

Natural Hazards as Disasters: Mitigation and Challenges in Southern Zimbabwe

¹Nkululeko Joshua Ndiweni and Charles Musarurwa

¹Department of Geography and ²Population Studies,
Lupane State University, Zimbabwe.

²Department of Languages and Social Sciences Education,
University of Botswana.

Corresponding Author: Nkululeko Joshua Ndiweni

Abstract

This position paper focuses on drought related disasters in southern Zimbabwe. Generally, the so-called natural disasters (drought included) are in many instances a result of a complex range of factors that include not only natural causes, but human-induced climate change as well. This has resulted in increased frequency and magnitude of weather related hazards such as droughts, tropical cyclones, heat waves and floods. However, southern Zimbabwe in particular is normally hit by droughts claiming livestock, reducing food production, thus perpetuating food insecurity and triggering increased migration. This increased vulnerability is compounded by the fact that economically southern Zimbabwe is a peripheral area that has experienced minimal development. Furthermore, the local communities of the region lack relevant drought mitigation skills and resources. If community preparedness and building resilience are to be effectively inculcated to mitigate drought related disasters in the region, then a sustained effort is needed to strengthen research by linking scientists, practitioners and policymakers in order to show how climate change influences vulnerability. Therefore the purpose of this paper is to explore drought mitigation challenges in southern Zimbabwe and how poverty, high population growth and how land use in these marginal and fragile areas have increased human vulnerability to this type of disaster. This is significant in that planners and policy makers will manage to build resilience in affected communities and redress environmental degradation and desertification.

Keywords: Natural hazards and disasters, drought, vulnerability, mitigation, adaptation and resilience.

INTRODUCTION

Over much of the earth's history, climate has been varying from warm to cold and from wet to dry and back again (Tarbuck and Lutgens, 2010). This spatial and temporal variation in climate is associated with natural hazards such as tropical cyclones, droughts, heat waves and floods. The objective of this study is to explore challenges for drought mitigation in southern Zimbabwe, i.e. those conditions of the people that make it possible for a drought to become a disaster. In other words, it will be shown how so-called natural disasters (drought) are in many instances the result of a complex range of factors than just natural causes. Anthropogenic activities have intensified the rate of climate change and increased the frequency and magnitude of natural hazards. The Inter-governmental Panel on Climate Change [IPCC] (2012) states climate change may be due to natural internal or external processes or to persistent anthropogenic changes in the composition of the atmosphere or land use. Human activities have speeded-up climate change such that it is very difficult for vulnerable groups to cope with the change. According to Smolka (2006), the frequency of major natural catastrophes is increasing. This assertion has been reinforced by IPCC (2012) when it states that a changing climate leads to changes in the

frequency, intensity, spatial extent, duration and timing of extreme weather and climate events and can result in unprecedented extreme weather and climate events. Thus one can argue that, in the present is the time of increasing vulnerability to extreme natural hazards, as people occupy marginal areas due to high population growth and over reliance on natural resources. Vulnerability refers to the propensity of exposed elements such as human beings, their livelihoods and assets to suffer adverse effects when impacted by hazard events (Thywissen, 2006).

Economic activities have led to the alteration of the atmosphere due to the burning of fossil fuels. Agricultural activities have led to the reduction of carbon sinks as land is cleared for cultivation. When the land is bare carbon stored in soil is released. Deforestation continues to contribute to global warming and is a major cause of the greenhouse effect (African Ministerial Conference on the Environment [AMCEN], 2011). Industrial and agricultural activities have led to the emission of large quantities of greenhouse gases such as carbon dioxide and trace gases (methane, nitrous oxide and chlorofluorocarbons). According to a 2007 report by the IPCC, the atmospheric concentrations of carbon dioxide in 2005 exceeded, by far, the natural range

(180-300ppm) over the past 650 000 years (Tarbuck and Lutgens, 2010). Greenhouse gases form a blanket-like layer in the lower atmosphere, thereby trapping outgoing terrestrial radiation and leading to the warming of the lower layers of the atmosphere which is referred to as global warming. The warming has accelerated due to high concentrations of greenhouse gases from factories, automobiles and agricultural activities. Global warming has triggered a high frequency, magnitude and intensity in extreme weather events. A warmer earth has more energy and models of the atmosphere suggest more extreme events (IPCC, 2012). However, the question of whether global warming can cause increases in extreme weather events is still unresolved (Karl et al, 1997 and Mitchell et al, 2006).

