

Drought conditions and management strategies in Zimbabwe

S. S. Nangombe

Meteorological Services Department, Harare, Zimbabwe, ssnangombe@yahoo.com

Background:

Agriculture in Zimbabwe contributes to 19% of the country's GDP. Approximately 80% of Zimbabweans depend on this agriculture which is mostly rain fed for their livelihoods (Madzwamuse, 2010). Once, Zimbabwe was a food exporting nation with the country recording surpluses in food production almost every year. In recent years, the nation's crop production largely declined and one of the main contributing factors of this has been attributed to erratic and sub-normal rainfall amounts. Over the past decade, the amount of rainfall the country receives has deviated from the multi-decadal mean on a regular basis (UNEP, 2010). On the later part of the 20th century, runoff in the country decreased by 20 to 30% (MMET, 1998).

Of late, droughts have been crippling the nation and have contributed to the already low life-expectancy levels and high levels of emigration. During the drought of the 1991/1992 season, for example, maize production decreased by almost 75 percent leaving a large percentage of the population in dire need of food aid. The Grain Marketing Board (GMB) domestic maize intake during the 1992 drought year was about 13 000 tonnes - just enough for two days consumption for the nation. Over one million head of cattle died of starvation during the year. Drought returned in 1993 and 1994 2002, 2004 and 2012 seasons which also affected livelihoods. . The 2012 drought saw a deficit of approximately 45 per cent in the nation's staple food source, maize, (*FDI Global Food and Water Security Research Programme, 2012*). About 1.4 million Zimbabweans faced famine in 2012 (*FDI Global Food and Water Security Research Programme, 2012*). The cumulative occurrence of these droughts in rural Zimbabwe since 2002 has culminated in the stagnation of rural livelihoods which have enormously been agro-based. This deliberation has not only entrenched rural poverty, but, has seen the introduction of new strategies such as conservation farming and food handouts, all of which have failed to usher into a comprehensive remedy primarily because of the palliative nature of the solutions.

Table 1: Droughts in Zimbabwe between 1950 and 2013

Grade	Extreme Drought	Severe drought	Mild drought
Flood/Drought years	1983, 1992	1968, 1973, 1982, 2004	1951, 1960, 1964, 1965, 1970, 1984, 1987, 1991, 1995, 2002, 2003, 2005, 2007, 2008, 2009, 2010
Total	2	4	16
	3.3%	6.7%	26.7%

Although the bulk of the drought years were mild drought, this also had an effect on the people's livelihoods, especially in rural areas.

