DROUGHT COPYING STRATEGIES AT MUTASA DISTRICT IN ZIMBABWE

By

NDLOVU BRAIN

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Study Leader: ANDRIES J. JORDAAN

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DECLARATION

By submitting my thesis, I confirm that the work submitted for assessment for this work is my own unaided work except where I have explicitly indicated otherwise. I have followed the required convention in referencing the thoughts and ideas of others and I have not previously or in its entirety or in part submitted it for obtaining any qualification.

..... **.....**

BRAIN NDLOVU **DATE**

DEDICATION

To my late brother, Clifford Ndlovu. He encouraged me to do these studies, but never lived to see my work.

ABSTRACT

Recurring droughts are an endemic feature for agriculture in Zimbabwe, a country whose majority of the population (70%) depends on agricultural based activities as their livelihoods resource. Concern is growing that drought might become more frequent in the region as a result of global warming. If this occurs it will exacerbate problems for vulnerable households, communities and economies. The study reviews coping strategies of the community towards drought, and assesses the capacity of local institutions in dealing with drought. The objectives of the study was to identify and examine coping mechanisms in place by individual households and the community, to identify local institutions involved in drought mitigation, to assess how local institutions have responded to disaster risk reduction and appraise the capacity of local institutions involved in risk reduction. Participatory, consultative and deductive research methods including household surveys, focused group discussions, key informants interviews, observations and review of literature allowed for the collection of empirical, descriptive, and spatial data to provide for the appraisal.

The study revealed that households in the district have developed sophisticated (ex ante) risk-management and (ex post) risk-coping strategies to cope with food shortages or drought. In the initial phases of difficulty, tendency to reduce meal portions, go the whole day without food, sale of labour and use of available resources such as savings, were the most common. As the situation intensified, recourse was sought in broader social and economic interactions such as sending some members of the family to other relatives, cross border trading, sale of small stock; barter exchange and even begging were established. Finally, sale of productive assets such as large stock, implements and non productive, but difficult to replace assets, such as valuable roofing material in the form of asbestos sheets occur. The study established that various institutions were involved in drought management in the district. They included government departments, CBOs/NGOs/INGOs, local leadership and the community, social networks that include friends and relatives and some religious arganisations. However, not much support had been coming from government institutions as compared to NGOs. Challenges common to both NGOs and Government departments included political interference in day-to-day activities that sometimes derailed implementation of drought risk reduction activities. The existing economic environment had also led to high staff turn-over in most government departments and shortages of inputs and materials required for drought risk reduction. The current global economic crisis exacerbated the situation affecting funding inflows for some NGOs. Recommendations were proposed and key among them were to design sustainable interventions for a drought prone area and a local and participatory agro ecosystem appraisal is necessary. The most effective interventions will prove to be those that enhance household coping strategies. A user friendly

satellite remote sensing must be designed and vulnerability maps in the early warning systems. To establish civil protection committees at grassroots level is of paramount importance.

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- I wish to express my sincere gratitude to my study leader Andries J. Jordaan, who guided me throughout the study period. The gratitude is also extended to staff members in the department such as Olivia, Alice and Anneline who were always there for advice, even at short notice.
- Dr Chikobvu who was instrumental in the design of my questionnaire for quantitative data, thank you.
- The study would not have been successful without the support of Mr Cephas Nyambo the then acting District Agricultural Extension Officer for Mutasa District, for his unfailing support in gathering the research data.
- Honestly, the acknowledgement will be incomplete without featuring my wife Ireen and daughters Luana and Lethabo who endured long hours without their father who was trying to compile this work into a readable piece.

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ABBREVIATIONS AND ACRONYMS

AGRITEX	Agricultural Technical & Extension Services
AIDS	Acquired Immune Deficiency Syndrome
BRIMP	Botswana Rangeland Inventory and Monitoring Project
CBO	Community Based Organisation
CSO	Central Statistical Office
DA	District Administrator
DAT	Drought Assessment Tour
DCPPC	District Civil Protection and Planning Committee
DDF	District Development Fund
DDRC	District Drought Relief Committee
DMS	Department of Meteorological Services
DSS	Department of Social Services
DVS	Department of Veterinary Services
EWS	Early Warning System
EWTC	Early Warning Technical Committee
EWU	Early Warning Unit
FAO	Food and Agriculture Organisation
FDG	Focused Group Discussion
FEWS	Famine Early Warning System
FEWSNET	Famine early Warning System Network
GMB	Grain Marketing Board
GoZ	Government of Zimbabwe
GTZ	Germany Technical assistance to Zimbabwe
HIV	Human Immune Virus
ICRISAT	International Crop Research Institute for the Semi Arid Tropics
IMDC	Inter Ministerial Drought Committee
INGO	International Non Governmental Organisation
KI	Key Informant
KII	Key Informant Interview

LPD	Livestock Production Department
MLGLH	Minisrty of Local Government, Lands and Housing
MLGPW & UD	Ministry of Local Government Public works & Urban Development
NCPCC	National Civil Protection Coordinating Committee
NDMC	National Drought Mitigation Center
NGO	Non Governmental Organisation
PA	Provincial Administrator
RDC	Rural District Council
REWU	Regional Early Warning Unit
SADC	Southern Africa Development Committee
SPSS	Statistical Package for Social scientists
UNAIDS	United Nations Programme on AIDS
UNISDR	United Nations International Strategy for Disaster Reduction
UNSO	United Nations Sudano-Sahelian Office
VGF	Vulnerable Group Feeding
VS&L	Village Saving & Lending
WFP	World Food Program
ZCFU	Zimbabwe Commercial Farmers Union
ZFU	Zimbabwe Farmers Union
ZimVAC	Zimbabwe Vulnerability Assessment Committee

CHAPTER 1: INTRODUCTION

1.1 Introduction

In this chapter the definition, overview and impact of drought in Zimbabwe and Southern Africa is outlined. The problem statement is formulated and objectives of the study are stated. The justification of the work is discussed while the hypothesis, delimitation and limitations are outlined. The outline of this thesis is then addressed at the end of the chapter.

1.2 Background

Southern Africa has a highly variable climate with recurring droughts, an endemic feature of agriculture (Du Pisani, Fouche & Venter, 1998). About 70% of Zimbabwe's population derives its livelihood from subsistence agriculture and other rural activities, but these livelihoods are threatened by climate change. The agricultural sector's reliance on seasonal, rain-fed cultivation makes the sector particularly vulnerable to climate variability and change (Andear, 2009).The country is prone to drought which has become more frequent in the past decade (Andear, 2009). Drought is considered by many to be the most complex, but least understood of all natural hazards, affecting more people than any other hazard in socio-economic terms (Wilhite, Hays, Knutson & Smith, 2000) as seen in Table 1.1.

TABLE 1.1: HAZARD TYPES AND THEIR CONTRIBUTIONS TO DEATH, 1900 – 1999

Hazard type in rank order	Percentage of deaths
Slow onset:	
Drought/famines	86.9
Rapid onset:	
Floods	9.2
Earthquake and tsunami	2.2
Storms	1.5
Volcanic eruptions	0.1
Landslides	<0.1
Avalanches	Negligible
Wildfire	Negligible

Source: adapted from Wisner et al., 2004

For example the 1991/1992 drought in Southern Africa affected almost 20 million people and resulted in a deficit of cereal supplies of more than 6.7 million tonnes (Wilhite *et al*., 2000). Drought differs from other natural hazards in several ways. Firstly, the effects of droughts often accumulate slowly over a long period of time and may linger for years after the drought. Secondly, the onset and end of drought are difficult to determine and because of this,

drought is often referred to as a creeping hazard (Wilhite *et al.*, 2000; Wisner *et al.,* 2004). Thirdly, despite its devastating impact, there is no precise and universally accepted definition of droughts and this adds to the confusion about whether drought exists, and if it does, its extent and degree of severity. Fourthly, drought has no structural and physical impact, which to some extent has hindered the development of accurate, effective, reliable and timely estimates of its severity and ultimately, the formulation of drought contingency plans by many governments in Africa (Wilhite *et al.*, 2000; Holloway, 2003).

Drought is a normal, recurring feature of the climate and occurs virtually in all climatic regimes in high as well as low rainfall areas (International Strategy for Disaster Reduction (ISDR), 2002). It is a temporary aberration, in contrast to aridity, which is a permanent feature of the climate restricted to low rainfall areas (Wilhite, Hays & Knutson, 2005). In Zimbabwe, the incidence of drought is often linked to the occurrence of El Nino episodes and has worsened since the 1980s (ISDR, 2002). Floods that frequently occur in the northern and southern provinces of the country, compound drought conditions in other parts of the country (ISDR, 2002). Drought is a consequence of a natural reduction in the amount of precipitation received over an extended period of time, usually a season or more and is also related to timing and effectiveness of the rains such as delays in the beginning of the rainy season, occurrence of rains in relation to crop growth stages, rainfall intensity and number of rainfall events (Wilhite *et al.*, 2000; Wilhite, Hays & Knutson, 2005).

There are four perspectives on drought: meteorological, agricultural, hydrological and socio-economic. Meteorological drought is usually defined by the measure of the departure of precipitation from the normal and the duration of the dry period. Agricultural definitions refer to situations in which the moisture in the soil is no longer sufficient to meet the needs of the crops growing in the area. Hydrological drought deals with surface and subsurface water supplies (such as stream flow, reservoir/lake levels, ground water). Socio-economic drought refers to the situation that occurs when economic goods associated with the elements of meteorological, agricultural and hydrological drought fail to meet the demand (Bang & Sitango, 2003).

Drought severity is dependent not only on the duration, intensity and geographical extent of a specific episode, but also on the demands made by human activities and vegetation on an areaôs water supplies. The characteristics of drought, along with its far-reaching impacts, make its effects on society and environment difficult, though not impossible, to identify and quantify (Wilhite *et al.*, 2000; Bang & Sitango, 2003; Wilhite, Hays & Knutson, 2005).

While drought is widely considered a natural and physical event, it has some social component. The risk associated with drought for any region is a product of both the exposure to the event and the vulnerability of the society to the event (Wisner *et al.,* 2004; Wilhite, Hays & Knutson, 2005). Exposure to drought varies spatially and there is little, if anything, that can be done to alter the probability of its occurrence yet vulnerability on the other hand, is determined by social factors such as population size, demographic characteristics, policy, technology, social behaviour and coping strategies (Wilhite *et al.,* 2000). Thus vulnerability to drought is likely to change, either increase or decrease in response to changes in these social factors. It is therefore logical to assume that subsequent droughts in Mutasa district will have different effects, even if they are identical in intensity, duration and spatial characteristics, because societal characteristics will have changed. However, much can be done to reduce the societal vulnerability component to drought.

There is a wide range of institutional capacity to respond to drought emergencies in Southern Africa. While some countries have a detailed organizational structure in place to coordinate the actions of government, donors and non-governmental organizations (NGOs), most have not developed a permanent institutional capacity (Wilhite, 2000). For example, in Zimbabwe drought emergencies at district level such as Mutasa are coordinated by the District Drought Relief Committee (DDRC), a committee comprised of district level stakeholders such as the District Administratorôs office (DA), Agricultural extension services (Agritex), Livestock Production department (LPD), Veterinary Services department (DVS), department of Social Services (DSS), the Grain Marketing Board (GMB), the Rural District Council (RDC), NGOs and other relevant stakeholders that may be co-opted in the committee.

Common problems with drought and other natural hazards is maintaining interest in planning beyond the relatively short window of opportunity that follows the event, given the on-again, off-again nature of this phenomenon. Interest in drought planning quickly wanes in the post drought period when precipitation conditions have returned to normal or above normal level (Wilhite, 2000). In addition, drought relief committees are well established and domiciled at district level without well functional corresponding structures at village level where the drought victims and first responders to drought emergencies are found.Concern is growing that drought might become more frequent in the region as a result of global warming (ISDR, 2002). If this occurs it will exacerbate problems for vulnerable households, communities and economies including Mutasa, hence, preparing for and mitigating drought occurring today are not only essential activities but could help reduce adverse impacts of future change.

As vulnerability to drought has increased globally, greater attention should be directed at reducing risks associated with its occurrence. This could be through the introduction of planning to improve operational capabilities such as climate and water supply monitoring and institutional capacity than just relief activities. This change in emphasis is long overdue (Wilhite, 2000), in fact, mitigating the effects of drought requires the application of all components of the disaster management cycle rather than the crisis management portion of the cycle. Because of past emphasis on crisis management such as food aid coming in as relief, the community of Mutasa has moved from one disaster to another with little, if any, reduction in risk (FAO, 2010). Many institutions directly involved in drought management mostly concentrate on the response side of the disaster management cycle than risk reduction in drought mitigation. Such an approach has failed to build capacity of households to deal with drought on their own. In addition, drought response has been very expensive and non sustainable.

1.3 Problem Statement

For the past decade, Mutasa district has suffered from at least seven successive agricultural droughts. The rainfall pattern has been so erratic and mostly characterized by dry spells such that rain fed agriculture has become unreliable. Poor rainfall has resulted in rural households failing to harvest any meaningful produce and even those who harvest some grain; it has not been enough to see them throughout the season resulting in food insecurity and stress (ZimVAC[1], 2009). The situation has further reduced the rural householdsô capacity to fend for their children and extended families which in turn limits the householdsô ability to engage in other income generating activities, invest or respond to emergencies. Most farmers depending on rain fed agriculture have experienced a yield decline, with average yield declining from the expected 4 t/ha to 0.1t/ha. The decline has been exacerbated by shortage of inputs such as fertilizer, appropriate seed varieties, inadequate extension services and timing of planting. In addition, the devastating effects of HIV/AIDS estimated at 15.5% and the continuous rural - urban migration or border jumping to neighbouring countries such as Mozambique and South Africa in search of opportunities among the most productive age group, pose a challenge to food production.

The majority of communal farmers have also lost draught power and the high cost of inputs and unavailability of inputs have further compounded the challenges rural households face to acquire the necessary inputs they need to realise better yields (Agricultural Technical &

[1]ZimVAC is a Zimbabwe Vulnerability Assessment Committee that does yearly crop and livestock assessment in the country and feeds the information to government and other stakeholders as an early warning system.

Extension, 2008). Most farmers lack the requisite knowledge and skills to manage their farming activities as commercial enterprises. The situation is exacerbated by the high extension worker farmer ratio which stands at 1:600. Most of the extension personnel have left the department due to poor remuneration, and those still hanging on are demotivated and lack basic support to carry out their duties such as relevant equipment and transport (WFP-Plan, 2009).

Because of the recurring drought over the years compounded by other limiting factors of production, most households have become food insecure and most vulnerable cases are found among women, elderly persons and child headed and/or with chronically ill person (WFP-Plan, 2009). These households have depended on food aid from World Food Program (WFP). In 2008/9 farming season WFP through Plan International[2] provided food aid to an average of 125,000 beneficiaries per month (WFP-Plan, 2009) so as to avert hunger and starvation among the most vulnerable group in a district with an estimated population of 250,000 people (CSO, 2002).Thus, to make a living in semiī arid environments, farmers have to respond to a huge range of spatial and temporal variability. Variability includes diverse landscapes, from hillsides to river-banks, a range of soil types and different rainfall conditions, including drought. The ability to respond to variability[3] varies between farmers. Those with access to external sources of income, like remittances, may be less reliant on agricultural production than others (Dercon, 2002). Those who own or have preferential access to draft power or other inputs like labour or fertiliser are able to farm more flexibly. Those who are constrained to take up other income opportunities due to entry barriers, mostly depend on local institutions for support (Mombeshora ***et. al.,*** 1995).

Official perceptions of *'drought victims'* usually underestimate their resources and resources fullness. Perhaps this is due to the fact that indicators of vulnerability based on the measurement of resources are more easily recognizable by outside institutions. However, people in adverse conditions develop strategies to cope; strategies which remain unnoticed and understudied. Without a proper understanding of the coping strategies, policy makers are most likely to make stereotyped responses in both the preventive measures of vulnerability reduction and relief work. Misdirected relief efforts may undermine rather than assist the affected communities in their attempts to help themselves towards recovery (Holoway, 2003; DFID, 2006).

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[2] Plan International- an international Non- Governmental Organization cooperating with WFP in food aid distribution in Mutasa district

[3] Variability- Is the extent to which data points in a data set diverge from the average or mean value

1.4 Research objective

The purpose of the project was to review the coping strategies of the Mutasa community towards drought, and assess the capacity of local institutions in dealing with drought.

