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Analysis of Livelihoods and Food Consumption Challenges in the Face of Persistent Droughts in Bulilima District of Rural Zimbabwe in Matabeleland South

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Abstract:

The study analysed rural livelihood and food consumption challenges and coping options under adverse impacts of persistent droughts among subsistence farmers in rural Zimbabwe. The results indicated that subsistence farmers are highly affected by persistent droughts and livelihoods and food consumption highly constrained by the phenomenon. However despite the sad reality of lack of deliberate policies, institutions and systems to mitigate the problem of drought in the district, farmers somehow constructed and reconstructed themselves to cope with droughts. The study further revealed that participants were not passive victims of drought, as demonstrated by various alternative livelihoods that they adopted in coping with the phenomenon. Some of the adaptive coping strategies adopted by participants were dietary shifting, reliance on casual labour, dependence on remittances, and to some extent participants utilized their own production. Markets and wild fruits (wild foods gathering) also played a major role. Participants were enterprising and innovative, and employed their indigenous knowledge systems to predict weather patterns in the absence of conventional modern weather predictions. The local communities adopted alternative livelihoods and income sources in order to cope with drought.

Keywords: Adaptation, climate change, coping mechanisms, drought

1. Introduction

Drought has emerged as a major global challenge of the 21st century because of its past, present and persistent livelihoods, environment, and socio-economic impacts. Regions such as Asia, Africa, Middle East, Europe and the United States are prone to droughts in varying proportions (Figure 1). Globally, droughts have resulted in extreme water scarcity and the impact has been felt in mainly three areas, that is socio-economic and on the environment (United Nations Environment (UNEP, 2002). The drought economic impacts cost people and business, for example farmers may lose money if drought destroys their crop and also economy might perform poorly if the major source of industrial power is hydro-electricity since drought leads to water scarcity. Socially, droughts present very precarious situations where people's health, well-being and safety is threatened. For example, water scarcity due to drought might result in water related and other natural resource conflicts, and public health problems related to drought related diseases. Since plants and livestock, including wild life depend on water, when a drought occurs their food supply chain shrinks and their natural habitats diminish and the pasture development is compromised (Levina, 2006). Naturally, loss of wetlands and diminished pasture result in livestock and wild life migration and hence compounding peoples' risks of safety and well-being.

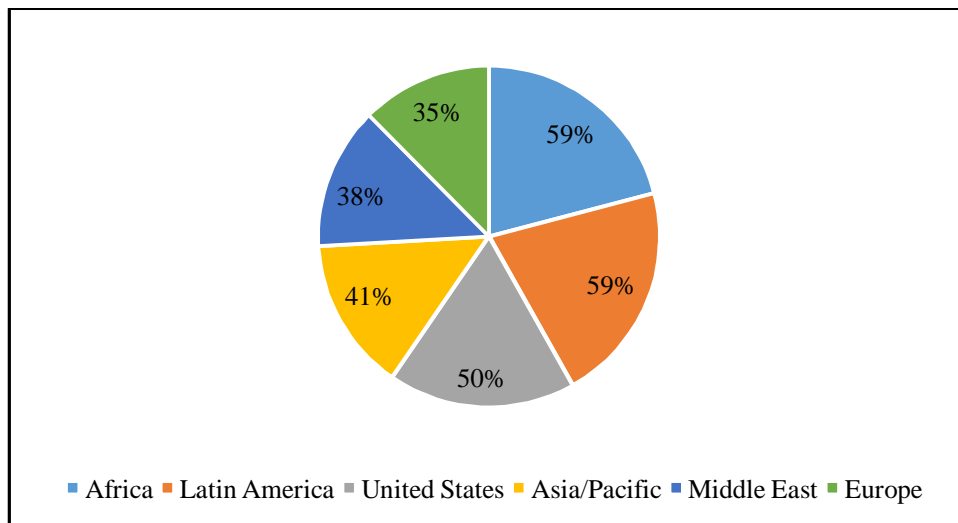


Figure 1: Global drought prevalence

Source: Centre for Research on Epidemiological Disasters (CRED), (2012)

According to CRED, (2012), Africa is more prone to drought compared to other regions, with 59% prevalence rate just like Latin America; and within Africa, Zimbabwe is one of the drought prone countries (Figure 2). The Southern part of Zimbabwe in particular has been and continues to be susceptible to droughts year on year, with increasing intensity in the last 10 years (FAO, 1997). Severe droughts in Zimbabwe have led to loss of livestock, livelihoods and at times loss of peoples’ lives due to starvation and hunger. Specific periods and years of droughts have been recorded in Zimbabwe (Table 1).

