



An Assessment on The Impacts of Climate Change and Disasters- Case of Zomba

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ABSTRACT:

Climate change refers to short, medium, and long-term changes in weather patterns and temperature that are predicted to happen, or are already happening as a result of anthropogenic emissions of greenhouse gases such as carbon dioxide (IPCC, 2007). Malawi is no exception to the impacts of climate change. The climate change projections for Malawi made as part of the UNDP climate change country profiles and based on a similar approach as in the IPCC Fourth Assessment Report, predicts that the exposure to climate change in Malawi is likely to be mainly through changes in rainfall patterns and probably less through the amount of precipitation (IPCC, 2007, UNDP, 2009).

DISASTER: A disaster is an occurrence disrupting the normal conditions of existence and causing a level of suffering that exceeds the capacity of adjustment of the affected community. It is the people who matter most, and without the people we have no disaster. There are different types of disaster which can be classified as natural and man-made disasters and some examples of such disasters include: flood, stormy rains, drought and disease outbreak in the country. Disasters are serious disruptions to the functioning of a community that exceed its capacity to cope using its own resources. Disasters can be caused by natural, man-made and technological hazards, as well as various factors that influence the exposure and vulnerability of a community. However, despite the recognition, and wide adoption of climate change adaptation and disaster risk reduction as policy agendas, there have been limited reflections on the general impacts of climate change and disaster in the country.

Keywords: Climate change, Disaster Risk Management, disaster, Hazards, Vulnerability and community participation,

Introduction:

This paper aims to fill this gap by assessing the general impacts of climate change and disasters in Malawi specifically in Zomba district in TA Nkutumanji and Mwambo which are some of the areas that have been registering the negative impacts of such climate change and disaster annually. The study addresses eight major research questions. What are the long term impacts of climate change and disasters, what are the Climate change adaptation and disaster risk reduction programs in place to address the impacts of the climate change and disaster, what are the common hazards being experienced as a result of climate change, What are the underlying factors contributing to climate change and disasters in Malawi, What are the legal framework that governs the implementation of Climate change adaptation and DRR programs in Malawi. Lastly what are the interaction between climate change impacts (i.e. disasters) and development?

Malawi as a country has not been spared from the negative impacts of Climate change and disasters. The country has experienced Changes in climate as evident from the late 1990s to the present Most significant are changes in the start, length and quality of the growing season, increased frequency and intensity of climate-related disasters, esp prolonged droughts and flooding, sometimes in the season in the same areas. Heavy downpours, accompanied by strong winds, also leading to flash floods, e.g. the serious floods this season, including in Lilongwe here, a few kilometers west of here

Many indirect impacts, with complex relationships with many non-climatic factors □ The weakening global markets and global price of fuel has huge impacts on export markets for Malawi agro productions, and huge costs for transport to international markets given Malawi is land-locked. The effects of climate change has also contributed to Crop pest and disease outbreaks e.g. locust, army worms, Panama disease for banana, impacting on crop production.

On the other hand the country has been experiencing various types of disasters ranging from natural to man-made disasters which also pose huge negative impacts on the all thematic areas of development. Zomba being one of the districts in the southern part of Malawi has been experiencing the negative impacts of such disasters in the previous years hence the study sees the need to understand the impacts of such disasters on people as well as all aspects of development.

Nonetheless, most of the previous studies conducted Most of the studies conducted have had focus on the general impacts of the climate change and disasters without putting emphasis on the cause of climate change and disasters. This study will therefore specifically look into specific sectors/field affected by climate change as well as assess the root cause of climate change and disasters in Malawi-Zomba district.

Problem Statement

Zomba district is one of the district in the southern part of Malawi that experiences the negative impacts of climate change. Despite that there has been a number of programs in addressing the impacts of climate change and disasters, the district still more experiences the great impacts of climate change and disasters this is why the researcher in this study sees the importance of assessing the general impacts of climate change and disasters in the district specifically in the traditional authorities prone to disasters.

The researcher also understands that there has been cases of disasters in the various TAs due to climate change hence the need to assess the impacts of these disasters in the district in order to come up with the short and long term interventions that would reduce such impacts in the district. The researcher would also like to understand the common hazards that the district experience as a result of climate change impacts in the district so that to propose tangible intervention per hazard based on its magnitude of impacts, probability and likelihood of occurrence in the district.