1.4.1 Sub objectives

- To identify and assess coping mechanisms in place by individual households and the community.
- To identify local institutions involved in drought mitigation.
- To assess how local institutions have responded to disaster risk reduction.
- To review the capacity of local institutions involved in risk reduction.

1.5 Justification of the study

Despite the communityôs exposure and experience with drought that has become a common phenomenon in the district, by and large, many households have remained vulnerable to subsequent droughts. A lot of work on crop and livestock assessments has been extensively covered by ZimVAC from 2002-2009 (ZimVAC, 2009), FEWSNET[4] (2008) and FAO[5] (2010). These have been partly government and produced controversial results. In addition, vulnerability, coping strategies of the community and capacity of institutions involved in drought mitigation have only been mentioned in passing. The scope of this work is different from these studies as it attempts to focus in detail on the coping strategies employed by households/communities as well as capacity and challenges facing local institutions to strengthen the ability of communities, households and individuals to be more resilient to drought.

Once the study is done, it can be used repeatedly over a number of years until significant changes in the underlying economy render them invalid. It suggests that outside agencies must understand the coping strategies, otherwise external humanitarian interventions will undermine them, creating aid dependency and all manner of unintended and detrimental outcomes. Rural economies in developing countries tend not to change all that rapidly, however, and a good household/community baseline will generally be valid for three to ten years (Holzmann & Bouddreau, 2008). What varies is the prevailing level of food security, but this is a function of variations in hazard, not variations in the baseline. Put another way, the

[4] FEWSNET ï a Famine Early Warning System Network
[5] FAO- the United Nations Food and Agricultural Organization

level of maize production may vary from year to year (hazard), but the underlying pattern of agricultural production does not (the baseline) (Holzmann & Bouddreau, 2008).

1.6 Hypothesis

Owing to prevalence of drought in rural Mutasa, the community has developed coping strategies, and there are institutions that assist the community to mitigate drought impact.

1.7 Delimitations of the study

The research only focused on Mutasa district and only zeroed in on coping strategies applied from year 2000 up to 2011 and institutional capacity during the same period.

1.8 Limitations of the study

The study results may not be applicable outside the district of Mutasa since coping strategies may be area specific. In addition, due to time and financial resources, only a small sample of the population was interviewed. Equally, the results gathered as coping strategies and capacity of the institutions may change from time to time since these are dynamic variables. The researcher also worked for Plan International, an INGO that distributed food aid in the area thus there was the risk that respondents may had exaggerated the situation on ground linking the research to other baseline surveys done by Plan International yearly, prior to food aid distribution in the district. The most vulnerable in the community had normally been given priority regarding relief.

1.9 Thesis outline

This thesis is divided into seven chapters. Chapter 1 outlines the problem statement, formulated study objectives and gives definitions and impact of drought. Chapter 2 mainly gives an oversight of the study area in terms of location and climatic conditions. It further details the methodology used to gather and analyze data to meet the study objectives. Chapter 3 forms the bulk of literate on drought coping mechanisms, drought management by Southern African countries, drought plans and challenges of drought management in SADC countries. Chapter 4 is dedicated to the legal framework guiding disaster management in Zimbabwe, and also reviews literature on drought coping strategies commonly employed by households and communities in dealing with drought. Results of the study are detailed in Chapter 5 and presented in the form of graphs, tables and other charts. Discussion of the results constitutes Chapter 6 while conclusion and recommendations for areas that need further research are drawn in Chapter 7.

1.10 Conclusion

Drought is considered by many to be the most complex, but least understood of all natural hazards, affecting more people than any other hazard. It is a normal recurring feature of

climate and occurs in virtually all climatic regions. Drought is the consequence of a natural reduction in the amount of precipitation received over an extended period of time, but other climatic factors such as high temperature and wind can significantly aggravate the severity of the event. It has adverse social, economic and environmental impact that can lead to overall reduction in GDP, food security and water sources.

Indeed, drought is a problem as revealed by the study. However, as per the study hypothesis which has been proven correct by the research, the community has developed coping strategies, and there are institutions that assist the community to mitigate drought impact though with challenges.

The next chapter describes the study area and methodology.

CHAPTER 2: STUDY AREA AND RESEARCH METHODOLOGY

2.1. Introduction

This chapter begins with the description of the study area, that is, location, climate, soil types and an overview of the district where the study was conducted is outlined. The last section of this chapter unpacks the methodologies employed for both qualitative and quantitative data and the statistical analyses used.

2.2. Study area

2.2.1. Location

Zimbabwe is a landlocked country in Southern Africa lying well within the tropics. It straddles an extensive high inland plateau that drops northwards to the Zambezi valley where the border with Zambia is and similarly drops southwards to the Limpopo valley and the border with South Africa. The country has borders with Botswana 813 km, Mozambique 1,231 km, South Africa 225 km, Zambia 797 km and meets Namibia at its westernmost point. It is a country with an area of 390,580 km², of which 3,910 km² comprises lakes and reservoirs (Wikipedia, 2011). It is situated between 15 and 22° south latitude and 26 and 34° east longitude (FAO, 2000). It is a member of the economic organization of 14 southern African countries called the SADC. The country has varied biophysical characteristics and divided into five agro-ecological regions.

Figure 2.1: Location map of Zimbabwe within Southern Africa

Source: Adapted from FAO, 2000

There are three relief regions based on altitude in the country. These are the highveld, middleveld and the lowveld regions. The highveld at an altitude of 1200 to 1700m covers 25% of the country and consists of the northern part of the country.

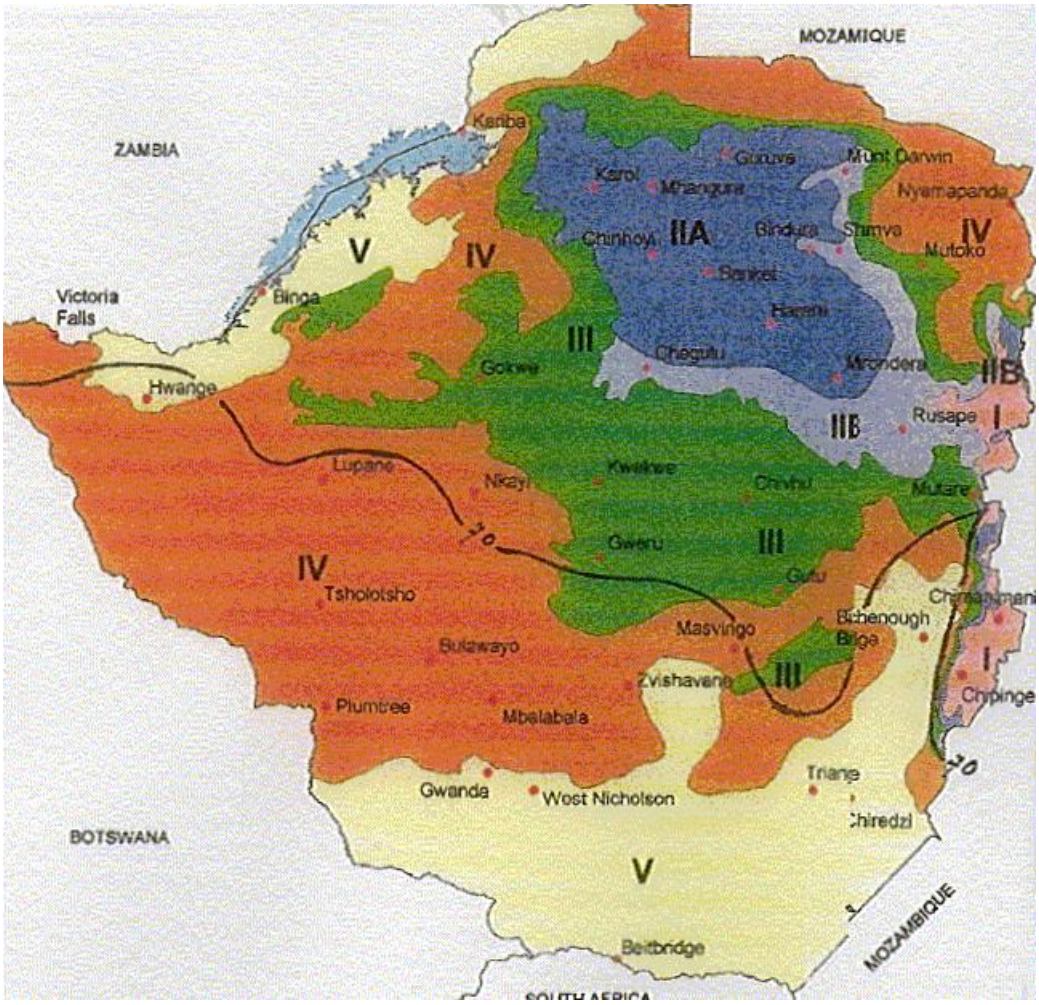

Figure 2.2: The five natural regions of Zimbabwe

Source: FAO, 2000

Legend	
Natural regions	
I	Specialized and Diversified Farming Region
IIA	Intensive Farming Region
IIB	Intensive Farming Region
III	Semi-Intensive Farming Region
V	Extensive Farming Region
The area above the line ___70___on figure 2.2 has 70% probability of receiving more than 500 mm rainfall during the period October-April.	

The middleveld ranges from 900 to 1200m covering almost 40% of the central part of the country and 35% of the country that is below 900m and covering mostly the southern part of the country constitutes the lowveld area. Altitude and relief greatly influence the countryôs climate (Dube, 2008).

2.2.2. Climate

The country has been divided into five broad natural regions (NRs) in which the dominant partitioning factor is rainfall (Figure 2.1).

Climatic conditions are largely sub-tropical with one rainy season, between November and March. The rainy season is typically a time of heavy rainfall from November to March. The whole country is influenced by the Intertropical Convergence Zone during January. In years when it is poorly defined, then there is below average rainfall and a likelihood of serious drought in the country (as happened in 1983 and 1992). When it is well-defined then rainfall is average or well above average, as in 1981 and 1985. Only 37% of the country receives rainfall considered adequate for agriculture (Table 2.1) so rainfall is considered the most limiting factor in agriculture (FAO, 2000; Wikipedia, 2011). The reliability of rainfall decreases from north to south and from east to west. Variability ranges from 20% in the north to 45% in the south. The major important feature in Zimbabweôs climate is the erratic rainfall pattern that has led to recurrent droughts (Dube, 2008).

TABLE 2.1; RAINFALL CHARACTERISTICS IN THE FIVE NATURAL REGIONS OF ZIMBABWE

Natural Region	Area (km^2)	% of total	Rainfall Characteristics
I	7 000	2	More than 1 050 mm rainfall per year with some rain in all months.
II	58 600	15	700 - 1 050 mm rainfall per year confined to summer.
III	72 900	18	500 - 700 mm rainfall per year. Infrequent heavy rainfall. Subject to seasonal droughts.
IV	147 800	38	450 - 600 mm rainfall per year. Subject to frequent seasonal droughts.
V	104 400	27	Normally less than 500 mm rainfall per year, very erratic and unreliable. Northern Lowveld may have more rain but topography and soils are poorer.
Total	390 700	100	

Source: adapted from Rukuni and Eicher, 1994 pp.42

2.2.3. Soil types

Two thirds of the country consists of sandy soils, which are derived from granite and are inherently infertile. The soils are heavily leached and have low nutrients. They lack organic matter and other nutrients, which are important for crop production such as sulphur, nitrates

and phosphates. Fertile basaltic soils are predominantly in the low veld where potential for crop production is high under irrigation. The high veld is mostly dominated by heavy clayey soils (Dube, 2008). Soils, to a certain extent, give variation to the vegetation type. The biophysical characteristics such as rainfall, relief, soil and vegetation constitute the five agro-ecological zones for which different farming practices take place.

2.2.4. Overview of Mutasa district

Mutasa is one of the seven districts found in the Manicaland Province, one of the ten provinces of Zimbabwe (Figure 2.3). Mutasa is located on the eastern side of the country. Pockets of agro-ecological zones 1-4 are dotted in the district, which receives a mean annual rainfall of 850mm.Temperatures averages +/- 26 degrees; soils are predominantly sandy with some patches of clay soils. However, in the past seven years the rainfall has been erratic, with most farmers depending on rain fed agriculture being unable to produce enough for their food requirements with the average yield declining from the expected 4 t/ha to 0.1t/ha. The decline has been exacerbated by shortage of inputs such as fertilizer, appropriate seed varieties, inadequate extension services and timing of planting.

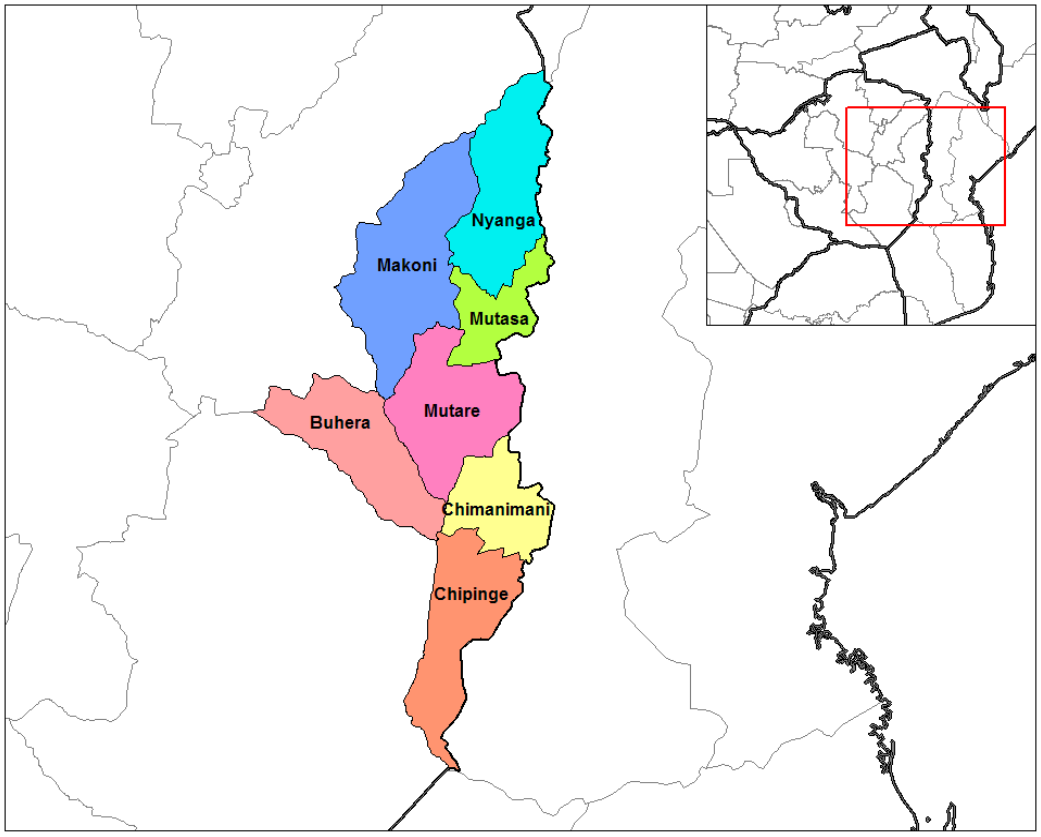

Figure 2.3: Manicaland Province of Zimbabwe

Source: Wikipedia, 2011

In addition, the devastating effects of HIV/AIDS estimated at 15.5% and the continuous rural - urban migration or border jumping to neighbouring countries such as Mozambique and South Africa in search of opportunities among the productive age group poses a challenge to food production. The majority of communal farmers have also lost drought power and the high cost of inputs, and unavailability of inputs have further compounded the challenges rural households face to acquire the necessary inputs they need to realise better yields (Agricultural Technical & Extension, 2008). Most farmers lack the requisite knowledge and skills to manage their farming activities as commercial enterprises. The situation is exacerbated by the high extension worker/farmer ratio, which stands at 1:600. Most of the extension personnel have left the department due to poor remuneration and those still hanging on are demotivated, and lack basic support to carry out their duties such as relevant equipment and transport (WFP-Plan, 2009).

Because of the recurring drought over the years compounded by other limiting factors of production, most households have become food insecure and most vulnerable cases are found among women, elderly persons and child headed households and/or with chronically ill persons. These households have depended on food aid from World Food Program (WFP). In 2008/9 farming season WFP through Plan International[6] provided food aid to an average of 125,000 beneficiaries per month (WFP-Plan , 2009) so as to avert hunger and starvation among the most vulnerable groups in a district that has a population of 250,000 people (CSO, 2002).

