

## CLIMATE CHANGE MITIGATION AND ADAPTATION; THREATS AND CHALLENGES TO LIVELIHOODS IN ZIMBABWE

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### ABSTRACT

*Climate change is a topical issue and Zimbabwe in sub – Saharan Africa, has been experiencing a marked shift from its normal climate. Droughts are now more frequent and wet seasons shorter. Floods have also become more intense whenever they take place and this has threatened livelihoods of the poor people in the country. But those affected most by climate change are the same people who least understand the phenomenon. Climate change is also associated with other hazards such as land degradation, veld fires, and siltation. Essentially, all sectors of the society end up being affected. This paper, traces the capacity of Zimbabwe to handle climate related disasters in terms of mitigation and adaptation strategies as well as the gaps that exist in addressing climate related problems. This paper also analyses why a climatic phenomenon may come to be regarded as a hazard and why some people become vulnerable. Examples are extracted from Matabeleland, in South West Zimbabwe primarily because it is the region that is hard hit by unfavourable weather conditions.*

**Keywords:** Climate change, Vulnerability, disaster and risk reduction, livelihoods, adaptation, mitigation

### INTRODUCTION

Zimbabwe is a landlocked country in Southern Africa, sharing its borders with Mozambique to the east and north east, South Africa to the South, Zambia to the north, Botswana to the west and south west as well as Namibia to the west at the Caprivi Strip. The 2002 census puts Zimbabwe's population at 11 million, though 4 to 5 million more are thought to be living in Diaspora. Zimbabwe is multilingual and multicultural with English as the official language of instruction, ChiShona and IsiNdebele as the other national languages. Zimbabwe has a savannah type of climate characterized by hot wet summers and cool dry winters. It lies within the tropics and hence much of the rainfall results from the 'inter – tropical convergence zone' (ITCZ) and occasionally from tropical cyclones that originate from the Indian Ocean hence both droughts and floods are common hazards. However, of late the droughts have become more frequent,

persistent and the seasons short or less defined. This phenomenon has been attributed to climate change.

However climate change has always been a topical issue meaning different things to different people. IPCC (2001) refers to climate change as any change in climate over time, whether due to natural variability or as a result of human activity. Whilst the UNFCCC views climate change as “a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods. It is worthwhile to note that Climate change is fluid or is in a constant state of flux. It is a process that can be abrupt or long term. Thus “Climate change” refers to an *additional*, and relatively rapid, change induced by human actions. This additional change several degrees Celsius within a century can disrupt the foundations of life on Earth. However although the earth’s climate varies for whatever reason Society is trying to cope with a phenomenon that is ever is a constant state of change.

UNDP-UNEP (2011) contends that climate change does pose a risk to development and achievement of the Millennium Development Goals (MDGs). It also affects livelihoods, health and economic development. Thus this implies that a country’s adaptation response should be formulated as part of broader policies for development, including areas not directly related to climate change. This is because it is the poor people who are more vulnerable to hazards such as droughts or floods that can damage or destroy their crops, livestock, and homes. Thus indirect poverty alleviation such as enabling investment in better land management to improve soils helps mitigate against the adverse impacts of extreme weather events and increase resilience to those shocks (UNDP-UNEP 2011).

### **Climate related risks and hazards in Zimbabwe**

Zimbabwe is a landlocked country in Southern Africa, sharing its borders with Mozambique to the east and north east, South Africa to the South, Zambia to the north, Botswana to the west and south west as well as Namibia to the west at the Caprivi Strip.

Worldwide at least 70% of all disaster occurrences are weather associated. It is expected that continuing climate change processes will result in an increased frequency of extreme weather events. A number of natural disasters have hit Zimbabwe albeit at a small scale relative to disasters that hit other countries and regions in the world. Most natural hazards are of hydro meteorological in origin and these are floods, drought, lightning, and tropical cyclones. Notable disasters include the infamous 1991-1992 drought, flooding in the Zambezi Valley (Muzarabani and Dande) by Cyclone Eline in 1999. The drier parts of the country that is the Zambezi and the Limpopo valleys are the most vulnerable. However, natural disasters can be man-made aggravated through improper land management, lack of environmental awareness and disaster preparedness, ineffective application of the rule of law are key issues for policy makers addressing disaster reduction. The fortunate part is that disasters like floods, cyclones and veld fires, among others, have always caught the attention of the media and hence the protracted

attention now being given to climate change. The less frequent hazards though, floods and droughts, are the most devastating in their impact.