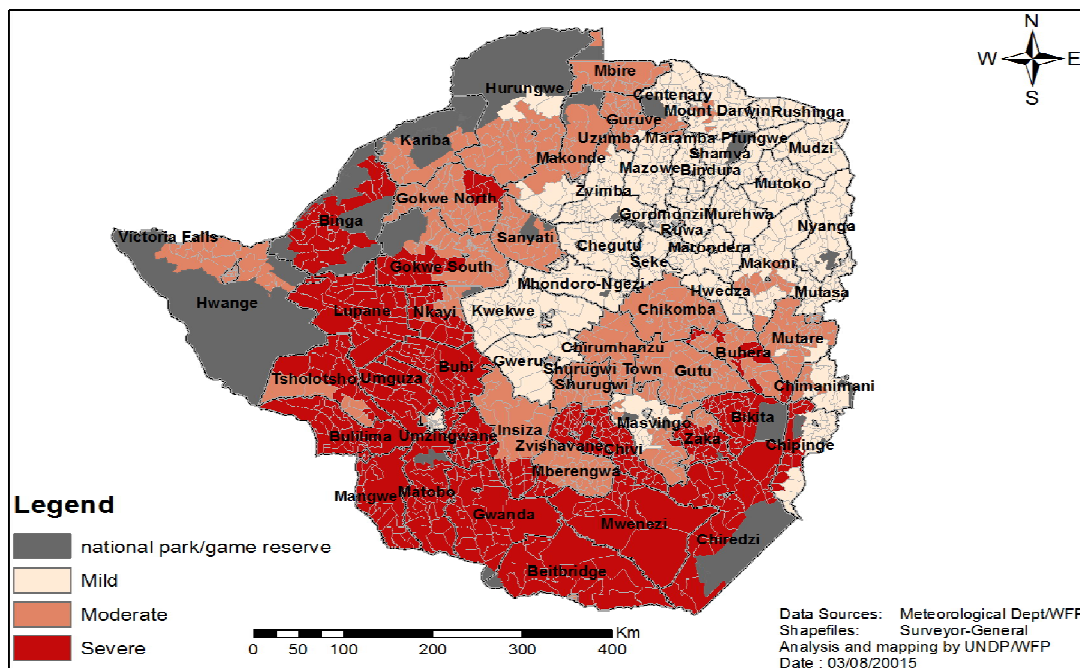


Figure 2: Drought prone areas in Zimbabwe

Source: United Nations Development programme (UNDP), (2009)

Most, if not all rural communities in Zimbabwe depend on subsistence rain-fed agriculture for their livelihoods and food security (United Nations Development Programme (UNDP), 2009). Yet, over the years, persistent drought conditions in arid and semi-arid areas of the country have continued to frustrate agricultural production efforts and climate sensitive livelihoods. According to the Centre for Research on the Epidemiology of Disasters (CRED, (2012), Zimbabwe has not been spared the devastating effects of drought. In the last 10 years, frequency and intensity of drought have increased, exacerbated by the impact of climate change and variability. However, its effects have tended to be disproportionate, with the hardest hit regions being those that are found in agro-ecological regions IV and V (Wilhite, 2000). These regions experience low and erratic rainfall annually, and are largely suitable for livestock and small grains crop production (MSD, 2002). Despite such devastating effects of drought in arid and semi-arid regions of Africa and Zimbabwe, the production of crops and livestock are at the centre of African economies. Such crop and livestock

production practices have rendered the agricultural sector a risk prone enterprise; more so because it is dependent on rainfall. The study area, falls within the Agro-ecological IV and V zones, characterized by minimum rainfall performance and persistent droughts. Natural farming regions IV and V receive rainfall of less than 500mm at any given period.