2.3. Methodology

2.3.1. Tools

This study employed a participatory approach to capture both quantitative and qualitative data on the coping strategies of the community, households, individuals and institutional capacity within a given rural ward through the eyes and experiences of individuals, households and district level key informants. A desk review of existing data was conducted prior to field data collection to help the researcher appreciate how the community would normally conduct itself in adversity. Such reviews helped guide the direction of primary research and for cross-checking information collected in the field (Holzmann & Boudreau, 2008). Two questionnaires were designed and administered to the community. The first questionnaire was administered in a close-ended format to individuals in the community and the second one of an open-ended format for district level key informant interviews (KII). A third guide was designed and used in focus group discussions (FGDs) at community level.

[6] Plan International- an international Non- Governmental Organization cooperating with WFP in food aid distribution in Mutasa district

2.3.2. Statement of Consent

For ethical research principles for all household questionnaires, a statement of consent was made with each interviewee that reads as follows:

> We are conducting interviews with households in the area in order to understand more about the coping strategies and capacity of institutions with regards to drought in the district. Information collected from interviews will be confidential and no names of people interviewed will be used. Household information will be kept confidential. Please note that there is no benefit or incentive being given to participating in the interview now or in the future. You are free to decline to be interviewed, if you wish, or to decline to answer particular questions if you wish.

2.3.3. Sampling framework

The primary data constituted structured questionnaires that were administered at household level through interviews, community level by FGDs and KII.

Mutasa district, with a total of thirty-one (31) wards was zoned[7] into three regions/livelihood zones. Each ward has an average of eight villages. Each village has an average of 150 households (Census, 2002). A stratified random sampling method was employed. In each of the three livelihood zones, three wards were randomly selected. In each of the three wards, four villages were randomly selected and in each of the selected villages five households were interviewed using the closed-ended questionnaire. Sampling of households was through random stratified sampling at village level. This then translated to a total sample size of 180 households interviewed in the district. While ten per cent of the number of households could be ideal to give a fair and balanced sample, the researcher was limited by inadequate funding for a very big exercise. However, the chosen sample size still gave a representative

insight into the required information. One FDG was conducted per ward and an average of 25-30 individuals would constitute this group. Therefore a total of 9 FDGs were conducted in the district.

Institutions involved in drought mitigation and response (KI- key informants) were each interviewed using the open-ended questionnaire. These KI included the MRDC, the DAÕs office, GMB, department of social welfare, Agricultural Technical & Extension Services (AGRITEX), DLVS, local NGOs, CBOs, VS&L groups, burial societies, religious leaders, Chiefs and village heads. The same institutions also constituted the District Drought Relief Committee (DDRC). At household and village level, information gathered included:

[7]Livelihood zoning ï a delineation of areas within which people share broadly the same patterns of livelihood

- demographics
- vulnerable groups, individuals
- rainfall pattern
- agricultural production,
- market and economic trends
- food availability
- sources of food
- household sources of income
- sources of expenditure
- status of stock and status of capital and assets
- coping strategies/mechanisms
- constraints faced by households/communities to use these strategies
- level of preparedness by individuals
- livelihoods
- Institutions involved in drought mitigation and response.

At key informant and institutional level information gathered included:

- their view of the drought phenomenon
- their mandate with regards to drought
- programs in place (current)
- programs applied (previously)
- capacity
- limitations
- the level of participation of communities of Mutasa
- recommendations.

2.3.4. Data collection

Data collectors (four enumerators) were trained for one day on the methodologies and techniques of data collection in rural context. Simulations were carried out as the basis to ensure that approaches and questionnaires were evenly understood in the team. The objective of training and simulations was to reach homogeneous data collection in order to guarantee the reliability of the collected information. Guidelines and questionnaires were then tested and validated at team level before the actual data collection exercise. The main data collection tools included the household questionnaire, key informant interviews, FDGs and past records on research/surveys in the related field of study.

2.3.5. Pre-testing of tools

In order to check the correctness of the questions and to find out if the subjects had the same understanding of the questions pre-testing of the tools was done. This exercise was of importance in adapting the questions to local cultural settings, thus minimising the risk of conveying ambiguous questions and eliciting inaccurate responses from the local population. Ten men from one ward outside the sampled areas were involved in the pretesting, and afterwards some changes were made in the instruments.

2.3.6. Data analysis

2.3.6.1. Quantitative data

Before entering data in the computer, completed questionnaires were checked daily for errors such as inconsistencies in data filling, data entry and completeness of the data. Every evening, the data collecting team would meet for ± 60 minutes daily to discuss data gathered and trends. That was critical as it enabled the team to reflect on the various aspects of the programme and iron out challenges to make adjustments where possible. Only a few questionnaires were spoilt and these were not further considered for this research. Data analysis was done using SPSS[8] version 18. Descriptive statistics, charts, graphs and frequency tables were produced, then interpretation and presented in Chapter 5.

2.3.6.2. Qualitative data

Analysis of qualitative data from semi-structured interviews from key informants and focused group discussions included ordering of emerging issues in the interviews and making summaries. Sorting and ordering of responses from semi-structured interviews were done manually and grouped into thematic areas.

2.4 Conclusion

The major important feature in Zimbabwe's climate is the erratic rainfall pattern that has led to recurrent droughts. The country has been divided into five broad Natural Regions (NRs) in which the dominant partitioning factor is rainfall. Climatic conditions are largely sub-tropical with one rainy season, between November and March. Two thirds of the country consists of sandy soils, which are derived from granite and are inherently infertile. The soils are heavily leached and have low nutrients. All these factors increase the severity of drought.

[8] A statistical package for social scientists.

A participatory approach was used to gather both qualitative and quantitative data using both closed and open ended questionnaires. A desk review was employed for literature review for purposes of data triangulation and an SPSS version 18 package was used for data analyses. The next chapter reviews drought management in SADC countries, challenges on policies and some countries that have advanced mechanisms to manage drought are discussed as successful models.

CHAPTER 3: DROUGHT LITERATURE STUDY

3.1 Introduction

This chapter reviews drought management in Southern Africa. A 10-step drought plan is discussed and unpacked in detail as a planning tool that can be applied to all countries that are drought prone. While it is noted that most countries in the SADC region have not developed permanent institutional capacity, Botswana has a robust integrated drought early warning system herein outlined.

3.2 Southern Africa

Drought is a chronic problem in sub-Saharan Africa and the most important factor affecting livelihoods of the people in the region (Hagman, 1984; Sear, Campbell, Dambe & Slade, 1999; Wilhite *et al.*, 2000). Yet, the drought risk reduction concept is not at the core of disaster management in most countries of Africa (Dube, 2008). Disaster reduction efforts in Africa have followed a somewhat different course than those in other continents. In Southern Africa, and perhaps more widely across Africa, the field of disaster reduction has never explicitly achieved the same policy stature or secured levels of financial commitment comparable to those seen in Asia or Latin America (Holloway, 2003). This is not only due to the nature of Africaôs disaster risk profile, which has differed from that reflected in other continents. It is also explained by the character of international assistance that has tended to be prolonged aid for refugees/displaced populations or highly visible food and other humanitarian assistance in times of drought and famine (Holloway, 2003).

In part it also reflects the political priorities of Africaôs emerging democracies. In Southern Africa specifically, issues concerning development and national security have been historically associated with struggles for independence and freedom from political, military and other forms of oppression. These preoccupations, rather than concerns for threats triggered by nature, have dominated national and regional security agendas. Even today, despite some progress in favour of democratic governance across southern Africa, actual and potential internal conflict is perceived as and remains the primary threat to national security in several countries (Holloway, 2003).

Despite the limited profile given to disaster management in the region, the protection of national and regional food security was an early strategic priority for the Southern African Development Coordination Conference (SADCC), SADCôs predecessor (Wilhite *et al.*, 2000; UNISDR, 2002). This was reflected in the establishment of a Regional Early Warning Unit

(REWU) in the then SADCC Food Security Technical Advisory Unit based in Harare (Wilhite *et al.*, 2000; Holloway, 2003). The REWU built capacity to monitor and consolidate data on regional food security for each growing season.

During 1997 UNSO compiled a disaster management report on southern Africa countries namely; Angola, Botswana, Lesotho, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe in order to establish the status of drought preparedness, primary drought policy and planning needs and lastly constraints that exist with regards to drought policy and plan development. The study was evaluated from the perspective of the three critical components of a drought plan:

- Monitoring and early warning
- Vulnerability and impact assessment
- Mitigation and response (Wilhite, 2002).

Results indicated a wide range of institutional capacity to respond to drought emergences in Southern Africa. Wilhite, Hays & Knutson (2005) reported that although some countries have detailed organizational structures in place to coordinate the actions of government at various levels, as well as those of partners, such as donors and NGOs, most of the countries have not developed a permanent institutional capacity. The common problem with drought and other natural hazards is maintaining interest in planning beyond the relatively short window of opportunity that follows the event. Interest in drought planning quickly wanes in the post drought period when precipitation conditions have returned to normal or above normal levels. Drought response is coordinated through natural disaster authorities; a case in point is Lesotho, Zambia and Zimbabwe. Drought relief is directed at human relief and no post-response and recovery evaluation are undertaken, hence opportunities to learn from the past are lost (Wilhite, 2002; NDMC, 2007). On a positive note, however, drought and famine early warning systems commonly exist despite the obsolete equipment and poor meteorological networks used; vulnerability of elements at risk are often carried out and economic diversification as a risk mitigation measure is evident (The International Famine Centre, 2002; DNMC 2011).

The International Famine Centre (2002) further indicates that no drought plans existed in Angola, Lesotho, Malawi, Maritius, Mozambique, Namibia, Swaziland, Zambia and Zimbabwe. Some infrastructure does exist in most countries to respond to drought conditions, but on a reactive or crisis management basis. However, Botswana and South Africa clearly stand apart from other countries in terms of their experiences and prevailing

status in drought planning (Wilhite, Hays & Knutson, 2005; UNISDR, 2002). Drought planning in Botswana is part of development planning and institutional structure is well defined. In South Africa, an inclusive forum with all major players is in place and has led a shift from exclusive emphasis on commercial farmers to include communal poor farmers and farm workers (Wilhite, 2002).

3.3 Proposed drought plan

The National Drought Mitigation Centre (NDMC) in the United States has conducted numerous workshops on drought planning in countries such as Brazil and South Africa where their drought plan has evolved around the 10-step process (Wilhite, 1991). The 10-step process has been used by many countries as an organizational tool to facilitate the development of drought plans. It is intended to identify issues that should be addressed with appropriate modifications as per each countryôs objectives. The 10-Step Drought Planning Process, first published by NDMC founding director, Dr Donald A. Wilhite, in 1990, has been applied and modified by states, tribes, and countries around the world. Since then Wilhite and others have revised and updated it to incorporate recent experiences and the growing awareness of awareness of the need for drought planning and mitigation (NDMC, 2011).The 10-step process is summarized in Figure 3.1.

Step 1	**Appoint a drought task force.**
Step 2	**State the purpose and objectives of the drought plan.**
Step 3	**Seek stakeholders' participation and resolve conflict.**
Step 4	**Inventory resources and identify groups at risk.**
Step 5	**Prepare/write the drought plan.**
Step 6	**Identify research needs and fill institutional gaps.**
Step 7	**Integrate science and policy.**
Step 8	**Publicise the drought plan and build public awareness.**
Step 9	**Develop education programmes.**
Step 10	**Evaluate and revise drought plan.**

Figure 3.1: Ten-step planning process

Source: National Drought Mitigation Centre, University of Nebraska, Lincoln, Nebraska, USA.

The 10-step drought planning process is illustrated in Figure 3.1. In summary, Steps 1ï 4 focus on making sure the right people, that is, a multisectoral team is brought together, the people are equipped with clear terms of reference with regards to the process, have a vision and know what the drought plan must accomplish, and are supplied with adequate data to

make fair and equitable decisions when formulating and writing the actual drought plan (Wilhite *et al.*, 2000; Wilhite, Hayes & Knutson, 2005; NDMC, 2011). Step 5 involves the process of developing an organizational structure set for the specific task necessary to prepare the plan and the plan, which should be treated as a process, rather than a discrete event that produces a static document. A risk assessment is undertaken in conjunction with this step in order to construct a vulnerability profile for key economic sectors, population groups, regions, and communities (Wilhite *et al.*, 2000; Wilhite, Hayes & Knutson, 2005; NDMC, 2011). Steps 6 and 7 describe the need for ongoing research and coordination between scientists and policy makers. Steps 8 and 9 detail the importance of promoting and testing the plan before drought occurs. Finally, Step 10 stresses the need of revising the plan to keep it current and evaluating its effectiveness in the post drought period. Although the steps are sequential, many of these tasks are addressed simultaneously under the leadership of a drought task force and its complement of committees (Sear, *et al.,* 1999; Wilhite, Hayes & Knutson, 2005; NDMC, 2011). The steps are unpacked below:

Step 1: Appoint a drought task force

The plan's success depends on political will. A key political leader in the person of the President or Prime Minister should appoint a multidisciplinary drought task force to supervise and coordinate development of the plan.

Step 2: State the purpose and objectives of the drought plan

The drought task force as guided by its terms of reference should state the general purpose and specific objectives for the drought plan. Objectives should reflect the unique characteristics of the region in question.

Step 3: Seek stakeholders' participation and resolve conflict

Task force should identify all groups that have a stake in drought planning, consult and understand their interests.

Step 4: Inventory resources and identify groups at risk

An inventory of natural, biological, and human resources and their vulnerability to drought should be undertaken; constraints to the planning process should be identified.

Step 5: Prepare/write the drought plan

The drought plan should have three primary components: (I) monitoring, early warning, and prediction; (2) risk and impact assessment; and (3) mitigation and response.

Step 6: Identify research needs and fill institutional gaps

The drought task force should identify and consolidate a list of research needs and gaps in institutional responsibility and make recommendations on how to work around them

Step 7: Integrate science and policy

There should be clear consultation between scientists and policy makers as scientists may not be familiar with policy constraints and policy makers may not understand scientific and technical issues associated with drought. A two way communication system between the two groups should be enhanced.

Step 8: Publicize the drought plan and build public awareness

During drought, the task force should keep the public informed of the status of water supplies, conditions that might lead to requests for water use restrictions, and ways to access drought assistance.

Step 9: Develop education programs

Education programs should be designed that will create awareness of short- and long-tern water supply issues.

Step 10: Evaluate and revise drought plan

To remain relevant, the plan should have a robust monitoring and evaluation component characterized by periodic testing, evaluation, and updating of the drought plan that will keep the plan responsive to local, state, provincial, or national needs (Wilhite, 1991; Wilhite, 2002; Wilhite, Hayes, Knutson and Smith, 2000; Wilhite, Hayes and Knutson, 2005; NDMC, 2011.

The ten-step process should be dovetailed to meet each regionôs needs and according to Wilhite (2000) and Sear, Campbell, Dambe and Slade (1999), Botswana is one country in Southern Africa that has a well coordinated national drought early warning system. This system is discussed in detail below.

3.3.1 Integrated drought early warning: Botswana example

Periodic drought is a fact of life in Botswana. The government of Botswana runs a successful drought relief programme that is multisectoral in nature (Sear, *et al.,* 1999; Wilhite, 2000). Environmental information is provided by the Department of Meteorological services and the ministry of Agriculture through the Rangeland Inventory and Monitoring project (Sear, *et al.,* 1999).

The Botswana national early warning system (EWS) for drought was initially set up when Botswana gained independence from Britain in 1966, at which time a severe drought affected the country (Sear, *et al.,* 1999; The International Famine Center, 2002). It was set up to be a

decision tool for central government, to enhance drought preparedness, mitigation and management. The components of a drought preparedness and mitigation plan are the following:

- Prediction - to forecast crises
- Monitoring - to watch what is happening and changing
- Response - to decide on an action that will prevent a crisis
- Impact assessment - to see if a change, or an initiative is working (The International Famine Center, 2002)

The Botswana government took a pro-active approach when there was a general expectation of poor rains. They wished to ensure that no death occurred to its human or livestock populations due to drought. In the 1960s, initially, the focus was on the livestock sector. Later, after experiencing many drought crises, particularly the 1980s when a sequence of severe droughts ravaged the country, the EWS became more refined (Sear, *et al.,* 1999; The International Famine Center, 2002). The focus of the system broadened to include arable agriculture, water and human affairs (Sear, *et al,* 1999; The International Famine Center, 2002).

