Shire Valley in the western part of the district, to the broad, flat plains of Lake Chilwa in the east (627m elevation).

The underlying geology is Precambrian metamorphic in the uplands, and stratified sandy and rocky plains by the lake. The uplands are a combination of semi-evergreen forest and savannah, turning into moderate wetlands nearer to the lake. The major rivers in Zomba district are Likangala, Thondwe, Domasi, Mulunguzi, Naisi, Namadzi, Phalombe Lintipe and Likwenu. Zomba plateau is the source of all but two of these rivers, namely the Shire, which originates in Lake Malawi and the Phalombe, whose source is on Mulanje Mountain.

The rivers form part of the Lake Chilwa Catchment Area. Lake Chilwa, an inland drainage lake located 25 kilometres east of Zomba City, is the only lake in the district and the most prominent source of water and fish for many people. Much of the district experiences floods, particularly in the lowland regions, which is exacerbated by upland deforestation and land degradation. One target area, T/A Mwambo, was selected as it experiences the dual hazards of dry spells and floods. The second target area, T/A Ngwerero, was selected as it experiences dry spells and weather-induced outbreaks of pests. Livelihoods in both T/As are dependent on natural resources, whose availability varies with climate variability and are under pressure due to high population growth rates, poverty and illiteracy. Apart from diversification of livelihood opportunities, safe water provision is also a challenge as is the management of solid and liquid waste.

3.1. Stories of the Ground

3.1.1. In T/A Ngwerero's area, the impacts of climate change are evident in deteriorating standards of living among the subjects, whose livelihoods are highly dependent on agriculture. Mr. And Mrs. Hapala of Issah II Village express their ordeal by tracing changes in the environment in recent years. Mr. Hapala, 69, argues that in the past, food never used to be a problem since they had adequate rain but this is not the case anymore. Since subsistence farming can no longer sustain his family of

eight, he has resorted to hiring out his labour wherever possible. For food, he mostly counts on his small vegetable garden, which was made possible by a seed donation from the World Food Program (WFP).

His wife concurs with him by pointing out that it's hard for the family to find food due to dry spells and scarcity of money. The family used to cultivate rice but the production has been dwindling over the years due to shortage of rain. This year, for example, the family failed to even harvest a full bag of rice and they resort to millet as a coping mechanism since regular food is scarce.

3.1.2. Village Headman Issah sees the initiation of the ADAPT PLAN project as a solution to the problems of climate change in the area. He believes the projects under ADAPT PLAN will be crucial in adjusting to the effects of irregular rainfall, flooding, and dry spells. People in the village have embarked on a fish farming project in order to counter the adverse effects of climate change. Currently, a pond is being constructed for this project. One of the women in the village, Ida Kasonya, says that the villagers have taken a leading role in implementing this project – from establishing the site to baking bricks for the project – and they hope for better lives in the foreseeable future.

3.1.3. In T/A Mwambo's area, Bertha Kapindula, a mother of three, laments that since they started experiencing the negative impacts of climate change, hunger has become a big problem for most people. She says that in the last 3 years, people in the area have had a bad farming experience. She used to engage in rice farming but she no longer has the capacity after losing out a lot to erratic weather patterns. Due to this, sweet

potatoes have become an alternative form of staple food. She says strong winds on Lake Chilwa have gravely affected fishing, which is one of the sources of income for most people in the area.

3.1.4. Group Village Headman Mbalame admits that his area has been heavily impacted by climate change and regards ADAPT PLAN as a good opportunity for a new beginning. He points out that at first irrigation farming only targeted areas along river banks but the ADAPT PLAN project has extended this farming deep into the villages. Since ADAPT PLAN, fisheries and forestry departments have also embarked on missions to help communities adapt to climate change, for example, by moving towards fish farming and reforestation. However, the chief is quick to mention that the ADAPT PLAN project can only be beneficial if it is supported by other sectors to ensure that there is both civic and formal education for the communities to better understand the meaning of climate change and how it can be countered.

3.2.Anticipated climate change adaptation interventions through the Project

Florence Ntepa, who is the Assistant District Disaster Management and Preparedness Officer for Zomba, admits that in recent years the district has become a hub for multiple natural disasters due to drastic changes in weather patterns. Among the problems the district is facing, she mentions flooding, dry spells, strong winds, cholera, and the siltation of Lake Chilwa. She says that under ADAPT PLAN, the Department of Disaster Management and Preparedness is mostly interested in capacity building by working with different sectors such as irrigation, land, and water resources management departments to remedy the risks of disasters. The department also makes sure that people understand climate change, its causes, and its linkage to natural

disasters. She posits that the ADAPT PLAN project has had an overwhelming response and that people are willing to adapt to new ways of doing things.