Region Number	Characteristics
1	1 500mm of rainfall per annum; low temperatures and diversified farming
2	700-1500 rainfall per annum; suitable for intensive farming. Relatively low temperatures
3	500-700mm of rainfall per annum, relatively high temperatures, suitable for semi-intensive farming
4	460-600mm of rainfall per annum, frequent seasonal drought, semi-intensive farming, high temperatures
5	Less than 500mm of rainfall per annum (erratically distributed), extensive farming region, high temperatures

Table 1: Zimbabwe natural farming regions and regional average rainfall

Source: Manyena and Bongo, 2015

The objective of this study and analysis was to attempt to gain some insight into how how subsistence farmers manage to cope with impacts of drought which directly affects livelihoods and food consumption outcomes. The understanding of how farmers cope and manage to live with the risk of drought is fundamental to policy and practice and could inform future drought policies and practices.

2. Conceptual Framework for Rural Livelihoods Analysis

A notable definition of livelihoods is given by Chambers & Conway (1992) as follows:

- 'A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living: a livelihood is sustainable which can cope with and recovers from stress and shocks, maintain or enhance its capabilities and assets, and provides sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term'

The conceptual framework makes central interacting factors of ecology, social and economics as central to determination of stability of a community. In other words, when a drought strikes, and particularly for the community that is dependent on climate sensitive livelihoods and agriculture, peoples' ecological, social and economic landscapes are severely impacted on and this may also influence the adoption of negative drought coping mechanisms. Yet, it has been generally observed that relief aid on its own does little to strengthen ecological, socio-economic factors that are the root for community stability.

According to Musarurwa, (2012), sustainable environmental management and resilient livelihoods profiles are key factors for effective climate change management. Poor communities such as communal or subsistence farmers that normally have limited resources and even lack draft power for subsistence farming and livestock production. The capacities and vulnerabilities of communities need to be understood by both policy makers and programme planners, with the aim of strengthening such capacities and transforming them through institutions and governance structures (Moyo *et al*, 2012). The conceptual framework provides a comprehensive way of understanding how rural communities construct and re-construct themselves to cope with the problem of drought and related climate extremes. In the vulnerability context related to rural livelihoods, members of households pool resources and capabilities in order to cope with drought problem. The context should be understood in season-ability, trends and shocks that contribute and impact negatively on livelihoods (Chambers and Conway, 1992).

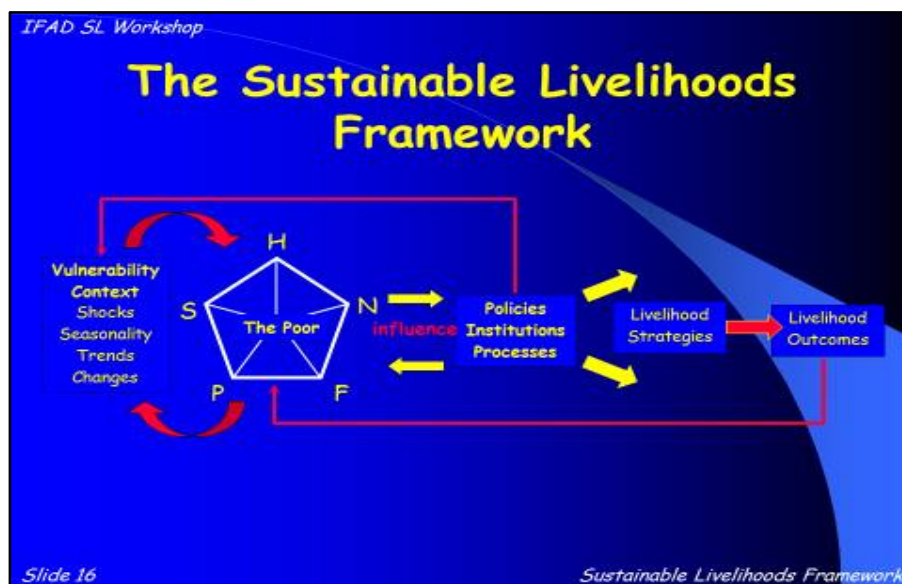


Figure 3: The Sustainable Livelihoods (SL) Framework

Source: Twigg, (2004)

3. Description of the Study Area

The study focused on Bulilima district of rural Zimbabwe. The district hardly produces enough cereal for household consumption, and therefore highly dependent on remittances from outside the country (24%) of the population in the Province rely on remittances. High livestock attrition due to drought related diseases also compound the problem of livelihoods in Matabeleland South. An average of 58% of the population has no livestock at all and about 78% has no access to draft power (Zimbabwe Vulnerability Assessment Committee (ZiMVAC), 2015).