Table 1. Climate related hazard trends analysis profile of Matabeleland South province, Zimbabwe

Hazard Issue	Classification	Probability Of Occurrence In A Scale Of 1 To 10
Drought	Slow onset disaster	4
Floods, Lightning, etc	Rapid onset disaster	3
Land Degradation	Slow onset disaster	8
Veld Fires	Rapid onset disaster	9
Siltation of water bodies	Slow onset disaster	10

*(Adapted from the Matabeleland South Disaster Preparedness and Response Plan, 2006)*

Matabeleland South Province is part of the upper Limpopo Basin stretching for 515 km within the Province from Plumtree to Chituripasi. This part of the Limpopo Basin is not only prone to floods but droughts are quite common as well at times the whole season. Droughts are less dramatic than floods or cyclones because they build up gradually but they affect more people and arguably have a greater negative impact on the Province's economy. Cyclones are the rarest but deadliest hazard facing this part of the Limpopo basin. The basin as a whole lies outside the major tropical cyclone zone in the continent, but cyclones do occasionally affect the basin directly and this results in severe flooding as witnessed in 2000 during the passage of the Cyclone Eline. However hazard events and processes do not automatically result in disaster occurrences.

The Limpopo basin has suffered a number of severe floods in the last 50 years particularly 1955, 1967, 1972, 1975, 1977, 1981 and 2000. The floods of 2000 were by far the worst with water levels not seen since 1848. This could imply climate change in action. On the other hand, it is also true that while the occurrence of cyclones and consequent flooding are a natural phenomenon, the severity of flooding is also exacerbated by injudicious human activity. This is particularly true for the inhabitants of Shashi and Chituripasi who have settled and are conducting their farming activities in the upper Limpopo basin flood plain. The severity was exacerbated by poor land management, serious erosion of wetlands and overgrazing of grasslands in the upper reaches of the Limpopo Basin at Mphoengs, Madabe, Tshitshi, Ngwanyana and Plumtree.

### **Why livelihoods and mitigation?**

It is apparent that every society and societal group at some point or another is faced with hazards, be they technological, human, natural or man-made. These are potential threats to humans and their welfare (Twigg, 2004:12). From a developmental viewpoint, it is not so much the occurrence of the hazard that matters, but it is when the hazard results into a disaster. A disaster

occurs when the impact of a hazard on a section of society (causing death, injury, loss of property or economic losses) overwhelms that society's ability to cope. That is where the linkage between livelihoods and disasters comes into being. Development work aims to strengthen or buttress communities' resilience and capabilities in the face of shocks and stresses (disasters and hazards). Sound development practice should therefore put more emphasis on strengthening communities' capacity for coping with disruptions to their livelihoods (hazards and disasters), and this is better achieved by adopting the livelihood centred approach that puts people's context at the centre of analysis and also to inform development interventions. The Sustainable Livelihoods framework focuses on the impact of different policy and institutional arrangements upon people/households and upon the dimensions of poverty they define. In Disaster Management terms, this entails disaster management and response plans that are indicative of the wishes and priorities of grassroots people and should be more of a bottom-up approach instead of the conventional top-down approach.

Human societies have always been engaged in various forms of livelihoods to sustain themselves and support their cultural heritage. Livelihoods "*comprise the capabilities, assets* (including both material and social resources) and activities required for a means of living (Farrington, Carney, Ashley and Turton 1999). A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base (Chambers and Conway 1992). The Sustainable Livelihoods approach therefore puts people at the centre of development. It starts with an analysis of people's livelihoods and how these have been changing over time. Disaster Mitigation is the term used to refer to all actions to reduce the impact of a disaster that can be taken prior to its occurrence, including preparedness and long-term risk reduction measures. It includes both the planning and implementation of measures to reduce the risks associated with natural and man-made hazards, and the process of planning for effective response to disasters which do occur (Coburn et al, 1994). Disaster mitigation is one of the four phases in the Disaster Management cycle comprising of Mitigation, preparedness, response and recovery. Mitigation activities actually eliminate or reduce the probability of disaster occurrence, or reduce the effects of unavoidable disasters. Mitigation measures include building codes; vulnerability analyses updates; zoning and land use management; building use regulations and safety codes; preventive health care; and public education.