An increase in extreme weather events has been accompanied by an increase in poverty in most developing countries, especially in sub-Saharan Africa since poor communities are more vulnerable to these natural hazards. When natural hazards negatively impact on disadvantaged communities they are referred to as natural disasters. Extreme weather and climate events, interacting with exposed and vulnerable human and natural systems, can lead to disaster (IPCC, 2012). Southern Zimbabwe is highly vulnerable to droughts and according to AMCEN (2011) the underlying cause is climate change. The area is drier, with an average rainfall of 450mm or less per year. Studies have shown that every three to five years the zone is affected by a drought reducing both harvests and pastures. The Zimbabwe Vulnerability Assessment Committee [ZimVac] (2010) outlines that the livelihoods in this zone are characterized by animal husbandry, mainly cattle rearing as well as limited food and cash cropping. A typical better off household owns 30-40 cattle, around 40 goats and sheep, maybe some pigs and 4-5 donkeys (ZimVac, 2010). Erratic rains are a barrier to sustainable agriculture and other livelihood options. Droughts are very rampant as they have led to the death of large numbers of livestock per year and cause crops to fail thereby leading to food insecurity and the famines. According to the figures released by the Department of Livestock Production and Development in the province, 12 721 cattle were lost in 2012 due to poverty-induced deaths, Mangwe district had the highest number of casualties (6 885) followed by Matobo (1 885), Bulilima (1 436), Beitbridge (1 015), Gwanda (812), Insiza (665) and Umzingwane (23) (Nsingo, 2013).

Human vulnerability to natural hazards is spearheaded by unequal development. Extreme poverty makes it very difficult for people to withstand natural hazards, thereby turning these hazards into disasters with catastrophic consequences. The character and severity of impacts from climate extremes depend not only on the

extremes themselves but also on exposure and vulnerability (IPCC, 2012). On the other hand, as stated by Kofi Annan in Fara (2001), it is human behaviour that transforms natural hazards into what should be called unnatural disasters. The impacts of drought are exacerbated by human activities such as deforestation, overgrazing and poor cropping methods, which reduce soil water retention and improper soil conservation techniques, which lead to soil degradation (AMCEN, 2011). It is, therefore, the aim of this study to explore challenges for drought mitigation in southern Zimbabwe. The study will focus on those conditions of the people that will make it possible for a drought to become a disaster. In other words, it will be shown how so-called natural disasters (drought) are in many instances the result of a complex range of factors than just natural causes.

STATEMENT OF THE PROBLEM

The problem is lack of socioeconomic development, marginality, inaccessible information related to early warnings, response strategies, coping and adaptation mechanisms, drought mitigation is also a challenge because it is very difficult to determine its onset, extent and end and is commonly the result of a number of factors and the other challenge for drought management is that mitigation measures are a relatively low priority for African decision-and policy-makers, however, as hazards and disasters often pale into insignificance when compared to other pressing issues such as poverty and HIV and AIDS. These factors have increased human vulnerability to droughts in southern Zimbabwe.

1. Limitation of the study

The major constraint on this study was that it focused on one out of the ten regions of Zimbabwe; hence, generalizations of the findings would be limited. However, the approach undertaken by the researchers was so open to the extent that it could be repeated and applied in any geographical region in Zimbabwe and across the globe with more or less similar results achieved.

NATURAL DISASTERS IN CONTEXT

Human activities ranging from anthropogenic climate change at one extreme (Mitchell et al, 2006) to local deforestation and changes in land use at the other (Wheater, 2006) have exacerbated human vulnerability to natural hazards. In addition, low socio-economic development has increased human vulnerability. Therefore, natural hazards have turned into natural disasters due to their negative effects on communities in sub-Saharan Africa. Southern Zimbabwe is more vulnerable to droughts as more people have occupied marginal areas which are very fragile when agricultural activities such as crop cultivation are introduced. This occupation of marginal lands has been necessitated by high population growth.

Nelson (2013) points out that a natural hazard is a threat of a naturally occurring event that will have a negative on humans and the effect of a natural event is what is referred to as a natural disaster. Therefore, when the hazardous threat occurs and harms humans, then the event becomes a natural disaster (Nelson, 2013). Although it is a naturally occurring hazard, but because it has a negative effect on humans it then becomes a natural disaster. There would be no natural disasters if it were not for humans, in other words, without humans these are only natural hazards or events (ibid). In areas where there are no human interests, natural hazards do not result in disasters (Burton et al, 1978).