According to meteorological records, Bulilima and Mangwe Districts have been experiencing meteorological droughts every four years, on average (Meteorological Services Department, 2009). According to Kivaria, (2007), meteorological droughts are extreme weather conditions characterized by persistent recurrent droughts (Table 2), which cumulatively result in agricultural drought that leads to crop failure. In a study conducted by Practical Action, (2010), participants in both Mangwe and Bulilima districts of Matabeleland South had varying perspectives on the recurrence and trends of both meteorological and agricultural droughts. Tshuma and Mathuthu, (2014) findings in Mangwe and Bulilima districts established that communities used to experience major droughts on a ten year cycle.

Since the year 2000, droughts of varying severity have been experienced almost every year. The droughts of 1946/47, 1967/68, 1972/73, 1982/83, 1991/92, 2002/03, 2004/05 and 2006/07 are remembered for the severity of their impacts. The recurrence of climatic related hazards in Bulilima, and mainly droughts (Table 1), have resulted in loss of livelihoods, crop failure, diminished pasture, food shortages, water scarcity, livestock attrition and deaths, as well as livestock migration and disruption and destruction of social safety nets and natural habitats.

Year	Disaster
1946/47	drought
1967/1968	drought
1972/1973	drought
1981/1982	drought
1991/1992	drought
1994/1995	drought
2000/2001	Floods (Cyclone Eline)
2001/2002	drought
2002/2003	drought
2004/2005	drought
2006/2007	drought
2008/2009	moderate drought
2010/2011	drought
2011/2012	drought

Table 2: History of drought in Bulilima district

Source: Survey 2013

Meteorological data indicate that the frequency of droughts has indeed increased, since 2000 (MSD, 2008). On the other hand, there were some years communities pointed out as drought years that were not recorded in meteorological data. This is because communities understand drought in a number of ways, including shortage of grazing and food. To them it is not only a matter of the amount of rainfall but also the impacts that define a "drought" (Practical Action, 2010). The annual average rainfall is 350mm – 650mm starting from November to March/April (Meteorological Services Department, 2002). The rainfall pattern is very erratic with regular and persistent droughts. It is a semi-extensive to extensive livestock ranching area supported by the production of drought tolerant crops with an emphasis on production of small grains, despite the fact that maize is the staple crop. There is also an abundance of wildlife in the former large-scale commercial farming area which is a threat and risk to both crops, veld and to food security.

According to Agricultural Extension Services (AGRITEX) (2013), about 75 % of the southern part of the district has sandy soils prone to leaching and low water table. The area is suitable for small grains although the communities have continued to grow maize crop. On average the district has an average annual rainfall of 450mm (Bongo and Manyena, 2009). The quantity of rainfall that falls per year decreases from the North to the South of the district (Department of Meteorology, 2013). The 450mm average rainfall received in Bulilima district per year makes the district prone to recurrent meteorological and agricultural droughts, with an average decline yield of 0.48 tonnes per hectare in 2015 (ZiMVAC, 2015).

4. Design and Methodology of the Study

This study adopted a qualitative case study method embedded in interpretivist paradigm. A case study has been used by a number of researchers in areas of social sciences, psychology, anthropology and ecology; especially used in trying to test theoretical models in real world situations. According to Stake, (1995), a case study method provides for in-depth exploration of an event, process or one or more individuals. When a case study method is used appropriately, it allows generation of a variety of detailed information over a sustained period of time; after which when analysed a phenomenon is understood by inquirer. According to Guba and Lincoln, (2000), case study method allows and facilitates exploration of phenomenon within its natural context using a variety of data sources; ensuring

that the issue at hand is not explored through one lens, but rather a variety of lenses which allows for multiple facets of phenomenon to be revealed and understood.