The Government of Botswana took the EWS as part of the development process. The management of drought disasters was seen a humanitarian operation. It delivered food relief to a large proportion of the rural population of the country. The EWS team was expected to tap into and use the information flows that were already there. They did not start new parallel formal information structures. In this way they built on strengths within various ministries (Sear, *et al.,* 1999).

With time, the EWS has become very efficient at letting the higher levels of government know when there is a forecast problem, this way, decisions are taken quickly. Once a drought is declared by the President (Figure 3.2 and Table 3.1), Botswana is very efficient at delivering food relief within days to target populations (The International Famine Center, 2002).

Botswana is one of a few richest countries in Africa and can afford to ensure that its population, its cattle and its seed grain are not destroyed by recurring droughts. Each farmerôs crop and livestock are insured by the government such that in the event of drought, farmers are assisted to restock their animals or grain. Few other countries in sub-Saharan Africa could afford such investment. The benefits of prompt and efficient relief, following good information flow to aid decision-making is great. This can be seen when Botswana is

compared with other drought-prone sub-Saharan African countries (Sear, *et al.,* 1999; The International Famine Centre, 2002).

3.3.2 Structure of the Early Warning System

The EWS structure is hierarchical in nature (Figure 3.2) with information gathered by various ministries and departments shared in monthly meetings of the Early Warning Technical Committee (EWTC). The secretariat is the Ministry of Finance. The EWTC advices the Inter-Ministerial Drought Committee (IMDC) which meets monthly or bi-monthly as guided by the time of the year (Sear *et al,* 1999). The IMDC has an advisory role and its secretariat is also provided by the Ministry of Finance. The IMDC advises the Rural Development Council (RDC) on prevailing environmental and socio-economic conditions throughout the country. The RDC being the local government is responsible to coordinate rural development activities in their areas of jurisdiction. The RDC depends on information from committees below it to make sound, reliable and useful decisions. In cases were technical information is not available from the IMDC, there is provision for the EWTC to supply such information directly to the RDC, the RDC which then recommends courses of action in drought mitigation and management through the Ministry of Finance to the Cabinet (Sear, *et al.,* 1999).

EWTC members are drawn from various ministries which include the Ministry of Local Government, lands and housing (MLGLH), Ministry of Agriculture (MoA), the department of Meteorological Services (DMS), Ministry of health and the Central Statistical Office (CSO). Chairmen and members of the District Drought Relief Committee (DDRC) also make up the EWTC (Sear, *et al.,* 1999). The primary function of the EWTC is to regularly assess environmental and socio-economic conditions and indicators on ground throughout the country in liaison with each district government twice a year generally in January in the middle of the rain season, and around April at the end of the rainy season. The EWCT undertakes a drought assessment tour, en masse, to the districts to obtain feedback on obtaining conditions, recent past, previous months and seasons and also a local perspective on prospects for the following months. The collected information is then sifted, assessed, summarized and packaged for use by others (Sear, *et al.,* 1999).

3.3.3 Flow of information

The primary data needed to predict drought and also estimate its spatial variability is rainfall. Monthly, rainfall, vegetation condition and fire scar data are compiled and consolidated by the Botswana Department of Meteorological Services (DMS). The data is further enhanced by the Ministry of Agriculture Botswana rangeland Inventory and Monitoring Project (BRIMP), which become a complete package of useful information presented to the EWTC. This

information is crucial to facilitate government decision-making. Besides providing crucial information to the monthly EWTC meetings, the BRIMP and DMS staff report directly to the districts every two months to District administrators who would prefer easier to understand data in order to assess the situation in their areas of regular operation.

The MoA input to the EWTC is co-ordinated by the own Early Warning Unit (EWU). The Unit handles the secondary data not provided by either BRIMP or DMS. It picks up discrepancies and provides a co-ordinated MoA view to the EWTC. The EWU working in conjunction with the EWTC produce the official Botswana food security Bulletin every two months. Regional information from SADC is disseminated by the EWU. The EWU while linked to SADC, its primary role is in national drought early warning within the EWT (Sear *et al,* 1999; The International Famine Center, 2002).

When drought is imminent, some drought relief programmes are activated. This follows declaration as a national disaster or within individual districts (Sear, *et al.,* 1999). In such emergencies, the Nutrition unit of the Ministry of Health works with the MLGLH to implement relief programs. The system of relief distribution to targeted populations is extremely efficient. There is continuous campaigns of monitoring the nutritional status of target populations ï the most vulnerable groups, and to date, the nutritional status of the countryôs under -5s is used as a proxy for the whole population (Sear, *et al.,* 1999). The Relief Intervention Program is based on approved projects and programs already in the National Development Plan (The International Famine Center, 2002).

The major objectives of relief intervention are:

- To prevent human deaths due to drought.
- To prevent a fall in nutrition levels for those groups considered most vulnerable.
- To ensure that there is an emergency water supply for human consumption.
- To make up for income lost by households as a result of drought - this is a labour-based programme.
- To protect the basic assets that households need for their survival, such as breeding stock and animals for ploughing and transport.
- To facilitate recovery and rehabilitation following drought (The International Famine Center, 2002).

The annual schedule for the Early Warning System in Botswana is shown in Table 3.1.

TABLE 3.1: THE ANNUAL SCHEDULE FOR THE EWS IN BOTSWANA

TIMING	ACTION
2nd week Jan	Early Warning Technical Committee (EWTC) meeting to review situational reports and discuss Drought Assessment Tour (DAT).
3rd week Jan	DAT commences.
1st week Feb	DAT ends and report writing commences.
2nd & 3rd week Feb	DAT report reviewed by EWTC then Inter-Ministerial Drought Committee (IMDC).
4th week Feb	DAT report circulated to Rural Development Council (RDC).
1st week March	RDC considers DAT report.
2nd week March	Preparation of memo and circulation to ministries.
4th week March	Consideration of memo by cabinet and drafting of the presidential declaration on drought .
1st week April	Presidential declaration explaining the situation and inter alia announcing or terminating Government interventions, which normally run from 1st July to end of June.
2nd week April to 4th week May	Mobilisation and consultations regarding actions from the declaration.
1st week June	RDC meeting and IMDC reports on actions from March meeting and also gives update montly.
1st week July	Commencement of relief interventions if drought is declared.
4th week July	2nd DAT commences.
1st week Aug	2nd DAT ends and reports are prepared and processed through EWTC and IMDC within the fortnight
3rd week Aug	2nd DAT report circulated to RDC.
1st week Sept	RDC considers report. IMDC also reports on progress of implementation of June Drought
2nd week Sept to 1st week Dec	Follow up on issues of September RDC. EWTC and IMDC prepare situational report for 4th week Nov.December RDC. Plans for Jan DAT also initiated. RDC considers situational update. Jan. DAT itinerary sent to all districts.

Source: The International Famine Centre, 2002

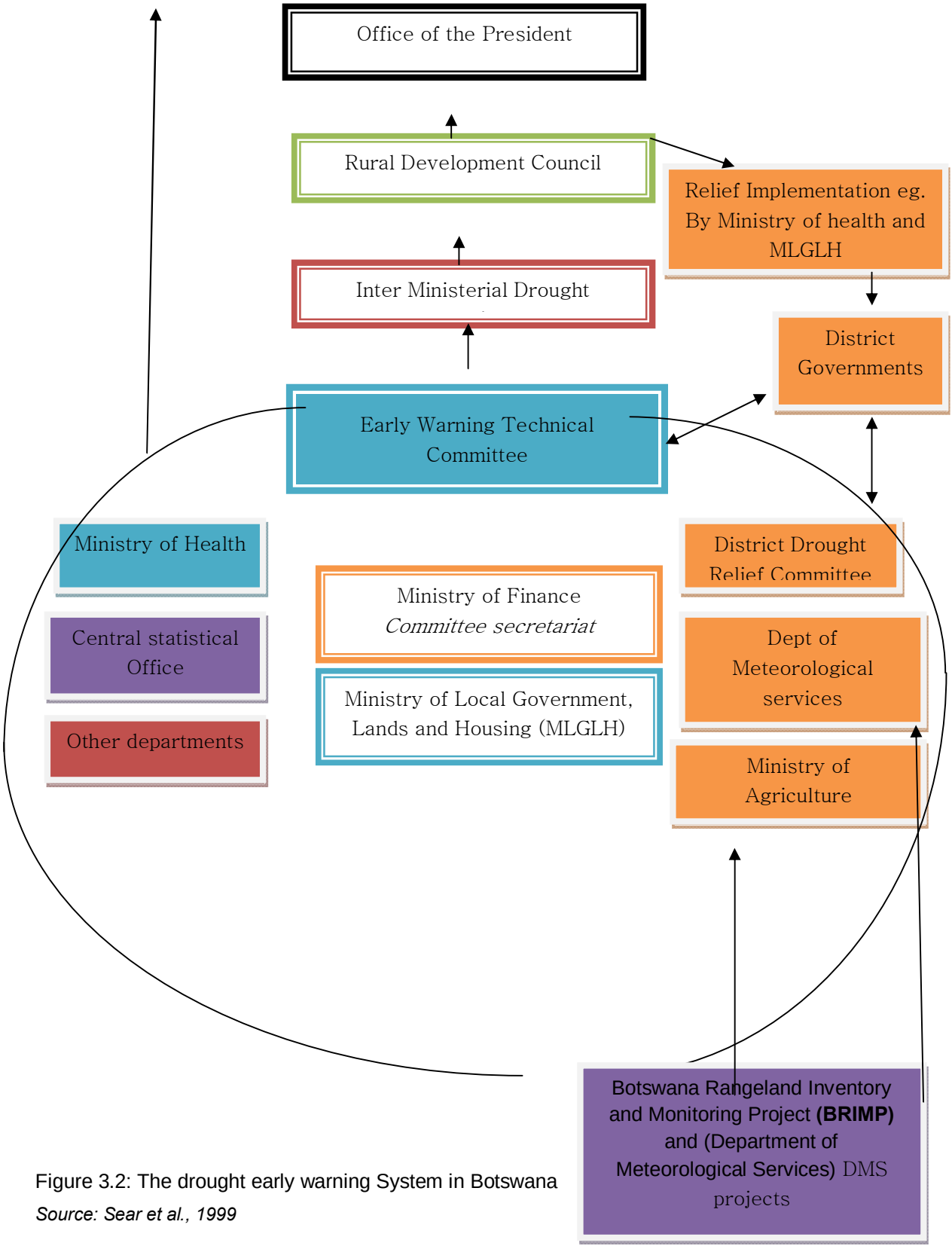

Figure 3.2: The drought early warning System in Botswana

Source: Sear et al., 1999

3.3.1 Challenges of the Early Warning System

It is clear that there is poor communication between central technical committees and district representatives outside formal drought assessment tours. Decisions made on drought and information thereof from the central government to districts and village levels is not disseminated in an understandable form. Despite investment in drought management, lack of understanding at community levels that drought is a chronic problem is very worrying (Sear, *et al*., 1999). There is also limited prevention and mitigation built into these plans in addition to the fact that drought planning quickly wanes in the period immediately after the dry period following rains.

3.4 Conclusion

Drought is the single most important factor affecting livelihoods in Southern Africa, but drought risk is not yet well managed. Most countries have the infrastructure to plan for drought, but the planning has been on a crisis or response basis. Botswana and South Africa stand out as countries with robust drought management systems in sub-Sahara Africa. A 10-step drought plan presented by the USA is a useful tool for drought management that can be adopted by drought-prone countries. It can be dovetailed by each country to meet its own context. The next chapter deals with the legal framework that guides drought management in Zimbabwe and the drought coping strategies employed at both household and community level.

CHAPTER 4: DROUGHT IN ZIMBABWE

4.1. Introduction

In this chapter the reader will be introduced to the legal framework that guides disaster management in Zimbabwe. This is the Civil Protection Act of 1989 (chapter10:06) and other complementary sections of the law that support the Act. The last section discusses vulnerability and drought. It further reviews coping strategies employed by the drought-prone communities.

4.2. The legal frame work in disaster management

The Civil Protection Act 5 of 1989 (Chapter 10:06) is the principal act and regulatory framework that guides and regulates disaster management in Zimbabwe (UNISDR, 2004). The Civil Protection Act is complemented by other sections of the law (MLGPW &UD, 2006) such as Environmental Management Act (Chapter 20:27) of 2002, the Health Public Act (chapter 15:09), the Rural District Councils Act (Chapter 29:13), the Urban Councils Act (Chapter 29:15), the Regional Town and Country Planning Act (Chapter 29:12), the Defence Act (Chapter 11:02) and the Police Act (Chapter 11:10) which have some relevant sections in disaster management.

It is National Policy for Civil Protection that every citizen of Zimbabwe should assist where possible to avert or limit the effects of disaster. As provided by the Zimbabwe Civil Protection Act of 1989, central government initiates hazard reduction measures through relevant sector Ministries with the local administration taking the responsibility for implementing its effectiveness (UNISDR, 2004; MLGPW &UD, 2006).

The Department of Civil Protection under the Ministry of Local Government, Public Works and National Housing was mandated to spearhead disaster risk reduction and response. The Department had the overall co-ordination of all relevant disaster management stakeholders. The system used the existing Government departments, private sector, and NGO organizations whose regular activities contained elements of disaster risk prevention and community development. The structure of the civil protection system is illustrated in Figure 4.1.

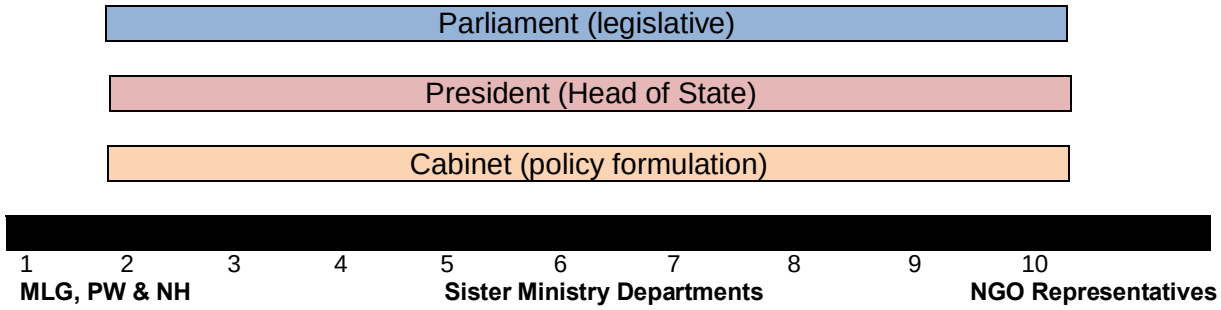

Figure: 4.1: the Structure of Zimbabwe Civil Protection System
Source: Adapted from MLG, PW & NH (2006)

The major priority components of the current Act that enables its implementation include the organisational structure of civil protection in Zimbabwe from the Local Authority level to the National level, formation of the National, Provincial and District Civil Protection Committees and their subsequent sub committees, the component of planning for emergencies/ disasters, the establishment of a Civil Protection Disaster Fund and procedures of declaring a State of Disaster (MLGPW &UD, 2006; Civil Protection Act, 2006).

However, due to some shortcomings in the current Act, the country has engaged in a process to review its legislation since 1995 in an effort to strengthen disaster risk reduction. It is anticipated that the process will end with the repeal of the current Civil Protection Act to be replaced by the Emergency Preparedness and Disaster Management Act which will provide a legal basis for the establishment of an Emergency Preparedness and Disaster Management Authority whose major functions include developing a risk reduction strategy in order to minimize vulnerability to both natural and man-made or technological hazards (MLGPW &UD, 2006)

The National Civil Protection Coordinating Committee (NCPCC) chaired by the Director in the department of Civil Protection is responsible for the formulation of the National Civil Protection Plan. The NCPCC as empowered by section (41) (2) of the Act executes civil protection functions. The NCPCC consists of senior Government officers from government departments, parastatals and NGOs. At provincial and district level, the same structure exists and is chaired by the Provincial Administrator (PA) and District Administrator (DA) and called the Provincial Civil Protection Planning Committee (PCPPC) and District Civil Protection and Planning Committee (DCPPC), respectively.

Planning for emergencies in Zimbabwe is done at various levels namely (i) sectoral level, (ii) local authority, and (iii) district, (iv) Provincial and (v) National levels. As provided for by the Civil Protection Act, all these levels are required to produce operational emergency preparedness and response plans which they activate during emergencies/disasters. The

National Civil Protection Plan forms the overall framework for the promotion, co-ordination and execution of emergency and disaster management in Zimbabwe. The localised plans should dovetail in to the National plan (MLGPW &UD, 2006).