Disasters severely alter the normal functioning of a community or society due to hazardous physical events interacting with vulnerable social conditions, leading to widespread adverse human, material, economic or environmental effects that require immediate emergency response to satisfy critical human needs and that require external support for recovery (IPCC, 2012). Natural disasters disturb the normal functioning of a given community and it is highly felt in vulnerable societies with low socio-economic development. The disruption would be beyond the coping capacity of the community affected. According to Fara (2001), social, political and economic factors are the main causes of disasters since they directly influence the vulnerability of the populations at risk. Developing regions are more vulnerable as they tend to lack assets which assist them to be resilient to these disasters. It is the poor people who often find themselves in the path of disasters and who have very few, if any, resources to overcome the impact of disaster events (Fara, 2001). This means that the impact of hazardous weather events depends upon the economic health of the region or country (Redmond, 2002).

DISASTERS IN SOUTHERN ZIMBABWE

Southern Zimbabwe covers agro-ecological regions IV and V which are more suitable for cattle and game farming than crop cultivation. Annual rainfall is usually below normal, an average of 450mm or less per year. The region is characterized by frequent droughts and hence most livelihoods there are characterized by animal husbandry – mainly cattle rearing as well as limited food and cash cropping (ZimVac, 2010).

This high frequency of droughts in southern Zimbabwe has greatly disrupted human livelihoods, especially cattle production. Most households have lost their livestock due to shortage of water and disappearance of rangelands. It has also led to the shrinking and drying of surface water bodies and lowering of water table hence the drying of most boreholes. The scarcity of water in the area has thus precipitated a fall in agricultural production, thereby

leading to food shortages and food insecurity. In the final analysis this has greatly affected the health of both people and animals rendering them vulnerable to diseases and ill-health.

The seasonal variation of rainfall and frequent dry spells of increased magnitude have led to the wilting of crops resulting in below average harvests. Where crops have been seriously affected by drought, pasture production has also been reduced (AMCEN, 2011). This is explained by the fact that fodder supplies from crop residues are lowered when a drought is experienced and this exacerbates the shortage of food for livestock. Death of livestock is imminent when water and food become scarce. Farmers who sell their animals on local markets tend to fetch low prices because the quality of animals is highly affected by drought. When droughts occur, poverty is entrenched as resources get depleted.

Lack of water which is a characteristic of drought also becomes a springboard for outbreak of diseases such as typhoid, cholera and diarrhea, making it difficult for the country to meet the United Nations' Millennium Development Goal number four. Once drought strikes it means less irrigation for crops, less drinking water and less hygiene and an increase in the risk of the spread of infectious diseases, particularly polio, cholera and measles (AMCEN, 2011).

Although households in southern Zimbabwe who have lost cattle due to drought have developed feedlots as a mitigation measure, it has been difficult to effectively implement this adaptation strategy as most people lack financial resources to purchase relevant inputs. Vicente-Serrano et al (2012) point-out that the main constraints for the lack of implementation of such a strategy are weak institutional structures, lack of technical capacity, limited progress in mobilizing stakeholder participation and investment, and lack of in-depth understanding of the benefits of effective drought management for poverty reduction and economic development and lack of a preparedness culture. As people lack the capacity to resist droughts, they become highly vulnerable. Thus drought as a disaster has caused a decrease in cop productivity, unemployment, impoverishment and even forced migrations in southern Zimbabwe (Scheffran et al, 2012).

Managing droughts in southern Zimbabwe: The challenges

Vulnerability is when human beings are susceptible to natural hazards and is a result of various contributory factors cutting across temporal and spatial scales of economic, social, geographic, demographic, cultural, institutional, governance and environmental nature. Individuals and communities

are differentially exposed to and their vulnerability is based on inequalities expressed through levels of wealth and education, disability and health status, as well as gender, age, class and other social and cultural characteristics (IPCC, 2012). Drought vulnerability, which is the limited ability of a system to cope with drought, is determined by its resistance and resilience to water scarcity (Vicente-Serrano et al, 2012). Southern Zimbabwe is highly vulnerable to droughts as shown by high food insecurity in the region and outward migration to neighbouring countries such as, South Africa and Botswana. There is also high loss of livestock due to hunger and water shortages. Studies have shown that food security levels and grazing resources for livestock are expected to move from “emergency” to “crisis” levels. This is exacerbated by high frequent droughts. Droughts have weakened the livelihoods of most households thereby also weakening the economic base of the region. This has led to high poverty levels increasing vulnerability of the people to drought disasters. Poverty and vulnerability to droughts is a vicious circle because when these two elements intensify, they aggravate each other, leading to inexorably worse situation. Most dry lands in Africa are poverty hotspots; the risk of desertification is high in many of those areas, as the poor inevitably become victims and willing agents of environmental damage and desertification (AMCEN, 2011). It is further stated that unsustainable farming systems, such as continuous cultivation without adding supplements, overgrazing, poor land management practices, lack of soil and water conservation structures and high prevalence of uncontrolled veldt fires lead to land degradation and aggravate desertification (ibid). Under privileged communities have limited livelihood options and they are forced to exploit marginal areas that are very fragile and this precipitates desertification. Many rural livelihoods are reliant to a greater extent on the environment and natural resource base (Scoones, 1998), and natural hazards can impact severely on the agricultural sector (Saldana-Zorrilla, 2007).