The Case study method provides for in-depth study of a phenomenon and situation rather than a sweeping statistical survey (Neumann, 2000). It is a method suitable for narrowing down a very broad field of research into one researchable topic, yet suitable for isolating and studying a small group of people, community or countries.

This study adopted a case study method because it provides for rich, thick description of the cases with data drawn through triangulation techniques from various sources (Chisaka, 2007). The case study method has three important characteristics: the nature of experience as a phenomenon to be investigated, the knowledge to be achieved and the generalizability of studies from the method (Stake, 1995). The depth of the experience of the participants which is found in the method is precisely the most interesting aspect of its nature (Denzin and Lincoln, 2000).

Data was generated by utilizing researcher as main instrument, and through techniques of Focus Group discussions with key informants and household interviews with subsistence farmers' heads of households. The data was analysed continuously in the field by forming themes and patterns and also through the use of NViVO. The data was presented in tabular, graphics and narrative forms. Some voices of the study participants were transcribed verbatim to 'hear real voices'.

5. Results and Discussions

Subsistence farmers have relied on various and alternative livelihoods and capacities, traditional knowledge and skills in order to subvert adverse effects of drought. The question of how subsistence farmers managed to sustain themselves faced with recurrent drought is what partly pushed me to conduct this study. Coping mechanisms such as reliance on small grains for cereal production, access to some irrigation schemes in the district, and livelihoods based coping were reported by participants. In crop production (Figure 4.9), shows that despite recurrent droughts and erratic rainfall in the district, subsistence farmers continue to plant maize in their fields; they also however plant some other small grains like sorghum and millet and the hectares under these crops (small grains) has been increasing steadily, especially that of millet which is drought resistant. More and more subsistence farmers indicated that they preferred either sorghum or millet seeds for the following planting season.

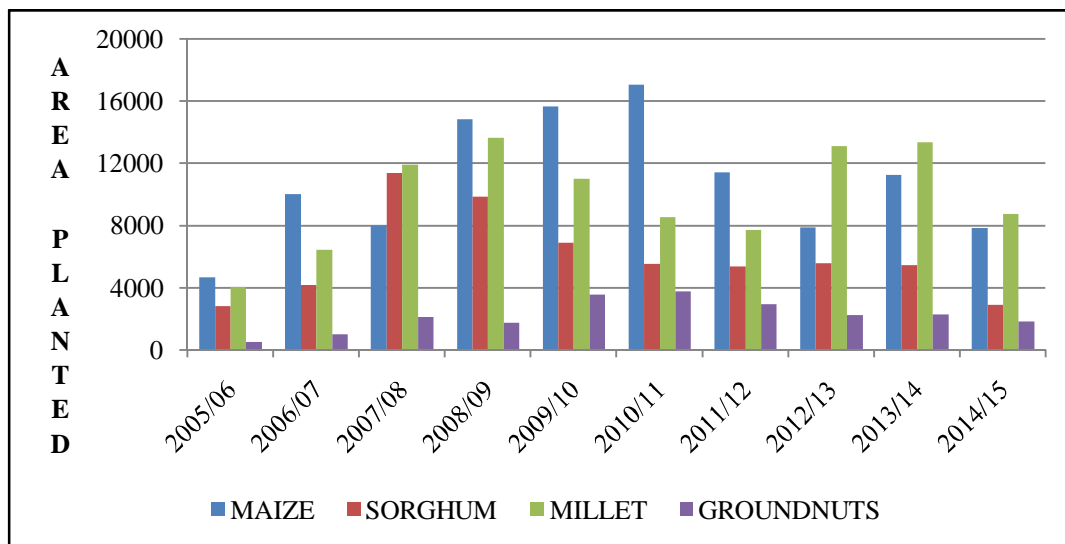


Figure 4: Crop types grown and area planted

The cereal yield levels year in year out have been below 0.5MT per year, yet the potential in the district is on average, 1MT per hectare, according to the District AGRITEX Officer. Maize hectare from 2005/2006 has been more and to 2010/11 planting season; 2011/2012, it started decreasing up to the lowest in 2015/2016. This is attributed to the climate variability and unavailability of crop inputs. For small grains, there has been a fluctuation on the area planted from 2005/06 to 2015/2016 season. This is attributed to sometimes unavailability of small grain seed. Overall, from 05/06 to 15/16 season, the production levels were very low so much that year in, year out, there was cereal deficit in the district, the magnitude which varied from season to season.

