



Community Experiences with Climate Change:

Case Study of Salima District



Salima is one of the lakeshore districts in central Malawi. Like other lakeshore districts it is heavily hit by the impacts of climate change. It experiences extreme climatic change events, droughts and floods. In order to demonstrate the scale of the problem of climate change and how local communities are coping and adapting to it, this case study will provide meteorological data analysis and local community experiences in the district. Communities visited included Mphunga and Kandulu Villages of Traditional Authority Ndindi and villages in Traditional Authority Maganga.

Meteorological Data Analysis for Salima

Intergovernmental Panel on Climate Change (IPCC, 1995) has shown that some of the most common climate change impacts include an increase in global and local temperatures and changes in frequency distribution of temperature and rainfall. An analysis of the meteorological data in Salima provides possible evidence that there is variation in rainfall and temperature. Data for planting dates and annual mean temperature anomalies was analyzed.

Shift of Planting Dates

In order to assess changes in seasonal rainfall pattern, different data sets were used to find out if there is any signal suggesting that planting dates have shifted in Malawi. The analysis used the definition of the start of rain as the first occasion with more than 20mm in 2-day period after 1 November and 1 December with dry spells not exceeding 8 days in the next 30 days.

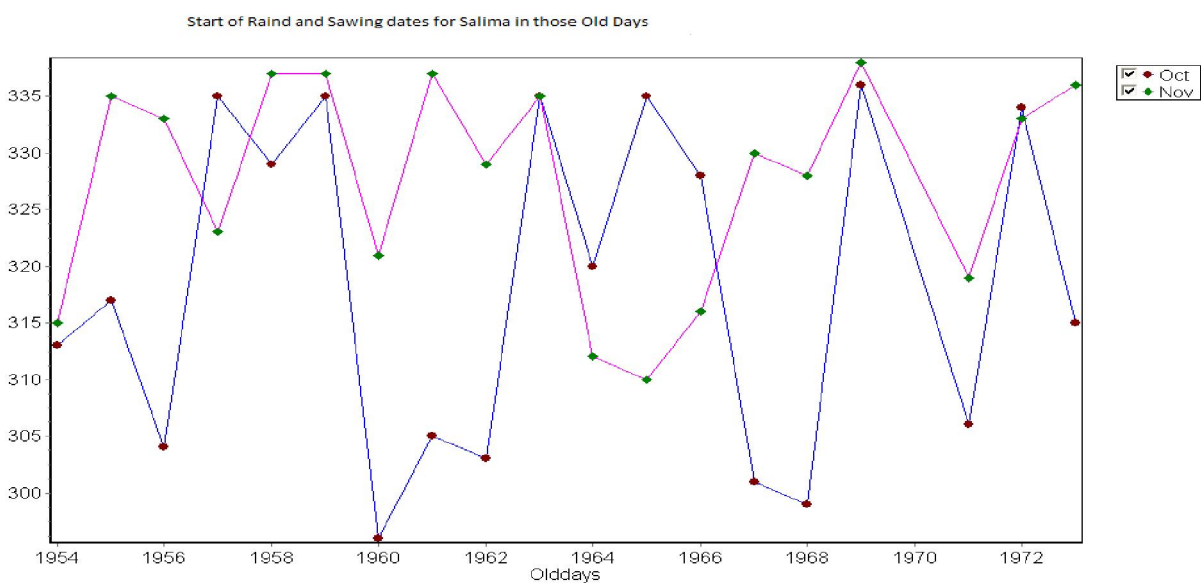


Figure 1a: Possible planting dates between 1954 – 1972

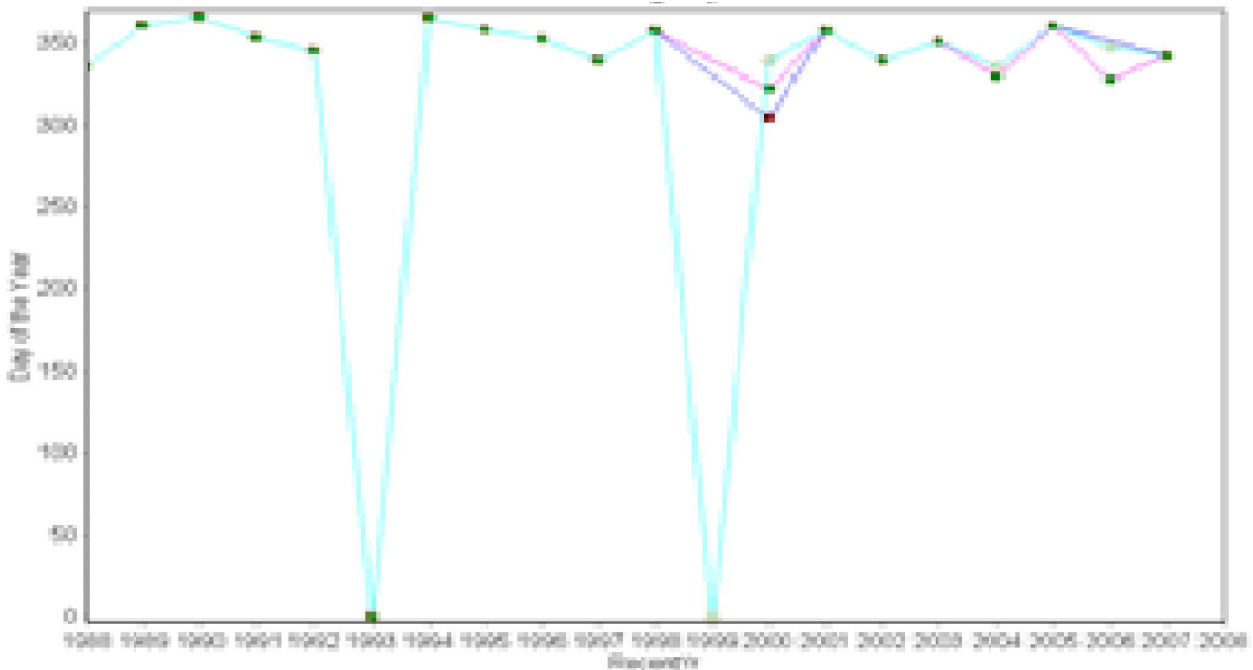


Figure 1b: Possible planting dates between 1988 - 2008