The livelihoods approach attempts to identify the most pressing constraints faced by, and promising opportunities open to, people regardless of where (i.e. in which sector, geographical space or level, from the local through to the international) these occur. It builds upon people's own definitions of these constraints and opportunities and, where feasible, it then supports people to address/realize them. Community based planning and management approaches are critical in disaster management from a livelihoods point of view. Long-term livelihood strengthening can be part of pre-disaster mitigation strategies, integrated with development work.

Shorter-term disaster preparedness initiatives can include steps to protect material assets, or move them to safety as part of contingency planning (Twigg, 2004:54).

In short therefore, the Sustainable Livelihoods framework helps highlight the fact that communities engage in their livelihoods under different types and levels of vulnerability (vulnerability context), with disasters being among some of the shocks and stresses that communities go through. It therefore draws attention to how policies and institutions, vulnerability context, livelihood assets, strategies and outcome interrelate in weaving and shaping a particular kind of societal context.

It is increasingly becoming apparent that planning and preparedness, prevention, mitigation, response and relief, and recovery, to tackle disasters are critical in order to reduce the negative impacts and effects of such events. The consequences of physical damage are more important than the damage itself. Damage to infrastructure and to the means of production depresses the economy (livelihoods) and disrupts social institutions. Thus the role of communities and individual families in taking appropriate mitigation action to hazard impacts has been emphasized, as local governments and emergency services realize that response to an emergency situation can be hampered by the disaster itself, and relief can best be delivered by those closest at hand. Community-based disaster management is now becoming an integral part of any local or national disaster management planning,

### **Managing disasters in Zimbabwe.**

Disaster management in Zimbabwe is largely biased towards emergency response rather than mitigation. The tendency has been to wait and then start scurrying around for resources after a flood or cyclone has hit communities. There is a Department of Civil Protection housed under the Ministry of Local Government, Public Works and Urban Development.

In Zimbabwe, mitigating climate change related risks and disasters, particularly droughts, has been carried out at two levels that is, the Individual or household level, and the public or national level. At individual level, efforts have centred on crop diversification, the growing of drought tolerant crops, and the sustainable use of wetlands. People in drought prone areas have also been encouraged to turn to small scale irrigation as an alternative to rain fed cropping. Instead of discussing climate change, a concept that many people from communal or rural areas would find it difficult to digest, agricultural extension officers have been stressing on a good choice of dates for planting crops. Thus farmers have to chose dates wisely or else change to short season varieties. Interestingly, there has also been a marked change in behaviour by farmers in Zimbabwe as they seek to transfer risk. It is now a common practice for farmers to insure their livestock and crops. This has been hastened by increasing uncertainties of the weather phenomenon. At national level, the effort has been on the utility of the Early Warning System (EWS). The Zimbabwe Meteorological Services usually provides a pre-season assessment and another one midway into the rainy season. These press releases are meant to help the farmers make informed decisions about an impending growing season and hence maximise returns.

However the public policy is much more complex and broad and its success hinges on the interplay of other various policies such as environmental, land-use, agricultural and education & training policies.

The government of Zimbabwe has also taken steps to replace the law that governs disaster and risk preparedness that is the Civil Protection Act. It is set to be replaced by the Emergency Preparedness and Disaster Management Act that will see the establishment of an Emergency Preparedness and Disaster Management Authority. The Authority will have as its main mandate to develop risk reduction strategy in order to minimize vulnerability to both natural and man induced hazards. Under the proposed new dispensation, Disaster Management will be built into the Education curricular. In the event of a disaster or emergency in Zimbabwe, the National Civil Protection Coordination Committee leads the process of response. At the helm and playing a coordinating role is the UN's Disaster Management Team. This team coordinates donor activities to avoid duplication of effort and resources. Through the Department of Civil Protection, the country has in the past conducted a multi-sectoral hazard and vulnerability mapping exercise throughout the country. This map has not however been proactively availed to the public. The reason could be as suggested by Holloway (2003) that since the same maps are used for relief operations political interference could have complicated the process. In contrast to that, in the past leadership gave primacy to disaster relief, responsible governance today prioritizes opportunities to reduce disaster risk through partnership, and not relations characterized by patronage and dependency.