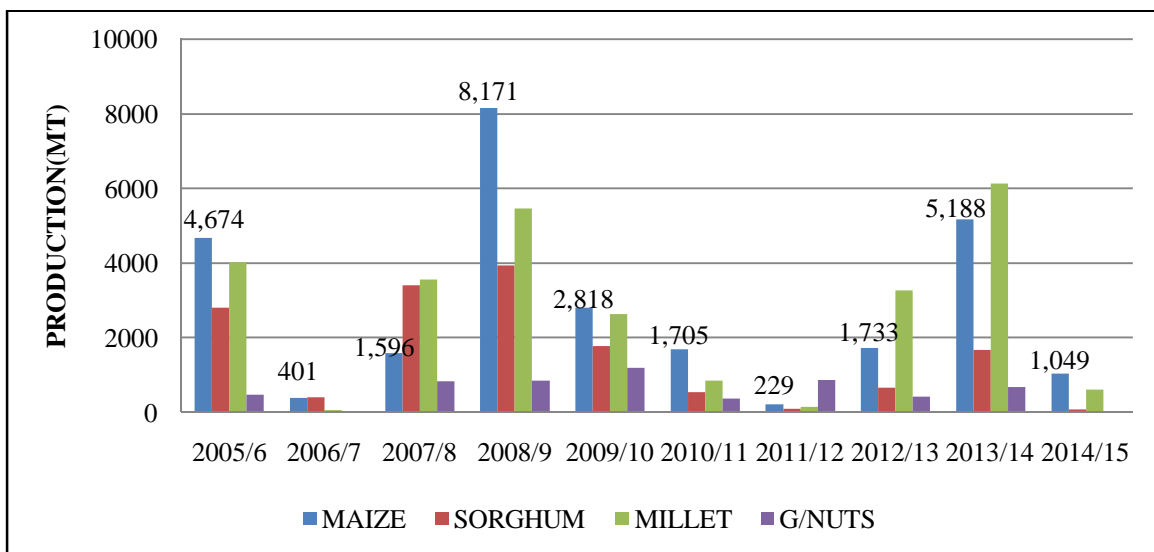


Figure 5: Cereal production levels for past 10 years

According to the District Agriculture Officer's report (2015), crop production trends have been diminishing over the years for all the main crop types. Maize yields had reduced and continued to reduce drastically from as high as 8 171 MT in 2008 to 1 049MT in 2014/2015, while sorghum and pearl millet had moderately low over the 10-year period. The reduction in yield over the years and counting, was better explained in terms of the amount of rainfall that fell in each of the planting season, the less rain there was, the less yield, especially maize yield. For example, the year 2008/2009 had moderate drought and maize yields were relatively good compared to other severe drought years. In other words, 2008/2009 season was labelled as a normal year for the subsistence farmers in the district.

Apart from relying on small grains for cereal production, the District AGRITEX Officer informed the research team that; *"Abantu lapha abaphili ngokulima, kodwa ngeNjiva"*. Literally translated that people here do not rely solely on cereal production, but remittances from those family members who live in the diaspora.

The study revealed that remittances ranked highest on household income sources; and it is the youth of communities are normally working outside the country. This age group mostly worked in the 'diaspora' in South Africa or Botswana and in turn supported families back in Zimbabwe. The support came in the form of actual groceries or cash to households. The support was said to be erratic and therefore difficult to quantify in monetary terms as household monthly income. According to household interviews and from most of interviews, remittances had been on a decline in the last decade. A widow (Ma Khumalo, 2015) stated that;

'abantwabethu labo bayazihluphekela khonale e Goli laku bo Botswana, abaselanto abasithumezela yona kulezi insuku'; literally translated to mean that; 'our children are equally suffering out there in South Africa and Botswana, they are no longer sending us anything these days'.

A participant in Hingwe stated that;

'thina sisila ngokuchapha siye e Botswana ukuyawatshela ama Tswana kumbe ukuba gudulela izindlu ukuze sithole okokudla' literally translated to mean that, we are only able to survive by going across to Botswana to take up casual part time work of washing clothes and other household chores.