District Fisheries Officer for Zomba, Lapken Chikoko, admits that Lake Chilwa has been drying up and this is affecting the livelihoods of those who depend on fishing. Even fish ponds are drying up as a result of dry spells such that farmers are making losses and food is becoming scarce. With ADAPT PLAN, the fisheries department will focus on capture fisheries development as well as aquaculture so that communities can learn how to make fishing sustainable while at the same time finding alternative sources of income. In this regard, the department is also introducing new fishing techniques in the area of T/A Ngwerero to enable people diversify in what they depend on for a living.

Chikondi Kamphanda, who is the District Irrigation Officer, acknowledges that irrigation has been highly affected by climate change. As a result of little to no rain, water has become a scarce resource and this has gravely affected various forms of farming. In the communities, coping to the situation has become very difficult as farmers only try as much as to make use of the little water there is. Previously, the department was encouraging diversion of water from rivers but in the wake of ADAPT PLAN, efforts have been redirected towards extracting water underground by use of solar pumps. He believes that if all the efforts are successful, there will be great change in Mwambo and Ngwerero. For example, in Mwambo, river diversion was almost impossible but with initiatives in the ADAPT PLAN, irrigation farming stands a chance in the area.

4.0. Communities under the wrath of irked nature: the case of Nkhata Bay District

Nkhata Bay selected the Lweya-Limphasa valley area, covering six Traditional Authorities (T/As), namely Fukamalaza, Mankhambira, Mkumbira, Timbiri, Kabunduli and Mnyaluwanga which fall in seven Extension Planning Areas. The Lweya-Limphasa valley area has a

population of 140,143 people with over 23,000 farming families, representing 55% of the total farming families present in Nkhata Bay district (National Statistics Office, 2008), growing cassava as the predominant food crop, and some maize and rice for commercial purposes. The Lweya-Limphasa landscape is the area in Nkhata Bay most prone to floods. Underlying reasons for increasing vulnerability include high levels of deforestation and river bank cultivation, themselves stemming from population pressure and unsustainable farming practices that result in low soil fertility, high rates of erosion and high sedimentation and siltation. Sedimentation and siltation, in turn, affect the lake and can impinge on the availability of fish stocks. Wildlife populations are also decreasing over time due to over hunting and habitat deterioration. There is inadequate water and poor sanitation amenities resulting in high incidences of waterborne diseases such as cholera and dysentery. Limited access to clean water also means that some people fetch and use untreated water from the lake or those residents in the uplands travel long distances to find a borehole for clean water. There is lack of awareness of community members on climate change and natural resource management, and the sub-district level governance structure for management of natural resources, especially in the forestry and fisheries sectors, are currently non-functioning.

4.1. Stories on the Ground

4.1.1. In Chintheche, communities have embraced livestock production as an alternative source of income in trying to cope with the effects of climate change in the area. With the ADAPT PLAN, groups of farmers already rearing livestock have been roped in to assist those who have been newly introduced to the adaptation projects. Maria nya Usisya is one of the farmers practicing pig farming in the Umodzi Group. She says that she engages in pig farming since rain has become scarce and some of her crops were washed away by floods in 2015. She acknowledges that the

climate has changed and thinks that it is only necessary for people to adopt new ways of handling the environment.

4.1.2. Another pig farmer, Reuben Mkhwakwata says that pig farming is more beneficial and sustainable unlike crop husbandry, which, with the change in climate, mostly relies on subsidized fertilizer from the government. He explains that their group raises pigs to tackle food shortages as pigs are highly fertile in terms of reproduction. The group also acts as a centre of reference for piggery around the area. His argument is that due to climate change, weather has become very unpredictable and animal husbandry is a viable remedy in efforts to adapt to climate change.

4.1.3. Chairman of Umodzi Group, Dalison Banda, laments that with climate change, food has become a problem in the area. Among other things, previously farming families are now depending on small-scale businesses for income. As such, pig farming becomes an alternative means of earning a living. He says that communities are doing their best to tackle the problems of climate change and the Department of Agriculture is also playing a major role in assisting them with expertise on new ways of farming.