4.3 District Level

There are 55 District Civil Protection Units corresponding to the 55 administrative districts. A ñDistrictñ, which forms the smallest civil protection unit, is headed by the District Administrator, assisted by a District Civil Protection Planning Committee. The same multisectoral approach is reflected at all levels. Each area may appoint sub-committees to cover the following sectors:

(i) Public awareness/relations
(ii) Manpower and Training
(iii) Supplies
(iv) Telecommunications
(v) Transportation
(vi) Health and Welfare
(vii) Emergency Management.

Based on the national policy that *"every Zimbabwean citizen has a responsibility in the event of a major disaster or local emergency, to assist, where possible, themselves and their community",* the understanding and cooperation of the public, in order to obtain full value for the preparedness process, the interaction between the emergency authorities and the public are enhanced by programmes of education and information designed to ensure that the public would, in time of disaster, react intelligently and promptly (MLGPW &UD, 2006).

4.4 Current challenges with the legislation and practices

Political will is amply demonstrated by the existence of the legal enabling statute, which creates the conducive environment in which a dedicated disaster management department was spawned. The institutional framework, appropriate policy development and legislative codes all flow from the corporate commitment. However, it is without challenges. The Government of Zimbabwe has not yet developed a database on disaster risk reduction. Information is still being managed at institutional level through sharing reports, minutes, newsletters, and email facilities (MLGPW &NH, 2006). The Department has no modern infrastructure that facilitates communication and networking between disaster risk reduction institutions and research centres. However, the recently developed bill has the provision to facilitate communication and networking through the establishment of a disaster management centre where relevant stakeholders would be housed and linked together (MLGPW &NH, 2006). It is noted that funds for the envisaged centre are still yet to be

secured. By and large, information is disseminated through the press, by pamphlets and road shows. Budgetary constrains limit the use of the electronic media whose effect is far reaching. While the act provides for the establishment of the Disaster Fund, many a time, the Fund is not able to fulfil all disaster management needs throughout the year.

Where more resources are required in the event of major disasters occurring at any given time, the enabling legislation has a provision through which the Treasury can inject additional funding, but normally these funds are diverted from other developmental projects, which either have to be suspended or deferred. The finance budgeted by the government for a year is inadequate and as a result local provincial and district structures are not provided with a budget to finance these disaster management activities. It is therefore difficult to conduct these activities without proper funding. In addition, some parts of the country remain remote such that radio, television and telephone services are still poor to a point where it is difficult to share early warning on imminent disasters in those areas (Dube, 2008)

4.5 Institutional intervention

As stipulated by the Act, every citizen or institution has a role to play in disaster management in the country. As such, many institutions at district level are involved in activities to do with disaster management. Activities at district level are coordinated by the DA. For example, in Zimbabwe drought emergencies at district level such as Mutasa are coordinated by the District Drought Relief Committee (DDRC), a committee comprised of district level stakeholders such as the District Administrator's office (DA), Agricultural Extension & Technical Services (AGRITEX), Livestock Production department (LPD), Veterinary Services department (DVS), department of Social Services (DSS), the Grain Marketing Board (GMB), the Rural District Council (RDC), NGOs and other relevant stakeholders that may be co-opted in the committee. However, activities of this committee are not pro-active and do not have the resources to carry out its mandate. The committee is reactive, only meeting when there is a disaster, which requires the distribution of maize and other inputs from either the NGOs or the government controlled Grain Marketing Board (GMB) (Dube, 2008).

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As noted, various institutions were involved in drought management in rural Zimbabwe including government departments, traditional institutions and NGOs. The private sector was not very visible in drought management, only NGOs were involved in different aspects of drought risk reduction; many offering short-term assistance (relief services) that satisfied immediate needs. Some provided technical assistance and financial/material support for initiatives that helped communities in rebuilding their livelihoods. Major activities included, harnessing of surface and ground water, rehabilitation of water sources, small livestock

support, agricultural inputs, supporting irrigation schemes, supporting conservation farming, promoting planting of drought tolerant crops, promoting small gardens, food relief and capacity building in various aspects of drought coping and risk reduction (Ndlovu, 2010).

A survey carried out by Ndlovu (2010) indicates that informal institutions have not played a major role in drought risk reduction. Their role (e.g. Chieftainship) has only been limited to food distribution activities. Ndlovu (2010) further observes that traditional norms and beliefs are no longer effective in reducing land degradation because law enforcement is now weak. This may continue for some time in future in view of the growing population pressure on the environment.

A number of challenges impede the implementation of drought coping and risk reduction initiatives by many institutions. Government departments are commonly constrained by inadequate resources (both financial and material) to implement programmes; they do not have the resources for training farmers. Most farmers lack the requisite knowledge and skills to manage their farming activities as commercial enterprises. The situation is exacerbated by the high extension worker farmer ratio, which stands at 1:600. Most of the extension personnel have left the department due to poor remuneration and those still hanging on are demotivated and lack basic support to carry out their duties such as relevant equipment and transport (WFP-Plan, 2009).

Most NGOs have a small number of staff, based at district level and not at ward or local level making monitoring of NGO projects weak. Challenges common to both NGOs and Government departments include political interference in day to day activities that sometimes derail implementation of drought risk reduction activities. The existing economic environment has also led to high staff turn-over in most government departments and shortages of inputs and materials required for drought risk reduction. The current global economic crisis will further exacerbate the situation as it has already started affecting funding inflows for some NGOs (Ndlovu, 2010).

The recurrent droughts have made it difficult for communities to recover, resulting in a continuous need for drought relief. The strategic grain reserve for the country is a central government responsibility carried out by the Grain Marketing board, which is a parastatal. It maintains the reserve both in grain and in cash. Grain silos are situated in the northern parts of the country. However, a number of temporary sites are created to cope with emergencies. During sustained periods of droughts importation of grain takes place. Such importation may require assistance from the international community through the UN-WFP donors and their

implementing partners. The GMB, which used to be a strategic grain reserve had lost the capacity to provide for locals after the industry was deregularised (FAO, 2004). GMB used to enjoy the monopoly as the sole buyer of grain in Zimbabwe. Deregularisation of the industry saw entry of new players that outcompeted GMB and had since failed to buy enough grain for its strategic reserve mandate and left the population vulnerable in the event of a major drought (FAO, 2004).

Drought relief programmes have been implemented in Zimbabwe to avert hunger and famine. Some of the government drought reliefs objectives have been to prevent hunger, starvation, malnutrition and disease outbreaks, reduction of malnutrition of the under fives through supplementary feeding and protection of the asset base of rural households from distress sales of assets (GoZ, 2005). Eldridge (2002) and Munro (2006) have raised pertinent issues on the food relief in Zimbabwe. While vulnerable households have benefited from food aid, food was targeted at communal farmers in food deficit areas in significant quantities and high regularity. The programme kept moving into food deficit areas during drought thus averting hunger and starvation. However, food aid programmes failed to reach large numbers of its target group (Munro, 2006). Eldridge (2002) augured that famine was avoided in the 1991/1992 drought by the activities of those affected by drought than relief itself. Even the beneficiaries of the food aid would employ other strategies such as harvest of wild fruits, casual labour and sell of livestock in exchange for grain and remittances of cash and groceries from relatives in urban areas, because the food that vulnerable households received only lasted for a few days before the next distribution date the following month due to inadequate quantities.

Despite the important role played by livestock, during and post drought periods, very little support has been extended to livestock farmers to save their animals during drought periods (Eldridge, 2002). Work summarized by Dube (2008) shows that livestock are critical assets in both disaster response and mitigation. Livestock are useful in providing income and land preparation. There is a positive correlation between the number of cattle owned and land size cultivated as reflected in Table 2.2. Those farmers with at least five head of cattle produced at least eight bags of grain from the land cultivated while those with fewer cattle had a correspondingly poor harvest. Ownership of cattle enabled farmers to be flexible in their cropping patterns and also afforded them the opportunity to plough as much field as they desired, yet farmers without draught animals found it difficult to plough large enough pieces of land for adequate household grain. They could not take advantage of early showers and the erratic rainfall distribution to plant as they wished since they had to wait and

hire bullocks from owners after completing their own land preparations. They were thus limited to cultivate land and were mostly affected by dry spells.

It is again reported by Dube (2008) that the amount of harvest ultimately relate to household food situation as indicated in Table 2.3. Those with a poor harvest or serious food deficit, end up coping by reducing the number of meals per day or overall reduction of meal sizes (Dube, 2008; WFP-Plan, 2009). In addition, Dube (2008) observed that food supply and food access situation were worse off in 2002 compared to 1992. That had primarily been due to lack of carry-over stock in 2002 compared to 1992. In addition, 2002 was characterized by low capacity of the country to import maize and very little donor interest. The country experienced a severe shortage of foreign currency due to a decline in export of cash crops.

TABLE 4.1: DROUGHT POWER, SIZE CULTIVATED LAND AND CROP YIELD.

Responded	Type of draught power		Cultivated land (Ha)	Crop yield (90kg - Bags)
	Cows	Donkeys		
1	0	2	2.5	1
2	2	2	2.5	1.5
3	0	3	1	1
4	30	6	1	2
5	1	0	1	0
6	5	0	2.5	8
7	0	0	2	0
8	5	5	2	10
9	0	0	No fields	0
10	15	3	3	13
11	1	0	1	0
12	5	0	4	21
Total	54	15	22.5	57.5

Source: Dube (2008).

TABLE 4.2: SIZE OF HARVEST AND HOUSEHOLD FOOD SITUATION

Responded	Cultivated land (Ha)	Crop yield (90kg - Bags)	Duration of food supply (months)	No of meals/day
1	2.5	1	5	3
2	2.5	1.5	4	2
3	1	1	1	2
4	1	2	2	3
5	1	0	None	2
6	2.5	8	8	2
7	2	0	None	3
8	2	10	18	3
9	No fields	0	None	2
10	3	13	7	2
11	1	0	None	2
12	4	21	12	3
Total	22.5	57.5		

Source: Dube (2008)

4.6 Irrigation development

The Government of Zimbabwe (GOZ) has recognized the role of irrigation development as a key drought mitigation measure. Tremendous strides have been made by the government, the private sector and the donor community in the area of irrigation development since independence in 1980. It is estimated that 120 000 ha are under irrigation (FAO, 2000). The report further mention that in general, yields achieved on smallholder schemes are higher than rain fed dry-land yields in communal areas. Gross margins for irrigating farmers were significantly greater than for dry-land farmers. The effect of irrigation on increasing crop production and incomes is even more marked in the dry winter season, when dry-land production is impossible because of lack of rain. With a more integrated approach smallholder irrigation can be the basis for rural development and improved standards of living among Zimbabwe's rural communities. In areas of very low rainfall, as in Natural Regions IV and V, (Figure 2.4) farmers enjoy the human dignity of producing their own food instead of depending on food handouts from the Department of Social Welfare (FAO, 2000).

4.7 Vulnerability and drought

Climate variability is the single most important factor affecting the livelihoods of the people in the region, but drought risk is not yet well managed (Sear, Campbell, Dambe &Slade, 1999). Severe droughts in 1980s, 1990s, and 2000s to date, have significantly reduced agricultural production and disrupted national economies (Sear, *et al.,* 1999). Concern is now growing that drought might become more frequent in the region as a result of global warming (Sear, *et al.,* 1999; ISDR, 2002; Bang & Sitango, 2003). If this occurs it will exacerbate problems for vulnerable households, communities and economies. Drought has actually caused more socio ï economic damage than any other hazard in the whole world (Wilhite, 2000; Wilsner, *et al.*, 2004).

However, drought has no structural and physical impact, which to some extent has hindered the development of accurate, effective, reliable and timely estimates of its severity and ultimately, the formulation of drought contingency plans by many governments in Africa (Wilhite, 2000).

In disasters such as drought, a geophysical or weather related event is implicated in some way as a trigger event or a link in the chain of causes. Even when such a natural hazard appears to be directly linked to loss of life, there are social factors that need to be considered involved in causing peopleõs vulnerability (Wilhite, 2000; Wisner, *et al.,* 2004). Vulnerability is a function of social, economic and political processes that determine how a hazard event would affect people in varying ways (Wilhite, 2000). Furthermore, human activities can

modify biological events in the long run such as deforestation or many years later such as the introduction of new animal or seed. Until the emergence of the idea of vulnerability to explain disasters, many views have been of the idea that disasters are as a result of natural hazards (Wisner, *et al.,* 2004). Vulnerability is a function of factors that influence the degree to which someoneøs life, assets and livelihood are prone to damage by a discrete and identifiable hazard. Some people are more prone to damage or loss in the face of a different hazard and variations in impact are also a result of differences in wealth, caste, ethnicity, gender, health and physiological status, disability and age, immigration status and types of social networks (Dercon, 2002).

Vulnerable people are those that find it difficult to reconstruct their livelihoods following a disaster such as drought. In general the poor suffer more from drought than the rich (Wisner, *et al.*, 2004). While vulnerability and poverty are not synonymous, the two are highly correlated. For example, drought may cause moisture stress leading to destruction of crops and livestock in an area. Firstly the rich may lose more animals in quantitative terms say ten out of twenty animals but still remain with a portion of the herd for restocking in the near future even including cross breeding and supplementary feeding. Yet, the poor loses all the three animals he has.

Secondly, the rich have an option to send their animals for relief grazing if the duration of drought is to continue in the area while the poor on the other hand may have to watch helplessly as the animals succumb to drought. Because livestock are also used for draft power, the poor become more vulnerable to a future drought since they cannot even till their land more productively due to lack of draft power.

Thirdly, the impact of drought is much more severe for the poor than the rich. Even if all livestock were wiped out by drought for both the poor and rich, assets for the rich are in many cases insured against local risk and usually have savings and are credit worthy. They can still mobilize their savings and purchase other livestock or still approach a bank for a restocking loan. The poor, by contrast, may fail to ever restock again following death of all their livestock (Dacron, 2002; Wisner, *et al.*, 2004).

However, many vulnerability aspects are temporary and will change with changes in life stages such as marriage, age, immigration status and land ownership, occupation (Wisner, *et al.*, 2004). These changing factors also influence, to a greater extent, the coping strategies of the same people in adversity, and so determine survival. Rural households normally protect themselves against the adverse impacts of drought through coping strategies. Households at risk have developed sophisticated (*ex ante*) risk-management and (*ex post*) risk-coping strategies (Dercon, 2002; Mombeshora, *et. al*., 1995).

Since drought is a recurrent event in Zimbabwe, coping strategies in the face of drought should be fast improving. Dercon (2002) and Mombeshora, *et al.,* (1995) report rural households resorting to income diversification, through combining activities with low positive covariance and income-skewing, for example taking up low risk activities even at the cost of low return. In practice, this implies that households are usually involved in a variety of activities, including farm and off-farm activities, use seasonal migration to diversify, etcetera or focus on low risk activities even at the cost of a low return.

While Wisner, *et al.* (2004) suggest income diversification to reduce drought disaster risk, Dercon (2002) argues that entry constraints for the poor who are most vulnerable limit the usefulness of income diversification. Informal risk-sharing only provides limited protection, especially for some of the poor and their sustainability during periods of change is in doubt. Public safety nets are likely to be beneficial, but their impact is at times limited while they may have negative externalities on households not covered by the safety net (Dercon, 2002). Risk-coping strategies may also involve attempting to earn extra income when hardship occurs. Kochar (1995) as cited by Dercon (2002) reports increased labour supply as the key response in the ICRISAT villages of Ethiopia. The literature on coping strategies when famine strikes also regularly report attempts to earn additional income through a reallocation of labour, including temporary migration, earning income from collecting wild foods (also for own consumption), and gathering activities (such as increased firewood collection).

4.8 Coping strategies

Coping is the manner in which people act within the confines of existing resources and range of expectations to achieve various means (Wisner, *et al*, 2004). It does not only involve the management of limited resources but how it is done in unusual, abnormal and adverse situations. Resources may include land, livestock, draught animals, seed for crops and labour. To mobilize resources people should be entitled to command them which can be through exercise of rights, using the market, calling upon obligations or even through theft and violence (Ndlovu, 2010). While the major objective of coping strategies is usually assumed to be survival in the face of adverse events, such an approach masks other important purposes as explained by Maslowôs hierarchy of human needs (Wisner, *et al.*, 2004). It is important not to oversimplify and over-generalise the expectations and priorities of vulnerable people in disasters.