The first graph shows that during 1954 - 1972 period there was a 38% successful planting in October and almost 100% successful planting if done in November. In recent years (1988 – 2008) the second graph is showing that there is no chance of successful planting in October and only 26% of successful planting in November but 100% successful planting in December. In two occasions planting was delayed until January. So it can be interpreted that the planting dates have shifted from October to December in Salima. Box 1 below provides insights from one of the local leaders which to a large extent were in agreement with the interpretation from Figure 1a and 1b above.

Box 1: Climate Change Experiences in Salima District

According to Mr. Nathan Phiri, Secretary for Maganga Area Civil Protection Committee in Salima district who has lived through several droughts and floods, seasonal patterns have changed during recent years, with the duration of rains becoming shorter with each subsequent year. Previously, rains used to come in October. The pattern started changing in the 1980s. Now rains start in late November and we often get planting rains in December. There have been extreme situations when people have had to plant their crops in January due to delay in the onset of the rains. However, instead of ending in late March or early April, as they used to be, cessation of rains is between late February and early March. As such we have had to switch to more expensive hybrid maize varieties that take a shorter period to mature.

Temperature Increase

Figure 2, below shows the annual mean temperature anomalies for selected stations in Malawi, including Salima. The graph is showing that there is a positive mean temperature anomaly since the 1980s pointing towards a rise in temperature.