The researcher also understands that despite the availability of various organization implementing Climate change adaptation and disaster risk reduction programs in Zomba but still more community participation towards CCA and DRR is not so positive hence the need for the study to investigate the cause or factors contributing to the situation.

Research Objectives

Overall objectives

- To assess the impacts of Climate Change and Disasters in Malawi specifically in Zomba district with focus on the Traditional Authorities prone to disasters

Specific Objectives.

The four specific study objectives formulated by the researcher to accomplish the overall research objective are as follows:

- To assess the factors leading to climate change and disasters
- To assess the interventions undertaken to address the impacts of Climate change and disaster in Malawi
- To assess the community participation towards the CCA and DRR programs in the district

Research Rationale or Justification

This research contributes to the existing body of knowledge in the areas of climate change adaptation and disaster risk reduction programs as well as their interrelationships. The data collected here and the insights gained will permit decision-makers to make better informed decisions in terms of developing, communicating, and implementing the appropriate climate change policies and strategies to successfully mitigate and adapt to the impacts of global climate change. While there is no single way to mitigate or adapt to the impacts of climate change, experience shows that measures are most effective when local communities are involved. In view of the government's and other stakeholders recognition and adoption of the important role communities can play in CCA and DRR, it is very important to assess the general impacts of climate change and disasters, knowledge, ability and participation of communities in areas of response to climate change and disasters. This is very crucial as it will assist government and other stakeholders to design effective adaptation and disaster risk reduction Programmes and even detect areas for capacity building in the communities. The knowledge would also assist in scaling up interventions to effects of climate change and also inform with appropriate funding mechanisms to CCA and DRR initiatives at local level. The study also highlights the challenges and complexity of participation and the issues that must be negotiated and addressed in order to enable successful community participation in CCA, DRR and sustainable development programs in general.

Scope of the study

According to Dawson (2004), the scope of the study is a philosophy or a general principle that guides the research. Hence with an increase on the impacts of climate change and disasters on people and all aspects of developments the researcher sees the importance of assessing the negative impacts of Climate change and disasters in Malawi specifically in the southern district of Zomba. The study will be implemented at district level covering all the TAs that have been experiencing these negative impacts of climate change and disasters. The study will also engage the concerned sectors in the field of climate change and disasters. In this case the researcher will have to take on board the department of environmental Affairs and Department of Disasters management officials so as to understand the previous and present effects of Climate and disasters in all the development schematics.

Study design

The research was designed to employ quantitative type of research in order to answer the research questions to understand the impacts of climate change and disasters in the Zomba district of Malawi. The research was designed to focus on the descriptive research of quantitative research to assess the correlation of the community at risk as well as understand the trends of climate change impacts and disasters in the Zomba district of Malawi. Basically the research has been designed to be carried in two Areas/ locations of Zomba district, these are the areas that have been experiencing the huge impacts of climate change and disasters based on the previous secondary data hence the study wanted assess what has been the magnitude of climate change and disasters in the areas.

In order to gather the data pertaining to the research questions as well as on the study topic, the research was designed to conduct a survey study that focused on collecting data from the targeted population through the questionnaires. A total of 110 participants or respondents was selected from a population 200076 to participate in this study from two different areas/location of Zomba district namely TA Nkutumanji and TA Mwambo

Total population

The study was conducted in two Traditional authorities of Zomba district namely Mwambo and Nkutumanji. Nkutumanji has a total population of **48079** and Mwambo **151997** making a total population of 200076. Basically, these are the Areas that have been experiencing the immense negative impacts of impacts of Climate Change and Disasters in previous years.