When people know an event may occur in the future in a similar pattern as it has happened in the past, they set up ways of coping with it. Such coping strategies are guided by the

assumption that the event will follow a familiar pattern and that peopleôs earlier actions will be reasonable guide for similar events. This is common in some social environments where some disasters have such precedents, and some traditional early warning signs have been employed to predict the rain seasons; a drought indicator, *Strychnos madagascas-rensis* (Umwawa/mukwakwa) shown in Figure: 4.2 will bear a lot of fruits in drought years (Ndlovu, 2010).

Traditional early warning systems are based on three precepts. Firstly, farmers must have detailed knowledge of when the major rains should arrive ï understanding what is implied about the probability of future rain by variance in wind, humidity, and temperature from expected conditions. Secondly, farmers need to know how to interpret the behaviour of animals and plants, which serve as valuable indicators for subtle fluctuations in temperature and humidity. Appropriately interpreted, local communities can forecast major rains months before their arrival. Similarly, the absence of these natural indicators suggests the absence of rain i.e. drought. Thirdly, observed historical trends allow for reasonable predictions of future weather patterns. However, the increasing severity and frequency of drought over the last decade has rendered this latter form of forecasting less reliable than it has been in the past (Pratt, 2006). However, some hazards have long return periods that the precedents are imperfectly registered.

Figure: 4. 2. *Drought indicator, Strychnos madagascas-rensis (Umwawa/mukwakwa) will bear a lot of fruits in drought years (Ndlovu, 2010)*

Coping strategies may take forms, some of which may even be prescribed and discouraged by members of a social group or gender. Following destruction of livelihoods assets and means, women and children are at danger of using sex as a survival strategy (Natrass, 2002). It has been observed elsewhere that economic factors reinforce unsafe practices especially where sex is a currency by which African women and girls are frequently expected to pay for lifeôs opportunities, as permission for crossing borders, passing a grade at school to a trading license (UNAIDS, 1999). Poverty exacerbates the situation by encouraging women to engage in sex as an economic strategy for survival (Nattrass, 2002).

Building up of stocks of food and other saleable assets is cited as one important coping strategy of rural households (Dercon, 2002; Wisner, *et al.,* 2004; Ndlovu, 2010). Rural people who have access to land often store grain and other staple food. This is an important buffer against expected seasonal shortages, as well as prolonged periods of hardship. Livestock farmers may follow a strategy of increasing their herd size in years of good rains and grass availability in order to maintain the herd size in the inevitable bad years with high mortality.

A study done by Ndlovu (2010) in Bulilima and Mangwe districts of Zimbabwe observes that asset disposal has increased over the years with the selling of cattle and small livestock such as goats and chickens being the most popular coping strategy in the two districts. As well as providing income during a period of drought, selling cattle does have the benefit of reducing the herd size so that not all livestock die due to a shortage of feed. Some cattle may be sold to buy supplementary feed to save other cattle during drought years. Although the selling and consumption of small livestock, especially chicken and goats, was common to most of the households who had them, this coping mechanism did not significantly reduce vulnerability because of the little money they fetched on the market. The selling of assets, if relied upon too much, can in the long run increase drought risk, as communities will not have enough productive assets to prepare for future droughts.

Davies (1996) indicates that buying and selling cattle is generally recognized as a common strategy to cope with income fluctuations due to drought in many rural areas. However, a relatively large proportion of households often do not own any. Dercon (2002) finds that only half the households in a sample in Western Tanzania own cattle, even though cattle are important in the farming system and in their culture. It is not that other households simply choose to enter into other activities; rather, investing into livestock requires a sizeable surplus: livestock are expensive. A cow, for example, costs about a fifth of an average crop income. Cattle ownership is generally determined by endowments in male labour and land,

suggesting that those with a poorer endowment cannot generate sufficient means to enter into cattle rearing, leaving them relatively more exposed to income risk (Dercon, 2002). More generally, the failure to cope with drought effects is not only reflected in household consumption. Effects on nutrition, health and education are also observed, as are intra household consequences. Children are often taken out of school in response to adverse income shocks; the result is lower accumulation of human capital (Dercon, 2002).

Ndlovu (2010) has observed that in many rural areas where livestock provide a major source of income, during the wet season rangeland forage is of adequate quality and quantity for livestock to thrive, but grazing declines from April onwards such that by August/September, livestock need supplementary feeding to sustain growth rates and prevent loss of summer weight gains and body condition. Some farmers meet this feed requirement from grown pastures or multi-purpose trees and crop by-products. After the catastrophic droughts of 1999/92 and 1993/94, the approach to handling drought has changed. Since then communal farmers have become more responsive to drought so that culling and selling some stock, lease grazing and hand feeding of animals for survival has now been widely adopted. The chosen course of action depends on the farmers' circumstances i.e. resources at his/her disposal, severity of the drought, market availability and veterinary movement restrictions. However it is still a common practice that a *"do nothing*ò approach is the first strategy employed by all farmers. In the long term, the most sustainable approach to drought mitigation is establishment of *"strategic fodder reserves"* through planting of fodder crops, conservation of forages and storage for use at strategic times. This should be accompanied by a pre-prepared drought plan (Chinembiri, 1999).

Diversification of production is regarded as one most important risk-averse strategy with the farming people. Usually their production involves mixed cropping, intercropping, the cultivation on non-staple root crops and use of kitchen gardens. This strategy provides a surplus in good years since it is normally planned on the basis of meeting subsistence needs in bad years (Wisner *et al.,* 2004). It should be noticed that diversifying production makes use of environmental variations and provides the best chance of an optimum yield under all variations of weather and plant pests.

Income diversification is very common among rural households these days. It becomes even more important following a drought that temporarily disrupts farm and livestock production. Black smiting, charcoal making, honey collection and crafts have increasingly become important since they do not suffer directly from the impact of drought or climate change. Wisner, *et al.* (2004) noted brewing beer as an important source of income, especially for

women and drought reduction of beer ingredients can affect their income and nutrition. However, some coping strategies such as charcoal production can be effective in the short run while they undermine the basis of livelihood in the long run in the form of de-vegetation, soil erosion and finally desertification.

Migration has been cited by Dercon (2002) as one of the coping strategies in drought disasters. Migration comes with a lot of challenges though (Bradshaw, 2004). Following a disaster as has been the tendency worldwide many male head of households migrate resulting in an increase in the number of female headed households. The reasons are twofold: frustration at not being able to fulfill oneôs role as breadwinner; and the intention to seek work and send remittances to the family, even when they do not subsequently do so. For women who have to remain behind, the impact is twofold: not only await a remittance that take time to arrive, but also be left without subsistence resources, because in order to finance the migration, the household (i.e. the man) has to sell assets such as livestock or the house (Bradshaw, 2004). The impact on women of migration by male heads of household has more than just a financial dimension: women must assume headship of their households and the responsibilities that this entails (Bradshaw, 2004).

In adversity people also rely on social support networks. These include rights and obligations between members of the same household and with other wider groups with a shared identity such as a clan or tribe (Dercon, 2002). Parents may influence strategic marriage partners for their daughters or sons into a comparatively wealthy family to call on resources in difficult times. There are also wider obligations from the whole community to assist those facing acute hunger and some public assistance and food aid from a number of Non Governmental Organizations have been very helpful in Mutasa district. At the same time, sources of household income other than the dominant one may be employed, such as casual labour, petty trading, cross border trading and artisanal work.

There is also sale of household disposable assets that do not undermine future productive capacity such as small stock and building material. However, as crisis deepens, sale of more productive assets such as ox for ploughing, agricultural implements and early marriages may have to be arranged. It is clear that these strategies do not seem to try maintaining an adequate food intake for a household but instead are aimed at preserving the means for continuing the householdôs livelihood after the drought. As highlighted, food aid in Mutasa has been very helpful to meet food deficit requirements for many vulnerable households. It was observed that in the 2008/9 farming season WFP through Plan International provided food aid to an average of 125,000 beneficiaries per month (WFP-Plan reports, 2009) so as to

avert hunger and starvation among the most vulnerable group in a district with an estimated population of 250,000 people (2002 census). However, food aid has created dependency such that some households no longer see the need to cultivate their fields (Dube, 2008).

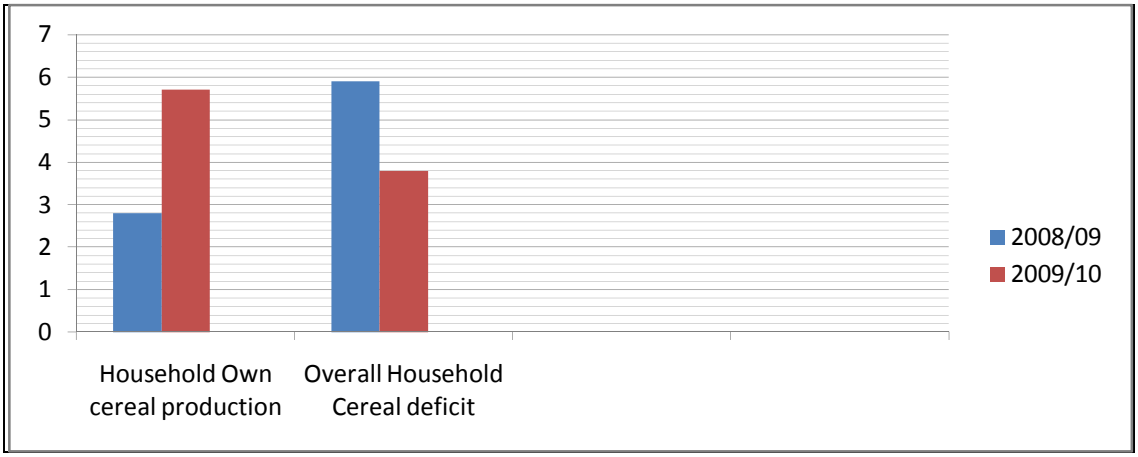

Figure 4.3: Own household cereal production and overall cereal deficits for the year 2008/09 and 2009/10

Source: ZimVAC Interim Rural food Security Assessment (2010)

Studies done by ZimVAC in 2010, (Figure 4.3 above) reveal that for the past two seasons for the year 2008/9 and 2009/10, own cereal production has not been adequate for family consumption. As such these households in Zimbabwe have been employing a number of coping strategies for consumption such as: casual labour, market gardening, sale of non food crops such as tobacco and cotton, livestock sales and bartering, gold panning, remittances; most pronounced in districts closer to the borders with South Africa and Botswana, fishing near lakes, rivers and dams, petty trading, fruit sales; most pronounced in Mutasa and Chimanimani districts and non agricultural employment (ZimVAC, 2010).

A monitoring survey done by Plan before vulnerable group feeding of year 2009/10, revealed that all people interviewed had access to arable land in Mutasa district and 95% of these managed to cultivate their respective fields during the previous summer. Most of the households only had few cereals in stock though. However, movement of stock from farmer to farmer was taking place at a higher level. Community coping strategies were varied as shown in Table 4.3. A relatively high level of entrepreneurship in producing and/ or buying and selling vegetables was indicated. Despite the fact that other households had cash after selling vegetables; the challenge was that of access to cereals due to relatively low amounts stored by farmers. The survey estimates are summarized in Table 4.3 below.

TABLE 4.3: HOUSEHOLDS LIVELIHOODS COPING STRATEGIES AND METHODS

Livelihoods strategies	Percentage (%) of the population deriving food from these activities as at Sept. 2009
Major sources of cereals in stock:	
▪ Own production	30
▪ Purchases	18
▪ Casual labour	35
▪ Borrowing	7
▪ Gifts	8
▪ Food aid	0
▪ Barter	2
Major sources of income	
▪ Vegetable sales	23
▪ Casual labour	60
▪ Petty trade	5
▪ Gifts	5
▪ Formal employment	2
▪ Skilled trade	0
▪ Remittance – monthly	0
▪ Remittance- once a while	0
▪ Formal crop sales	5

This is a summary of Mt. Jenya, Murowe, Mudenda and St. James areas in Mutasa district as at September 2009.

Source: adapted from the October 2009 Monthly Monitoring report by Plan International, Zimbabwe

Farmersôresponses to the effects of drought have been varied (Shumba, 2001). In the work done from some districts of Nyanga, Chipinge, Mudzi, Chivi and Gwanda districts of Zimbabwe farmers have tried a mix of strategies in risk reduction in the face of drought. It has been reported by Shumba (2001) that many farmers were learning permaculture and practising it, both in their gardens and fields. Permaculture helps them prepare for drought through land use designs that enhance water conservation and bio-diversity. A significant proportion of farmers also practise water harvesting. Farmers are harvesting water from rooftops and diverting water from natural springs into tanks. This ensures that they have a substantial amount of water stored up. In case of a drought the stored water will be able to sustain them for about five months depending on the volume of the tank (Shumba, 2001). The water is also used for supplementary irrigation of vegetables and crops. In addition, some farmers were digging infiltration pits along contours. Water collects in the pits during the rainy period. When the weather becomes dry, as in the case of early stoppage of rains, the water spreads underground, and is used by the plants. Crops can grow up to maturity by using this conserved moisture. The farmers in Nyanga and Chivi indicated that even if there were only five days of rain in the whole rainy season, the crops would reach maturity using conserved and harvested water in the pits (Shumba, 2001).

It was also noted that some households had a specific granary stocked with grain (sorghum, millets, and maize for a shorter period of time), especially those resistant to post harvest pests. This granary was kept untouched and out of bounds for children (Shumba, 2001). Only the head of the household was allowed into it. Some households were slowly discarding the idea of growing maize as the main crop. They were shifting to the use of traditional crops for example small grains, that it, millets, sorghums.

These crops are drought resistant and therefore give a good yield even with very little rain. Farmers are also looking for indigenous maize varieties (i.e. Kalahari) that are short season, high yielding, drought tolerant and post-harvest pest resistant. An indigenous finger millet variety, *chiraufe*, is also planted in drought years. *Nyamunhororo*, a cucurbit, is popular as the small pumpkin ripens fast and saves people from possible starvation. It is not only drought resistant, but can survive in poor soils. The early maturing cowpea variety *Vigna unguiculata* is also planted in drought seasons.

Models developed by Watts (1983) and USAID (1999) on vulnerability assessments sum up findings reported by a numerous researchers. Coping strategies by individuals or households are influenced by endowments in terms of resources or lack of them. Figure 4.4 shows the relation between the vulnerability level and coping strategies of households in response to shocks and hazards such as drought.