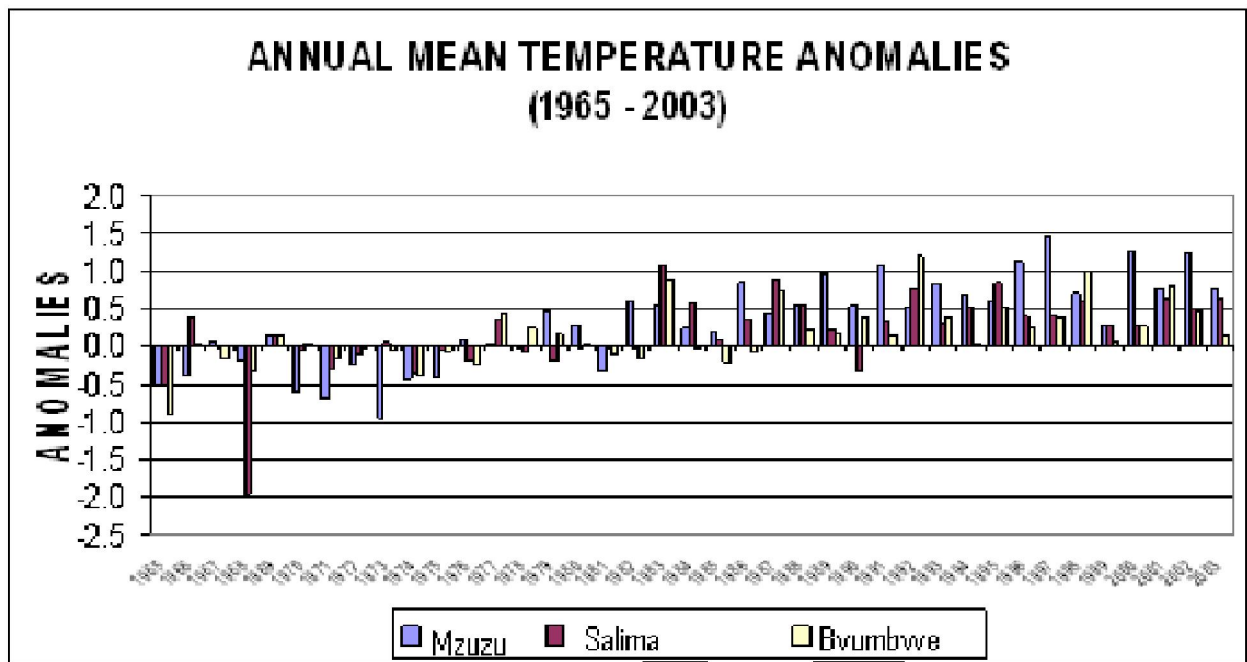


Figure 2: Annual Mean Temperature Anomalies

Community Experiences

Through extensive discussions, community members explained how changes in weather patterns were affecting their livelihoods. Initially it was established that since time in memorial the district has been facing floods and droughts. However, these have increased in frequency, intensity and magnitude during the last three decades. The community's insights are summarized in four key areas.

What Communities Face

The consultations with the communities revealed that they are facing many challenges as a result of the effects of climate change. Communities in Salima are aware of the big issues affecting their livelihood security. Key challenges which communities are facing include:

- An increased frequency of floods – floods wash away crops, erode good soils in the upland gardens and damage infrastructure as houses made of unbaked mud bricks collapse. Floods are now considered an

annual event. The communities explained that much as they have been experiencing floods for decades, previously the impact was somehow not as severe;

- Irregular rainfall pattern – previously rains used to start in October, regarded as rain that made mangoes to ripen. Since the 1980s this pattern has been changing, the rainfall season becoming shorter, experiencing frequent dry spells, late rains and early cessation of rains;
- Drought – causing crops to wither or wilt affecting productivity; and reducing moisture levels in low lying areas which are a major source of crop production during the winter periods; and
- There has been a noticeable increase in diseases such as malaria, cholera and dysentery which has created health challenges. This affects women as they experience the workload that comes with caring for the sick and maintaining household hygiene.

Impacts of Climate Change Related Events

- Local people's ability to meet contingencies has decreased over time as their asset base has become eroded, increasing their vulnerability. Droughts and floods destroy assets which are the very means for adaptation;
- Food insecurity as agricultural productivity is affected. Food availability and accessibility has been an issue since the noticeable increase in frequency and intensity of floods and drought;
- Shortening of *dimba*¹ gardening period due to either high or low water table. In the event of a flood the water table is high eventually delaying when communities can start working in the *dimba* gardens. Previously in most communities it used to be around April, but recently there have been delays and in extreme cases as late as August. Conversely, when there is drought the water table is very low, shortening the *dimba* gardening period;
- Over-reliance and too much investment in hybrid maize varieties eventually undermining attempts to diversify. Food security in Malawi is still largely defined by availability of maize. With shifts into early maturing varieties of maize, any efforts of diversify are meeting challenges;
- Limited access to social services as access roads and bridges have either been washed away or destroyed. Destruction of infrastructure

¹ A vegetable garden along a river or in low lying area usually with high water table - crops are usually grown in the dry season



A maize garden wilted due to lack of rains

makes it extremely difficult to get to produce markets and medical facilities; and

- Education affected as both pupils and teachers cannot be able to get to school – pupils and teachers cannot cross rivers, water gets into classrooms and sometimes flood victims seek shelter in classrooms.

Coping Strategies

The communities employ a number of coping strategies. It is widely understood that a number of the strategies are already what they were relying on during lean months of the year. However, with increased incidences of floods and droughts, the intensity of reliance on these strategies has also increased significantly. Some of the key coping strategies include:

- Small scale irrigation during the winter periods, growing crops such as maize, beans and a variety of vegetables. Basic equipment such as treadle pumps and watering cans are used;



Crops such as cassava are more tolerant to drought

- Food rationing, by reducing meal frequency to one a day as communities struggle to cope with food shortage. This may have diverse negative impacts on nutritional health;
- Selling livestock, such as chickens and goats and other household assets. Often these are sold at give away prices, but the consequence is economic impoverishment;
- Migration to trading centres and urban areas to seek employment; and
- Provide casual labor or piecework to those who are better off – this signifies that some members of the community are more vulnerable than others.

Adaptation Mechanisms

Communities are doing their best to adapt to the changing environment by building on local knowledge and diversifying their livelihoods. Some of the key adaptation strategies include:

- Changes in crop varieties for maize, rice, sweet potatoes as farmers adopt early maturing varieties;
- Crop diversification, moving into more drought tolerant crops such as sweet potatoes and cassava;
- Tree planting initiated, although on a small scale warranting expansion;
- Adjustments in timing of farming activities; and
- Increased dependence on *dimbag* gardening using fertile deposits in low lands, but there are environmental risks. Crops grown in these gardens include green maize and a diverse range of vegetables.

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