Southern Zimbabwe is vulnerable to droughts because of marginality. The region is in the periphery and there is limited economic growth and development. The most reliant source of livelihood is agriculture. Other sectors such as industry and commerce have not been fully developed. Development in the country is concentrated in the core, which is Harare the capital city. Periphery areas are neglected and they have not been empowered with assets for survival. O’Keefe et al in Fara (2001) argues that, as population continues to expand and as resources continue to be controlled by a minority the real standard of living drops for much of the world’s population thus increasing their vulnerability. Bankoff (2004) further states that, vulnerable groups are not only at risk because they are exposed to a

hazard but as a result of marginality and access to resources. Increases in socioeconomic inequalities spearhead vulnerability to hazards of lagging communities. Neglected areas lack the capacity to resist natural hazards and they end up becoming highly susceptible to these hazards.

Lack of access to information related to early warnings, response strategies, coping and adaptation mechanisms has, also, increased vulnerability to drought (IPCC, 2012). Poor people have limited access to vital information and this is critical for reduction of vulnerability and increasing resilience. The poor are hard-hit by disasters because of lack of accessible information. Behaviour change is also vital when people get access to information because it is not information per se that determines action, but how people interpret it in the context of their experience, beliefs and expectations (IPCC, 2012). This implies that people have to be educated about these hazards and disasters from an early age for them to appreciate coping and adaptation mechanisms and increase their resilience.

Drought mitigation is a challenge because it is very difficult to determine its onset, extent and end and is commonly the result of a number of factors (Vicente-Serrano et al, 2012). Both physical (El Nino events) and anthropogenic factors contribute to the occurrence of droughts. It is, therefore, difficult to mitigate droughts since they are a result of multi-factors. Some locals have adapted to the use of indigenous weather forecasting strategies, however, they are a challenge in that most of the biotic elements of the environment such as birds and vegetation are now scarce and extinct due to climate change and desertification. The other drawback of indigenous weather forecasting strategies is that the knowledge is only possessed by a few elders and most people no longer subscribe to indigenous knowledge systems. The other challenge for drought management is that mitigation measures are a relatively low priority for African decision-and policy-makers, however, as hazards and disasters often pale into insignificance when compared to other pressing issues such as poverty and HIV and AIDS (ICSU, 2007). This implies that disaster preparedness is very low due to poverty and people are least equipped and prepared to cope with the impacts of hazards and disasters.

CONCLUSION

In the foregoing discussion it is highlighted that the peripheral nature of southern Zimbabwe exposes it to the devastating effects of natural disasters. An increase in the number of disasters and losses is due to high levels of vulnerability. Vulnerability is determined by the condition of the people which makes it possible for a hazard to become a disaster. Socioeconomic development improves people’s

resilience to disasters. Therefore, governments should pay more attention to the development of national strategies and policies that focus on infrastructural, environmental and human development for drought mitigation. Sound development practice should put more emphasis on strengthening communities' capacity for coping with disruptions to their livelihoods (Musarura and Lunga, 2012). Sustainable agricultural production such as improving farming skills, promoting rural finance and irrigation methodologies should be initiated and developed since it is a basic livelihood in rural areas. This would promote land management practices and redress desertification.

Governments should support programmes that encourage the cultivation of drought tolerant crop varieties such as rapoko, sorghum and millet in order to ensure food security. There is a need to strengthen research institutions by linking scientists, practitioners and policymakers in an effort to understand how climate change influences vulnerability in the region and the multidimensional role of the environment in the context of disasters (AMCEN, 2011). Sustainable adaptation strategies should be developed and implemented. Therefore, in order to reduce drought vulnerability, stakeholders should be actively involved in promoting a holistic conception of drought management. Research has shown that in order to reduce communal farmers' vulnerability to drought, socioeconomic interventions rather than hazard mitigation measures are required.

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