### **Gaps in mitigation strategies?**

Disasters like flooding have rarely had direct costs such as human lives in Zimbabwe. Costs have mostly been confined to damaged livelihoods, hence responses to such disasters have largely been reactive than proactive. This short sighted response is despite that damaged or disrupted livelihood systems take time to rebuild and mend. There is currently a heavy bias towards emergency response and relief. Not much has been done in the area of disaster mitigation. Following major droughts (1992 and 2003) and the resultant livestock losses, focus has largely been on restocking efforts without addressing the critical issue of carrying capacity, sustainability thresholds and the ecological footprint of large numbers of livestock in a context of diminishing grazing area.

Although a multi-sectoral hazard and vulnerability mapping exercise was undertaken, its results largely have circulated particularly to the grassroots communities who are the most affected and therefore logically the most in need of such information. The challenge has been how to package the information so that it is easily understood and utilized by such grassroots communities.

Another challenge is the fragmented nature of pieces of legislation dealing with disaster management and above all the weaknesses of the Civil Protection Act. It is apparent that environmental disasters affect people, more than anything else. However, in Zimbabwe, disaster management and environmental management are handled as separate entities. Under the current arrangement presided over by the Civil Protection Unit, it is the central government that initiates hazard reduction measures through relevant ministerial sectors. This is complicated by the fact that the Department of Civil Protection is housed under the Ministry of Local

Government, Public Works and Urban Development and instead of the Ministry of Environment and Tourism. There is need to rethink this arrangement in the light of coordination, attitudes, and accountability. .

Although there has lately been an acknowledgment of community early warning system based on indigenous knowledge systems, these have not been properly documented and widely shared. The interface between the scientific and the traditional still requires more negotiation. Indigenous knowledge systems on seasonal rainfall predictions have been documented for many parts of Zimbabwe.

There is a striking similarity between some of the indigenous and contemporary climate indicators especially those related to wind direction, temperature and clouds. Observations of plant and animal behaviour dominate indigenous climate forecast systems in many parts of the country. Inter-annual fluctuations in fruit production in certain tree species have been used as an advance seasonal rainfall indicator. Animal behaviour is also used to predict weather conditions.

At political level, it looks like it is a question of priorities. Like in most low-income countries, in Zimbabwe developmental priorities are still placed on health, job creation and education than on environmental protection and hence disaster mitigation and adaptation strategies receive comparatively lower priority in national policies and development plans

## CONCLUSION

It has been accepted that not all disasters have negative impacts. Some extreme climate events such as cyclone Eline had positive impact or beneficial impact on the local environment in Zimbabwe. Flood plain vegetation was rejuvenated and dams were filled to capacity making available adequate water for both irrigation and use in urban areas. Some cities boasted of having more than two years supply of drinking water. Thus a 'disaster' may also have beneficial ecological consequences. However, these benefits tend to manifest themselves only months or years after the event, for example recharging of groundwater stocks after a flood. Thus Zimbabwean disaster management agencies need to invest more time and resources in understanding the dynamics of disasters and their aftermath. For climate change mitigation efforts to pay off there is need to promote such activities in such a way that the community buys-in ownership and that ensures sustainability of the exercise. As long as solutions are imposed, communities may remain alienated to life saving knowledge and at times remaining superstitious. Thus instead of appreciating and embracing the technology of lightning conductors, such knowledge is greeted with suspicion. In short Disaster Mitigation plans need to be incorporated or packaged into development projects so that they can easily accommodate disasters that may befall communities. Developing separate or standalone disaster management plans could be counterproductive.

There is thus, need to implement projects which reduce communities' vulnerability to natural hazards there by strengthening community livelihoods. The media could be engaged to play a more significant role in dissemination of information from assessments, policies and strategies relevant to vulnerability.

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