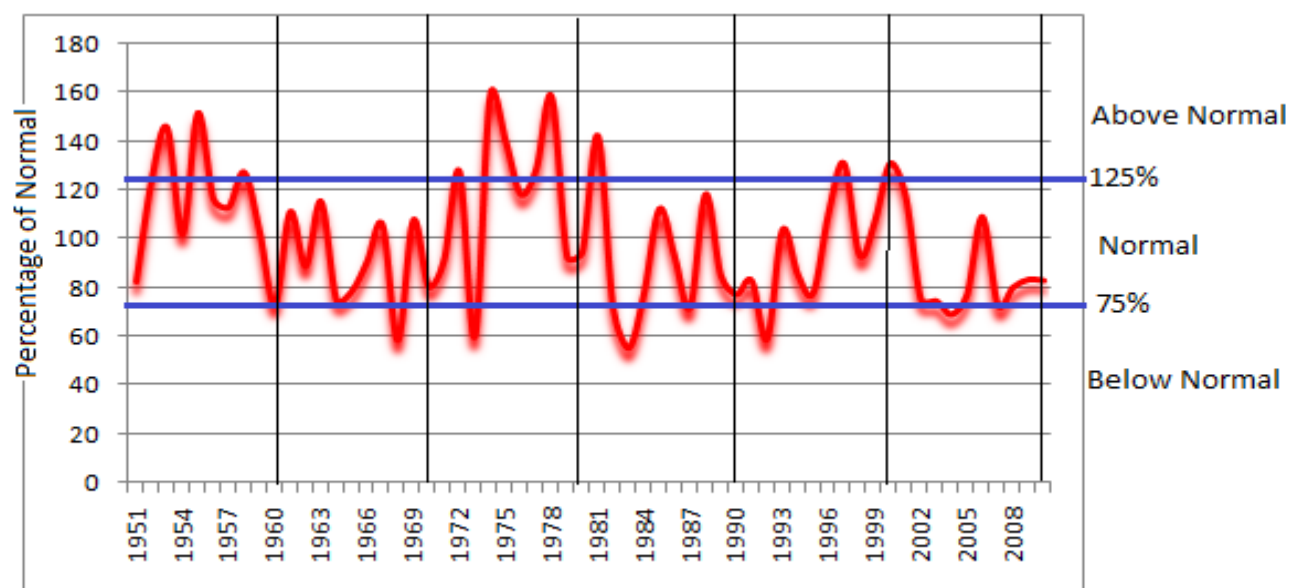


Fig 1: Time series showing the extreme rainfall years in Zimbabwe

The last two decade 1990-2000 and 2000-2010 shown in figure 1 had more years in the drought category than other decades.

Drought monitoring and early warning systems:

Drought monitoring in Zimbabwe is carried out by two main ministries, the Ministry of Environment, Water and Climate through the Meteorological Services Department (MSD) and ministry of Agriculture through Agriculture Research and Extension Services (AGRITEX). The roles and responsibilities of the two organizations include systematic observation and monitoring of hydro-meteorological parameters; provision and publication of information, forecasts, products and services related to weather and climate. Also these departments are responsible for the supply of data related to drought-relevant parameters, indices and indicators. The early warning system for drought in Zimbabwe at the national level is not very effective if not non-existent. This is the most overlooked area since so far there is no substantial establishment of a visible structure to that effect, yet it is the starting point for drought preparedness. It follows that if there are effective monitoring and drought forecasting, then adaptive capacity can be enhanced

hence the management program becomes proactive rather than reactive. It was only on paper but has not been put into practice.

The Meteorological Services Department provides early warnings to the people for drought from the time it starts disseminating the seasonal forecast. The seasonal forecast is generated by southern Africa regional climate experts together through the regional forum called the Southern Africa Regional Climate Outlook Forum and disseminated in August prior to the rainfall season. Each member state then downscale the regional forecast to their national level. Then the drought status is monitored as a continual process as the season progress hence this can pick out the intra-seasonal droughts that may have been missed by the seasonal forecast. The MSD uses the Standardised Precipitation Index which qualifies the severity of droughts in drought monitoring. AGRITEX also does drought monitoring by going further into getting the water requirement for the crops and livestock through the use of temperature, soil quality, evapotranspiration and rainfall. They mainly use the Water Requirement Satisfaction Index (WRSI) in drought monitoring. It is these two institutions who will advise the government on the country's drought status and also are both members of the Zimbabwe's National Early Warning Unit (NEWU) which makes coordination and dissemination of information efficient.

Vulnerability assessment:

Zimbabwe's drought vulnerability situation is represented every year through the Zimbabwe Vulnerability Assessment (ZIMVAC) report which outlines the vulnerability areas and groups. Droughts have been by far the most significant threat to Zimbabwe compared to other natural disasters with huge economic, environmental and social costs. Agriculture (crop, livestock forestry and fishery), depends heavily on water hence if sub-normal rainfall is received, it may consequently lead to loss in crop yields or livestock production and increase in insect infestations, wind erosion or forest fires which all have serious negative effects on the national economy.

The agricultural sector is usually the first one to be affected by droughts, given its dependence on soil and water, which can be rapidly depleted during extended dry periods. The approximately 80% of the total population which depends on agriculture in Zimbabwe are the ones most susceptible to shocks from drought occurrences. More than half of the population live in rural areas where the general quality of living is low and are less prepared to deal with problems brought about by droughts. Moreover, it's the children and woman who are most affected as compared to men whom most work in towns. Prolonged dry spells and/or droughts affect other sectors relying on alternative water. Sectors using surface water like lakes and dams and subsurface water are usually the last ones affected. The dryness of the environment due to droughts will also substantially increase the risk of forest fires which compromises the safety of both human and wildlife populations especially in the rural areas again where they are less prepared to deal with such disasters.

Emergency relief and drought response:

The Rural District Council (RDC) in some communities in Zimbabwe has through negotiations and partnership with NGOs such as CARE Zimbabwe and the World Food Program engaged the local government to use Grain Marketing Board storage facilities for the grain stocks. The importance of a grain reserve stock in case of moderate to severe drought is very important for drought response preparation. The proposed reserve stock would serve as relief in the case of occurrence of drought. Such a minimum reserve stocks policy would avoid delayed importation, since the responsibility for this exercise and provision of funds will lie in the hands of the RDC through the Local Government. Also the government's initiated District Development Fund also was given the responsibility to erect boreholes in drought prone rural communities. These boreholes have assisted the people and livestock in providing water whenever droughts hit. However, it was noted that if the drought is prolonged, this has a tendency of also drying up the boreholes in these areas.