Population Size	Confidence Level (%)	Margin of error (%)
200076	110	10

Sample Size

Samples sizes

Calculation:

The researcher employed the fluid survey sample size calculator to determine the actual sample size for this particular research study. Hence below is the formula that has been used to come up with the sample size of 110 in the targeted Areas in Zomba district of Malawi

$$\text{True Sample} = (\text{Sample Size} \times \text{Population}) / (\text{Sample Size} + \text{Population} - 1)$$

$$=(110 \times 200076) / (110 + 200076 - 1)$$

$$= 22008360 / 200185$$

$$= 109.9$$

$$= 110$$

Sampling methodology

Research mainly used the probability type of sampling to collect the primary data meaning to say the respondents had equal opportunity of participating in the study. In this case the study employed Simple random sampling (SRS) which is a probability sampling method where researchers randomly selected participants from a [population](#). All population members had equal probability of being selected. This method of sampling enabled the researcher to produce representative, unbiased samples. For instance as indicated above the study has a total of 200076 population with a sample of **110** respondents hence in this case each person had a $110/200076=0.05$ probability. In addition, the researcher also used a random number generator to draw simple random sample for the study.

Data collection methodology

This study conducted survey in the targeted areas in order to collect the data from respondents, the researcher in this study formulated the open and close ended quantitative questions which were administered to the targeted population sample size (110 respondents) to collect the primary data from the respondents. The study also conducted interviews and Document review and secondary data collection in order to validate the data for ease analysis and interpretation.

Study finding

The study revealed that climate change and disasters are interlinked in the sense that most of the disasters that are being experienced today are as a result of issues of climate change. The study also showed that disasters have negatively affected the livelihoods of people in the areas that were targeted. For instance, the study indicated that due to disasters and effects of climate change crop production has declined in most communities hence resulting into food insecurity. In some cases lives have been lost due disasters triggered by climate change. For instance flooding and stormy rains which have also rendered communities homeless due to falling of houses.

Nevertheless, the communities also cited several impacts accruing from climate change and climate related disasters. Figure 4.2.2.4 presents a summary of the impacts cited by the respondents and the focus group members. These impacts include food insecurity, loss of household income, damage to infrastructure, disease outbreaks, changes in weather patterns, displacement of human population, environmental degradation, water scarcity, affects education service delivery and may lead to human deaths.

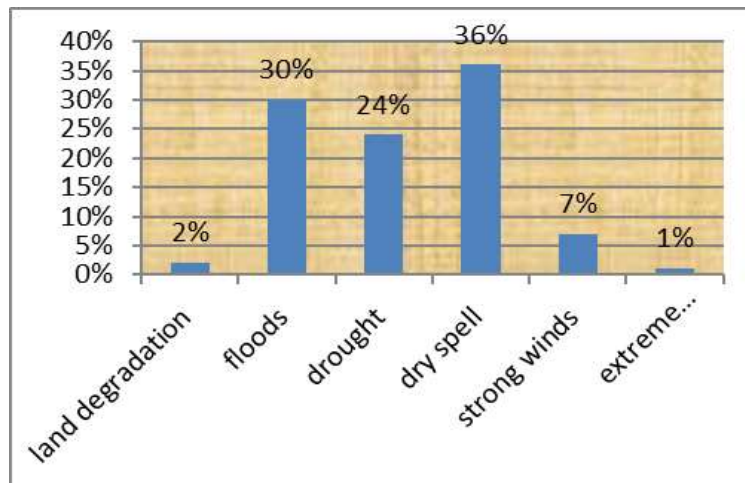
The study also has shown that communities have limited access to information as regards to climate change and disaster hence making it difficult for them to fully participate in the programs related to Climate change adaptation and disaster Risk Reduction in their localities. The research also has revealed that communities are not just powerless victims to climate change and disasters its related impacts; they employ several mechanisms to cope with the impacts of climate change and disasters. Figure 4.2.3.1 shows that *ganyu* (piece work) (16%) is the most common coping strategy employed by households to fend for their families in the face of climate change impacts (i.e. dry spells, drought and floods). In the discussions, it was learnt that this *ganyu* is mainly on agricultural activities (clearing gardens, planting, weeding, harvesting etc) and that it is seasonal, hence its availability is also prone to climate change. They argued that in a 'bad year' (a year with a shock like drought and dry spell) opportunities for *ganyu* would be limited. The other coping mechanisms cited were; reducing the number of meals (13%); winter cropping (11%); selling livestock (9%); eating less preferred foods (7%); small scale business (7%) and irrigation (6%).