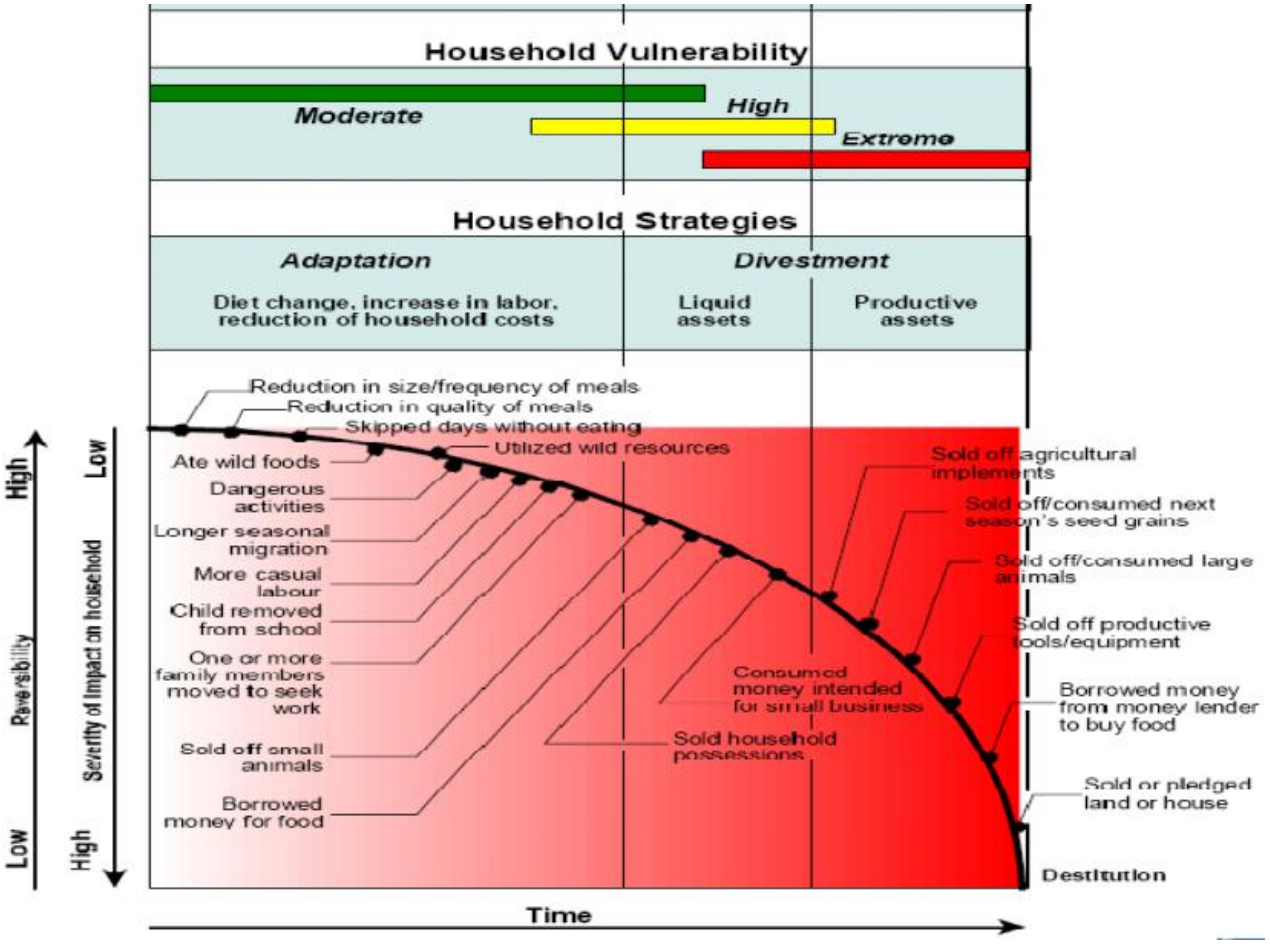

Figure 4.4: Household responses to food security emergencies (after Waats, 1983)
Source: FEWS, 2009

As reflected in Figure 4.4 studies of strategies to cope with food shortages or drought show that these strategies are adopted in identifiable sequences (FEWS, 1999, USAID, 1999). In the initial phases of difficulty, available resources such as savings, labour and wild foods are used by households. As the situation intensifies, recourse is sought in broader social and economic interactions such as loans and gifts from the extended family, sale of small stock, and male labour migration. Finally, sale of productive assets such as land and implements may occur and, since this reduces the capacity of the family to re-establish itself after the shortage is over, emigration, representing abandonment of agriculture, occurs. The trajectory of this sequence of coping strategies can change based on variables such as economic status, gender, and age (Zinyama, Campbell & Matiza, 1988).

Additionally, as villages have become tied to colonial and post colonial administrations, coping strategies including recourse to the wider economy governments have increasingly taken on the role of providing food during national food emergencies, while migration in search of wages has also increased (Zinyama, Campbell & Matiza, 1988; FEWS, 1999). Still,

traditional household coping strategies continue to be of importance (FEWS, 1999; USAID, 1999).These traditional strategies have environmental, economic and social components. Environmentally based strategies include ecological diversification (vlei and stream bank cultivation), gathering of wild fruits, hunting and fishing, strict control of access to water and pasture, and in case of herders, mobility. Economic strategies to cope with food shortages include increased trade, production of crafts, brewing beer for sale, sale of livestock and household effects, growing drought-resistant crops, storage of foods, and, finally, migration. Social strategies include the increased borrowing of food through extended family links, prayer to rainmakers, raiding, sharing, reducing meals, splitting herds, arranging marriages, begging and finally stealing (Zinyama, Campbell & Matiza, 1988; Wisner, *et al.*, 2004).

Households are impacted differently by the same coping strategies (Hutchinson, 1992). The resiliency or the ability of any group or household to recover from adverse change is a function of several factors as shown in Figure 4.5. It is determined by the range of options available to exploit. For example, if the household is situated near a major urban centre or where there is viable commercial agriculture, opportunities for outside employment stand to be high (Zinyama, Campbell & Matiza, 1988; Hutchinson, 1992; USAID, 1999). Again, if the household is located close to a busy road on its own, this scenario stands to facilitate movement to distant areas where more alternatives exist for income generation.

Another factor that conditions the ability of a group or household to cope is the level of resources upon which the group or household can draw. The comparison between different households is illustrated in Figure 4.5 (Hutchinson, 1992; FEWS, 1999). This graph clearly demonstrates the following scenarios: Firstly, households with different endowment levels will cross critical thresholds at different times. Secondly, some comparatively better resourced households may actually increase their resource base during emergencies by way of purchasing of assets through exploiting those already in distress disposal of assets especially from households constituting the of lower economic classes. Thirdly, different households may belong to different social networks that work favourably in terms of resource access. It may come in the form of kinship to a well resourced and extended family, clan or tribal group that remains cohesive and supportive to its members during times of shocks. Fourthly, the same coping strategies may have different impact to different households depending on the resource base of a household. Put differently, disposal of small animals will have no impact on a rich household, but the loss of household resources may substantially increase the vulnerability to food insecurity of a poorer household as it may fail to recharge its stock in future as opportunities arise. Lastly, and not surprisingly, some groups may enjoy access to greater political power or class/caste positions than others, which permits them to

tap other resources at a higher level of political or economic organization (Zinyama, Campbell & Matiza, 1988; Hutchinson, 1992; FEWS; 1999; USAID, 1999).

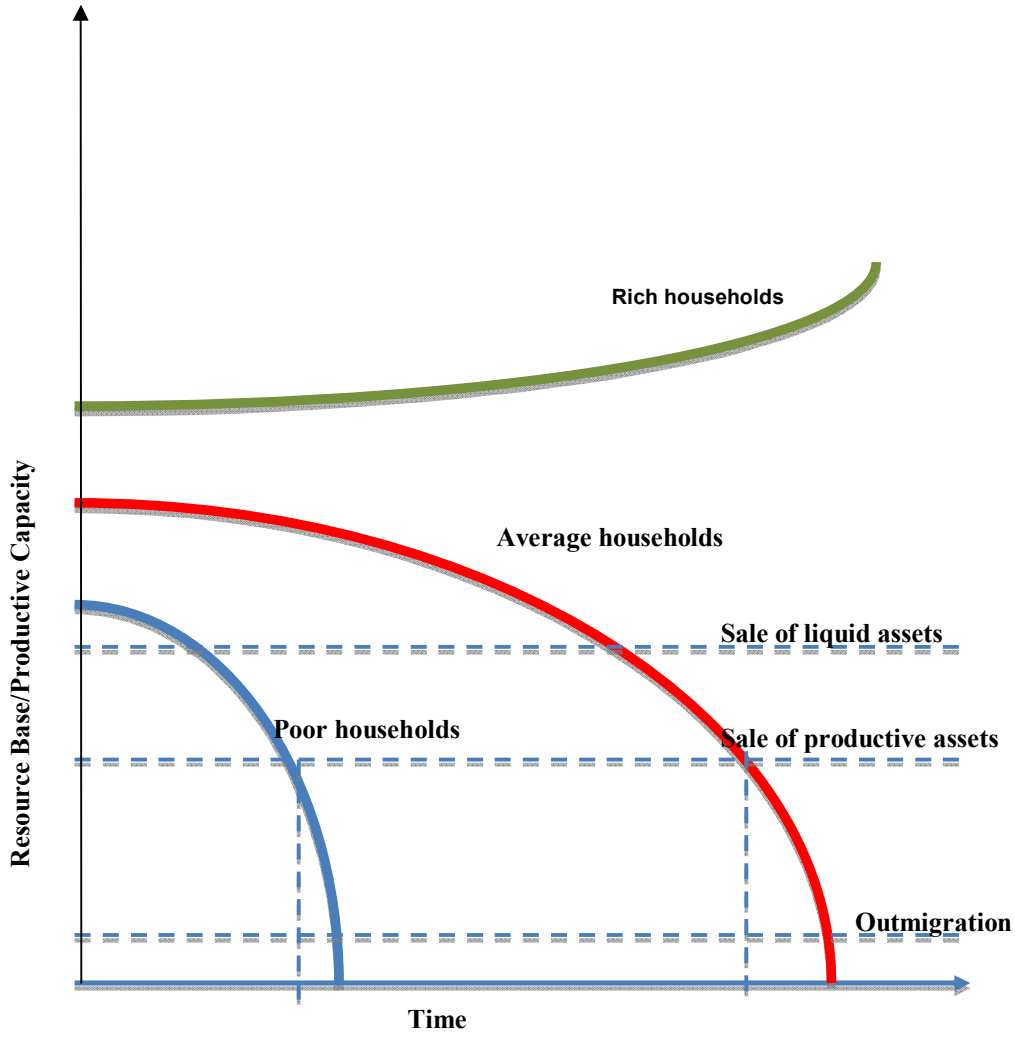

Figure 4.5: Differences between household responses as a function of resource base

Source: adapted from FEWS, 1999 and Jordaan, 2011

In order to reduce the need for expensive governmental feeding programmes and to stop food shortages at the village-level, development efforts should include the objective of strengthening the existing, viable coping strategies and search for new, local ones.(Zinyama, Campbell & Matiza, 1988; Hutchinson, 1992)

4.9 Conclusion

The Civil Protection Act 5 of 1989[9] (Chapter 10:06) is the regulatory framework that guides disaster management in Zimbabwe and is also complemented by other sections of the law. As provided by the Zimbabwe Civil Protection Act it is national policy for civil protection that

[9] The Civil Protection Act was also revised in 2006

every citizen of Zimbabwe should assist where possible to avert or limit the effects of disaster. There are many institutions/organizations that are involved from the national up to grassroots level. While disaster committees exist from national to district level, the same committees are not vibrant at village level if at all. Because drought is a recurrent event, copying strategies are fast improving in the communities. However, some coping strategies may take forms some of which may even be proscribed and discouraged by members of a social group or gender. Literature on coping reflects an identifiable sequence of coping strategies adopted by households. Households start with non erosive to erosive ones as the drought severity intensifies. The following chapter presents findings of the study yet, the discussion of results will be done in Chapter 6.

CHAPTER 5: RESEARCH FINDINGS

5.1. Introduction

Research findings are presented in this chapter. Results are tabulated mostly in graphical form. It gives an insight into the coping mechanisms practised by the households and communities in Mutasa district. The role of institutions in drought management is also unpacked. Note that the discussion of the results has been reserved for the next chapter.

5.2. Household Details

The study was conducted in mid July 2011 and consisted of 164 households. There were more male headed households in the study compared to female headed households (Figure 5.1). Of the households studied, 109 were males while 55 were female headed households at 66% and 34% respectively.

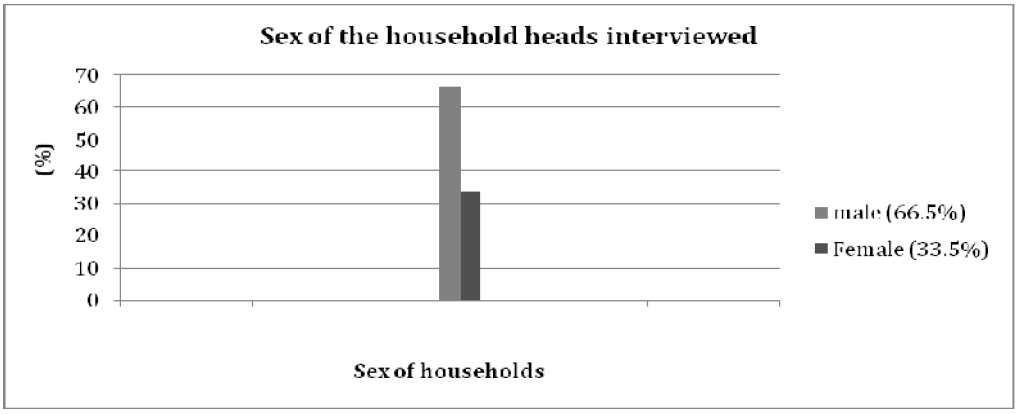

Figure 5.1: Sex of household heads interviewed in percentages

The majority of the respondents were in the 46 to 60 age group and constituted 39%, followed by age range 31- 45 at 34%, those more than 60 years at 17% with the least dominant group in the 18-24 category at only 2.4% as reflected in Table 5.1.

TABLE 5.1: AGE OF RESPONDENTS

Age range	Frequency	Percent	Cumulative Percent
18-24	4	2.4	2.4
25-30	12	7.3	9.8
31-45	56	34.1	43.9
46-60	64	39.0	82.9
more than 60	28	17.1	100.0
Total	164	100.0	

There were more married households in the community than the single, divorced or widowed (Table 5.2). The married constituted 70%, followed by the widowed at 27% with the singles which were equal in numbers to the divorcees at 3%.

TABLE 5.2: MARITAL STATUS OF HOUSEHOLD HEAD

Marital status	Frequency	Per cent (%)
single	3	1.8
married	114	69.5
divorced	3	1.8
widowed	44	26.8
Total	164	100.

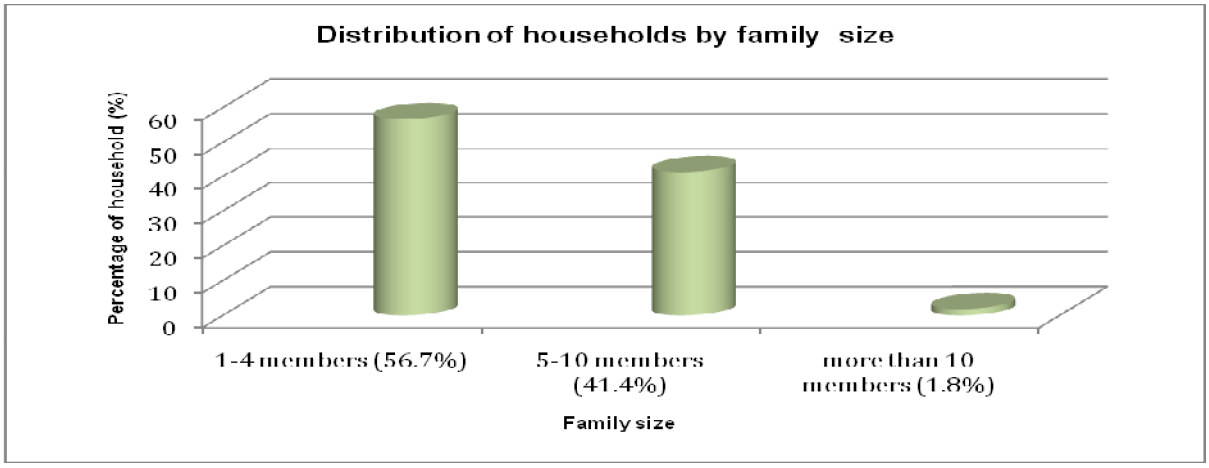

Figure 5.2: Family size

As illustrated in Figure 5.2, the majority of households (57%) in the area had small family sizes which ranged predominantly between one to four members in the family, 41% of households were in the range of five to ten members and only two per cent had family members that exceeded ten people per household.

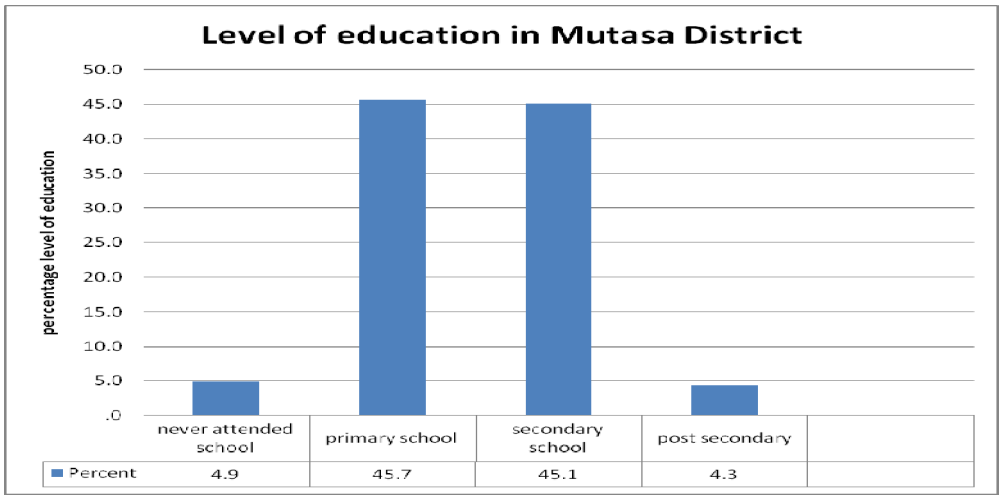

Figure 5.3: Level of education

Mutasa is generally a literate community as demonstrated in Figure 5.3. Only five per cent of the community never attended school, while 95% had at least been to primary school. Of the community 46% had been to primary school, 45% to secondary school while four per cent attempted post secondary level of education. The statistics above is for the household heads only, and does not include children.