Furthermore, development partners (NGOs) come in to support government through implementing projects that address drought extreme conditions by providing food aid and water to different affected communities. Livestock are also extremely affected by droughts especially those of long duration. The Vet Field Services Department also works in collaboration with FAO in providing supplementary feeds for livestock in affected areas. However, the government of Zimbabwe has the major role in emergency relief and drought response with the Ministry of Agriculture taking the leading role. Development partners (NGOs) come in only to support government through implementing projects that address the extreme conditions such as these droughts by providing food aid to different communities

Practices to alleviate drought impacts:

Chipindu (2008) confirms that conservation is not only an essential aspect of development, but drought management too. Alternative energy sources such as jelly oil, paraffin and solar were being distributed to households in the community on condition that they were willing to participate in the drought management program. Again, livestock that are ecologically viable and provide tillage such as donkeys and goats were promoted. Moreover, people were encouraged to use organic manure as fertilizer rather than relying of inorganic fertilizers which have negative implication for the productive capacity of the soil. This is complemented by the technocratic approach to disaster management which recommends that disaster management efforts should be proactive based rather than being reactionary. It follows that, if drought management follows this recommendation, it would be easy to cope with through the community's mitigation efforts in their adoption of conservation practices.

The following practices are encouraged especially in severe drought prone areas:

- Conservation agriculture
- Climate Change Adaptation projects (Bee keeping, livestock, etc)
- Promotion of small grain drought tolerant crops
- Promotion of short season varieties
- Water harvesting techniques
- Irrigation

Farmers, especially communal small holder farmers through AGRITEX are advised not only to rely on indigenous knowledge on seasonal forecast but to in-cooperate more the scientific seasonal forecast issued by MSD. Other scientists argue that the indigenous indicators, such as the physiological behavior of trees, behavior of frogs and sounds of birds, are related to the response of certain animals and plants to the already prevailing weather stimuli, rather than the coming season.

The need for knowledge and skills on drought management:

Studies in Zimbabwe are indicating that smallholder farmers are increasingly concerned about unfamiliar climate dynamics, including uncertainty about planting, loss of crops and damage to infrastructure (Zvigadza et al, 2010). The same farmers highlight the lack of access to weather trends and climate data. There is need for the MSD to embark on nationwide awareness campaign to conscientise farmers on how to use weather and climate products and also where to get this information. In the past, drought relief programmes have suffered from four major shortcomings. First, there has been no adequate definition of drought so that drought declaration has been determined by practical experience and observation rather than a scientific process. This has resulted in frequent national drought declarations, and extensive relief programmes, when only part of the country has been affected. Second, the Government has borne the responsibility for risk management and has financed and delivered substantial relief programmes during drought. This has discouraged farmers from adopting risk minimizing farming practices. Third, a number of drought programmes, like the fodder subsidy, have led to unsustainable farming practices. Finally, vulnerable group food distribution programmes during drought have been inefficient, poorly targeted, and of limited impact in ensuring household food security (Chitongo, 2013).

Several Studies have been done in Zimbabwe's communal areas. For example, (1) Coping with drought and Climate Change (Unganai); (2) Building Adaptive Capacity to Cope with Increasing Vulnerability due to Climate Change (ICRISAT) and many others show a lack of capacity and leadership in local government around climate change adaptation. Strong local institutions are a critical success factor for adaptation. Environmental change is dynamic, so new challenges will always be emerging. These challenges require well-resourced institutions. The pressing need is to establish a drought early warning system at national and local level. Furthermore, the country would highly benefit from the following:

- Upgrading and modernizing the hydro-meteorological observation networks, data management and forecasting system as well as supporting sustainable organizational, human and technical resources to maintain and operate them;
- Training in drought vulnerability and risk assessment;
- Enhancing the cooperation and networking between various hydro-agro-meteorological sectors, different stakeholders and end-users of this data, services and early warnings;
- Strengthening the capabilities for drought preparedness and management, including contingency plans at local and national level; and
- Developing sustainable irrigation systems.

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