4.1.4. In Mpamba Extension Planning Area (EPA), communities are engaged in a wide range of activities to cope with the impacts of climate change. They have embarked on aquaculture, crop husbandry, and bee keeping, among others. Kisa Banda, a banana farmer in Mpamba, says that people in the area have been greatly affected by climate change. He points to inadequate rain which has aggravated poverty since most people in the

area depend on farming. Again, climate change has seen the emergence on new pests and diseases that attack crops in the area. He mentions the Banana Bunchy Top Viral Disease (BBTVD) as one of the new diseases that have negatively affected banana production in the area.

4.1.5. Dorica Kaunda is another farmer who laments that climate change has worked to the disadvantage of farming in the area, especially because of flooding that has led to loss of fertile soil to erosion. This has affected banana production in the area. She says that since they depend on banana farming, the communities are in big trouble. She also recalls that in the 1970's, Nkhata Bay used to supply bananas to the whole country but that is no longer the case due to the adverse impacts of climate change.

4.1.6. Daniel Phiri of Group Village Headman Nthilinga has another sad story to tell. He used to have 12 hectares of land on which he grew bananas but he lost almost the whole farm to the Banana Bunchy Top Viral Disease (BBTVD). He is now counting on a new nursery, made possible through ADAPT PLAN, to have a fresh start at his farming. He says the new disease affected his faming so much so that he can only manage to get 2 bunches of bananas where he used to get 300.

4.1.7. At Limphasa Integrated Farming, farmers engage in diverse farming for sustainability in the wake of climate change. Lydia Longwe, one of the farmers at the site, explains that their farming ranges from maize, vegetable production, goat rearing, to fish farming. She says that this kind of farming is beneficial as it is interdependent. She points to flooding as one of the major indicators of climate change in the area and

says that the community is trying to find ways of dealing with the problem.

4.1.8. John Chiumia is one of the farmers at Movya Bee Keeping group. He argues that people in the area opted for bee keeping as a way of minimizing the rate of deforestation. This is because people practicing bee keeping are unlikely to cut down trees unnecessarily considering that this kind of farming depends on trees. He says that with climate change, rainfall patterns have become unpredictable and food has become scarce affecting their living standards. Chiumia admits that the ADAPT PLAN project will help the farmers a lot with expertise and he is hopeful for a brighter future.

4.2. Anticipated climate change adaptation interventions through the Project

The District Commissioner for Nkhata Bay, Alex Mdoko, acknowledges that climate change has affected the district in many ways – from floods, droughts, high temperatures, to erratic rainfall patterns. In the face of this, resilience is a challenge with most communities and the council is emphasizing on irrigation farming to improve production. The challenge with this was lack of resources but with the coming in of ADAPT PLAN, there is hope for enough resources to run the projects effectively. Mdoko says that as a DC, his role is to ensure that the right resources are allocated to the right projects. His expectation is that with ADAPT PLAN, people's economic status will improve. He also expects the project to help in building resilience to climate change due to its focus on diversification.

James Botha from the Department of Irrigation explains that under ADAPT PLAN, the department has identified six sites for irrigation farming. Before the project, these sites were idle and the department is trying to help farmers produce more for food and for sale. He admits

that water levels have dropped in the district to the extent that their biggest scheme, Limphasa, produced less than usual in 2015 due to low water levels. As such, they intend to introduce and sensitize the people on new efficient methods of irrigation.

Assistant District Forestry Officer, Catherine Msuku, expresses her pride over the fact that Nkhata Bay has got a lot of trees compared to most districts but she is quick to point out that due to human activities like charcoal burning and development projects such as construction, trees are being cut down at an alarming rate. Increasing population is also putting pressure on forestry resources. The lake has also in a way contributed to deforestation since fishermen are always looking for trees for dugout canoes. The major advantage, however, is that since Nkhata Bay lies in the tropics, trees are quick to mature, which makes reforestation an easier task. Under ADAPT PLAN, the Forestry Department is advocating for bee keeping as a way of dealing with the adverse impacts of climate change.

Bibliography

Ministry of Natural Resources, Energy and Environment, 2011,*The Second National Communication of the Republic of Malawi to the Conference of the Parties of the United Nations Framework Convention on Climate Change*, available online at http://unfccc.int/resource/docs/natc/mwinc2.pdf

Republic of Malawi, 2008, 2008 Population and housing census, National Statistical Office, Zomba.

World Bank, Global Facility for Disaster Risk Reduction and others: 2009; Economic Vulnerability and Disaster Risk Assessment in Malawi and Mozambique: Measuring Economic Risks of Droughts and Floods