Community members and key informants including NGO and Government officials also raised issues concerning community participation, the effectiveness, constraints and sustainability of the various project activities. It is important to acknowledge that almost all the issues and challenges raised are strongly interlinked and should not be considered as being derived from, or affecting, only one actor or the other. The outcome of the interviews and discussions are portrayed diagrammatically below, but I further categorize them in presentation and discussion.

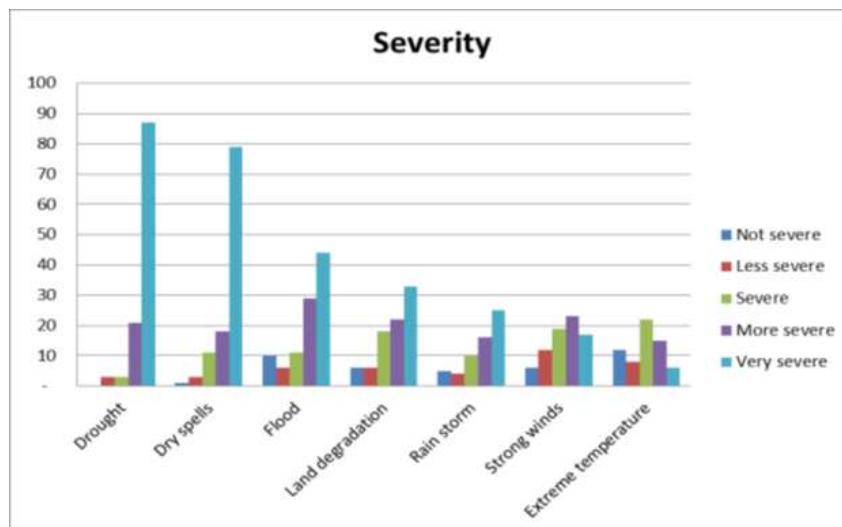
Table 4.3.3 Issues in Community Participation



Common hazards



In terms of hazards, Figure, above shows that dry spells (36%) were identified as the most common hazard followed by floods (30%), drought (24%), strong winds (7%) while land degradation and extreme temperatures were the least mentioned at 2% and 1% respectively. Suffice to mention that the terms drought and dry-spells were broadly defined. Analyzed by the targeted areas/villages, the results display some interesting variations which could be said to depend, to a large extent, on the topography and ecological characteristics of the areas visited. For instance, flood hazard was more pronounced in the village of Magoli (32 scores) than in the other two areas. Chaweza village rated dry spells (23 scores) as the most common while Namasalima rated drought and dry spells, almost in equal proportions, as the common hazards. Strong winds featured highly as a hazard in the household survey and discussion.



In terms of vulnerability, most respondents cited poverty (23%), followed by deforestation (21%) and the geographic location (18%) as the main factors influencing their vulnerability to climate change impacts as in Figure 3.2.2.3 below. Other equally important factors cited include lack of information/knowledge on climate change (9%), access to farm markets (6%), and land ownership (4%). These results highlight the extent to which communities think the socio-economic factors, political and other human actions interact in influencing their vulnerability to climate change. In the discussions, community members highlighted various human activities believed to be responsible for the changes in the climate as well as intensifying weather-related disasters especially floods, drought and dry spells. These included deforestation, poor agricultural practices that include slash and burn, cultivation of crops along river banks and overgrazing.

The findings have revealed that climate change and disasters have both short and long term impacts on peoples livelihoods. The study has shown that climate change has resulted into a number of disasters taking place in different communities, for instance due to climate change the following hazards have emerged dry spells, flooding, strong winds and disease outbreak. The research findings have clearly shown that there is also direct link between climate change and disasters in any environment setting for example the aforementioned hazards are mainly caused by the adversity of climate change. Above all the study findings have also shown that climate change and disasters are mainly triggered by human activities meaning that issues of climate change and disasters have been happening due to human activities on the environment.

The study therefore, recommends that there is need to review/come up with legal framework as regards to disaster management that would guide the implementation of Climate Change and Disasters management in Malawi.

There is also need to incorporate local knowledge in programming climate change Adaptation and Disaster Risk Reduction Program also installation of Early Warning System in all prone areas.

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