Other income sources included sale of livestock, mainly goats, engaging in crafts and basketry as well as limited fulltime employment within Zimbabwe.

The variable of income sources was crucial for measurement of household economy and community resilience to impact of drought and also in understanding how the five capitals in the Sustainable Livelihood Framework (SLF) are impacted by socio-economic characterisation of the community. These also assisted in sign posting some of the capacities and strengths that are endowed within the community. The research further revealed that the respondents had their ways of bouncing out of transient poverty in the face of drought through various means. Livestock acted as a bank where they stored their monies and liquidated in times of difficulties.

Subsistence farmers also relied on livelihood coping strategies when faced with the problem of drought. Some of the strategies were short and others medium to long term (Table 3)

Household results revealed that households in Bulimia district adopted a number of coping strategies in order to cope with the increasingly persistent droughts. Participants were asked to rank the coping strategies according to their effectiveness and importance in coping with drought. Table 4.9 shows major strategies adopted by households in drought years; and most households have adopted cutting down on meals, and heavily rely on remittances from those that have migrated to the 'diaspora' in search of jobs and other livelihood options. The first four ranked strategies were said to be very important and key techniques for coping with recurrent drought. One participant in Gwambe (a Carpenter), said;

'mina izindlu lezi elizibonayo ngasebenza kudala ngazakha, okwamanje ngingulova ngiphila ngobaza izitulo ngithengise e Plumtree' literally translated to mean that, the houses you see (modern houses in the village), I constructed them when I was still working in

South Africa, now I am retired and I rely on selling chairs that I make. I sell the chairs in Plumtree town. The Carpenter's wife does basketry, and she said;

'mina umamazala wangifundisa ukuthunga ingcebethu, yikho esiphila ngakho lapha ekhaya. Ngiyazithengisa ngemali kumbe ngithi umuntu kathele amabele phakathi kube yiyo imbadalo' literally translated to mean that, as for me my mother in law taught me how to make basketry and this is what makes us survive in this home. At times I sell basketry for cash or barter and we survive. Apart from crop production, subsistence farmers continued to employ other means of living with the risk of drought, including negative coping strategies like reducing meals per day or skipping meals, sale of crafts and also relying on remittances, mainly from outside the country. Remittance flow was however reported reduced over the past 5 years, and the reasons given were that those family members living in the diaspora were no longer employed. Reduced remittance flows were directly linked to the global economic crisis and the xenophobic attacks that were being carried out in both South Africa and Botswana.

Coping mechanism/strategy	Rank
Reduced meals (eating once a day)	1
Migration to diaspora (to South Africa or Botswana) in search of jobs and provide remittances	2
Plant drought tolerant crops (small seed varieties for example pearl millet and sorghum)	3
Sale of crafts and traditional wares (basketry)	4
Casual labour (brick moulding, thatching, sweeping yards, weeding)	5
Begging from neighbours	6

Table 3: Ranking of households drought coping mechanisms

Scale: 1-5 (1 most frequently utilized and more important and 5 being least frequently used and less important)

The majority of participants indicated that they are only way of coping was through reduction or skipping of meals; as one participant in Natane stated;

'thina lapha ekhaya sidla kanye kuphela, njalo yiyo impilo yethu', literally translated to mean, here we eat only once a day and that is the life we know.

In Ndiweni Village, Chief Ndiweni exclaimed;

'abantu bonke lapha baphila ngenxa ye Goli le Botswana, kuyiskho lokho, ngabe akuselabantu lapha', literally translated that all the people here are alive because of remittances from diasporans in South Africa and Botswana, otherwise they will all be dead of hunger. When people faced a problem of food insecurity they adopted consumption and livelihoods based coping mechanisms.

6. Conclusions

From the findings of the study, it is apparent that drought has a devastating impact on subsistence farmers' livelihoods and food consumption. Yet, it is also apparent that phenomena such as drought go beyond capabilities and mandates of individual households affected as they could be mitigated and managed through policies, institutions and processes. It can also be concluded that communities are or were not helpless victims in all the years they continued to live with the risk. In constructing and reconstructing themselves to cope with the problem of drought, households depleted assets, changed livelihoods and consumption patterns.

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