5.3. Agricultural production

TABLE 5.3: THE HECTARAGE PLANTED EVERY SEASON

Hactares		Frequency	Percent	Cumulative Percent
	0.4	8	4.9	4.9
	0.5	28	17.1	22.0
	0.6	16	9.8	31.7
	0.7	9	5.5	37.2
	0.8	16	9.8	47.0
	0.9	2	1.2	48.2
	1	44	26.8	75.0
	1.2	4	2.4	77.4
	1.3	1	.6	78.0
	1.4	1	.6	78.7
	1.5	14	8.5	87.2
	2	12	7.3	94.5
	2.5	2	1.2	95.7
	3	6	3.7	99.4
	3.5	1	.6	100.0
	Total	**164**	**100.0**	

Meanwhile the study noted that all households as shown in Table 5.3 had access to land in line with evaluations by Plan (2009). However, the size of cultivated land varied among individual households. The minimum size of land cultivated started at 0.4ha to 3.5ha as the maximum. The majority of households (70.1%) on average cultivated between 0.5ha to 1.0ha. There was no major correlation exhibited between sex and area cultivated as 76% males and 74% of women cultivated 1ha of land and below. The two per cent difference is very negligible.

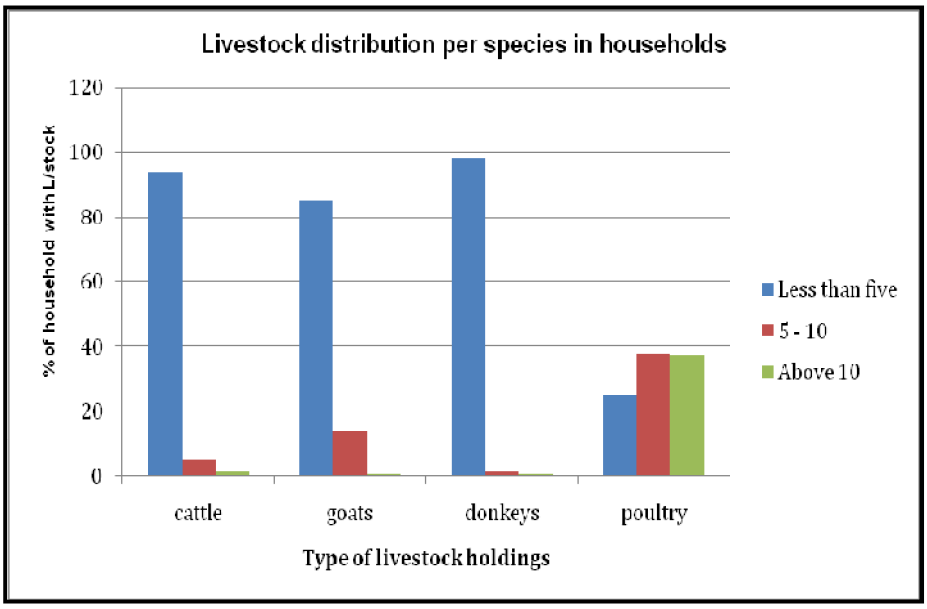

Figure 5.4: Percentage of livestock holdings per household

As reflected in the bar graph in Figure 5.4, households in Mutasa engaged in mixed farming of both dry-land cropping and livestock production which concurred with reports by Scoones (1992). However, the study showed that most of the households owned a few number of cattle, donkeys and goats, if any. Of them 94% owned fewer than five cattle, 85% fewer than five goats while 98% owned fewer than five donkeys. Poultry was the most predominant livestock in the district owned by almost every household with 77% of households keeping at least five chickens.

Farmers who were exposed to drought normally became risk averse and tended to employ risk reduction strategies (Chinembiri, 1999; Shumba, 2001; Dercon, 2002; Wisner, *et al.,* 2004). As observed in the study (Figure 5.5), all households employed some risk mitigation measures to do with agricultural production, given that most of them depended on own production as a food source despite the fact that the yearly yield had not been adequate to take them through to the next season. Farmers tended to change the seed variety in response to drought in preference to drought tolerant varieties. In addition, some increased hectarage of drought resistant crops, staggered planting dates to manage the risk of dry spells, yet some even changed the farming method. Figure 5.5 illustrates the behaviour of the farmers as risk reduction.

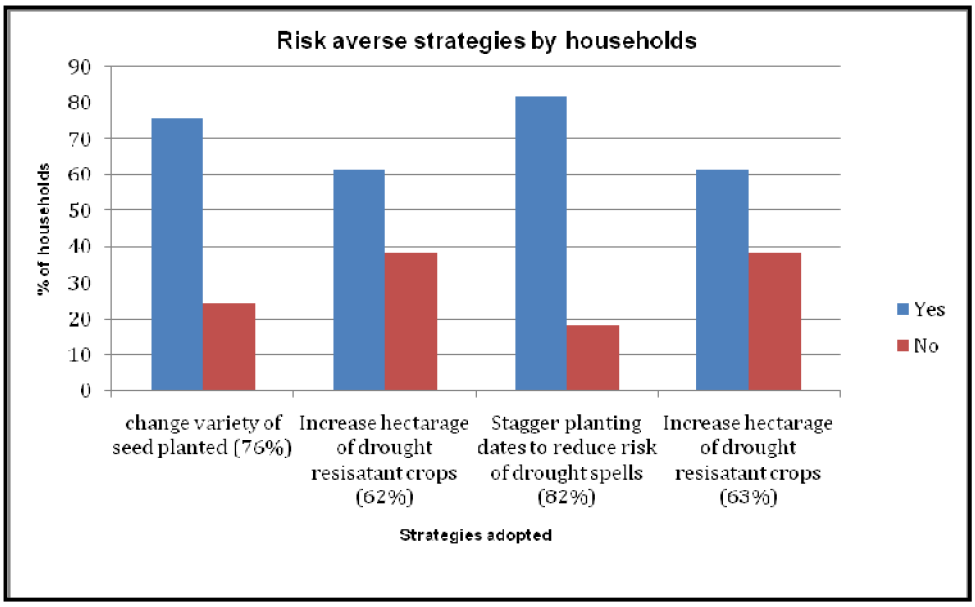

Figure 5.5: Measures taken by farmers in anticipation of drought

As shown in Figure 5.5, the majority of farmers would adopt at least one of the methods, as 76% of the farmers indicated that they changed the variety of seed planted and 62% shared that they increased the hectarage of drought resistant crops. Most of the farmers (82%) staggered the planting dates of their crops, while 63% would change the farming method to that which was water conservative such as the use of basins or zero tillage.

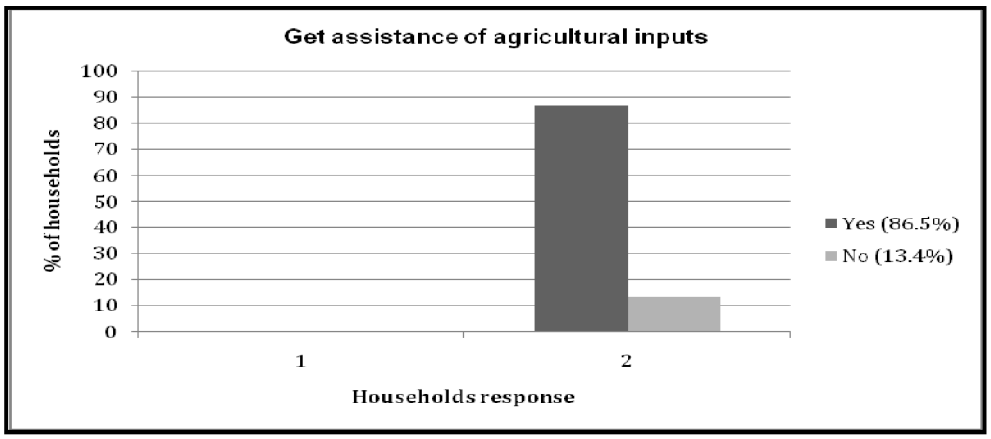

Figure 5.6: Agricultural inputs assistance to households

Besides their own initiatives regarding agricultural production in terms of risk reduction, 87% of the households received assistance in the form of inputs from institutions in the district such as Government programs, NGOs or through other social networks. Government input supported programmes were in the form of subsidized inputs from GMB, Presidential input support programme and *Maguta*.

5.4. Food and income sources

While the district was drought prone, the majority of households (63%) still depended on own agricultural production as the main source of food. Yet, casual labour and food aid were the other most predominant sources of food as shown on Table 5.4. Only a few households, one per cent, depended on barter trade. Remittances at five per cent also contributed to food source as noted from the study. Results on remittances concurred with work done by Dercon (2002) and Bradshaw (2004) that following a disaster as had been the tendency worldwide, many male heads of households migrate resulting in an increase in the number of female headed households. The intention was to seek work and send remittances to the family, even when they did not subsequently do so (Bradshaw, 2004). Again as illustrated in Table 5.5, peasant farming at 46% and casual labour at 29% were the major sources of income in the community. Formal employment (14%) also contributed meaningfully as an income source.

TABLE 5.4: MAJOR SOURCE OF FOOD IN THE PAST FIVE YEARS

Major source of food	Frequency	Percent
Own production	104	63.41
Buy from shops	8	4.88
Remittances	9	5.49
Through barter/exchange	2	1.22
Food aid	19	11.59
Casual labour	22	13.41
Total	164	100

TABLE 5.5: MAJOR SOURCE OF INCOME IN THE PAST FIVE YEARS

Major source of Income	Frequency	Percent
Formal employment	23	14.02
Peasant farming	78	47.56
remittances	13	7.93
Casual labour	47	28.66
Petty trading	3	1.829
Total	164	100

The major source of employment in the district was the forest and timber plantations and the related sawmills dotted around the district. Mines and irrigation schemes provided opportunities for casual labour.

TABLE 5.6: NUMBER OF YEARS HARVESTED BELOW EXPECTATION

Years	Frequency	Percent
All the years	12	7.32
4 out of 5 years	16	9.76
3 out of 5 years	50	30.49
2 out of 5 years	49	29.88
1 out of 5 years	32	19.51
Good harvest in all the years	5	3.05
Total	**164**	**100**

For the past decade, Mutasa had been hard hit by recurrent droughts just like most other districts in the country (ZimVAC, 2009). Table 5.6 shows that for the past five years, most households harvested below their expectations. The majority of the households (30%) interviewed harvested for three out of five years below their expectations, another 29.88% indicated that two out of five years had been bad, 9.76% performed badly in four out of the five years while seven per cent never harvested meaningfully during the five year period. Only three per cent of the households had not been affected by drought.

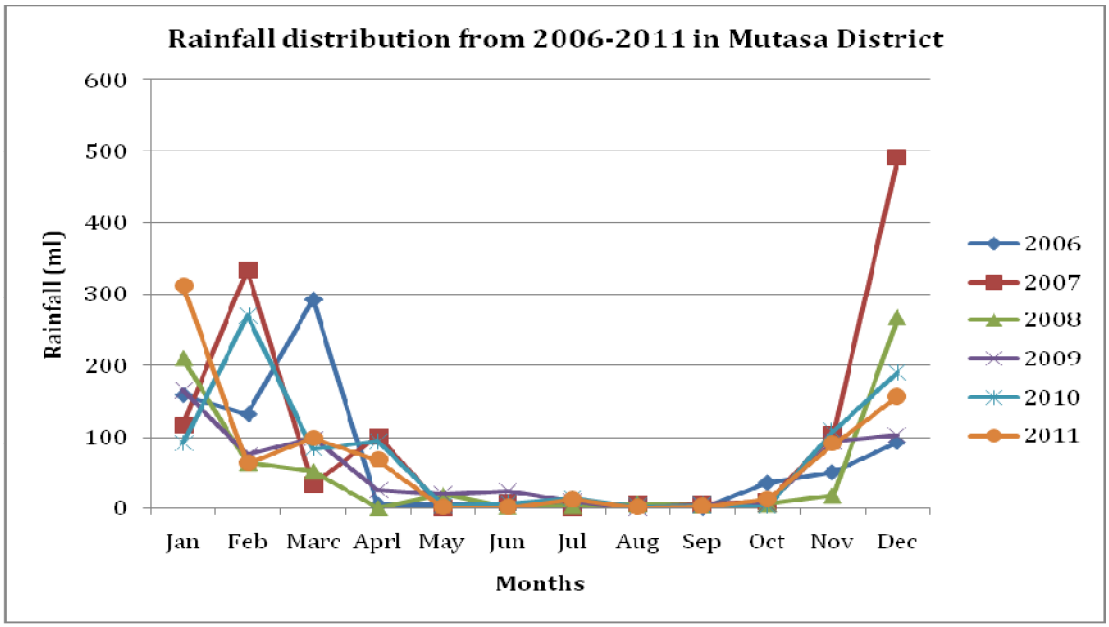

Figure 5.7: Rainfall pattern for Mutasa district from year 2006 to 2011

Source: Rainfall figures taken from Mutasa weather station (2011)

Figure 5.7 and Annexure E reflects the rainfall distribution pattern in the district from 2006-2011. As argued by the department of Metrological Services, the amount of rainfall had not significantly changed from one year to another, but what had changed was the rainfall distribution pattern. Some years were characterized by dry spells between November and

April when crops were on the field leading to moisture stress and ultimately crop failure. Some dry spells had been very long, such that rains only came back when crops were beyond the permanent wilting point[10] resulting in drought.

While some farmers had been affected by drought in all the five years as reflected in Table 5.6, not all years have been bad. Some years were more severe in terms of drought than others as illustrated in Figure 5.8. The 2007/8 season was the most severe drought year (49.39% of the households interviewed) and the 2005/6 featured as the least severe (4.88% of households). It means that despite all years being relatively dry (leading to drought), some years are worse off than others.

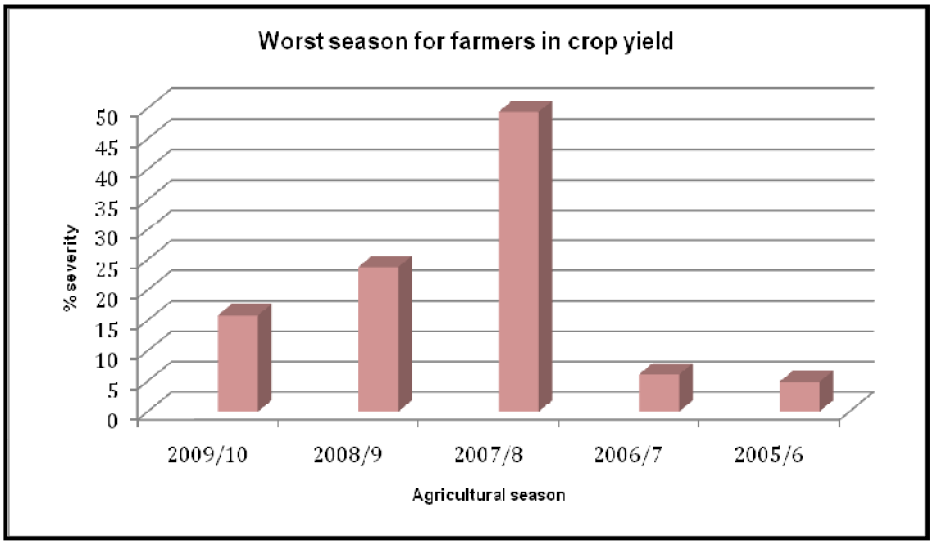

Figure 5.8: Drought severity during the past five year period

5.5. Coping strategies

Coping mechanisms for drought refers to the strategy applied by individuals, families, communities, institutions, firms and society at large or governments to cope with the negative effects of a drought (Dercon, 2002). Households in the district employed a number of strategies to cope with drought. During times of adversity, some households resorted to skip some of the meals, reduce size of the food portion, go the whole day without food, eat unusual wild fruits, vegetables and other foods, adults skipped meals so that children could eat, ate premature crops, borrowed from neighbours and yet some provided labour in return for food.

[10] Permanent wilting point ï It is a physiological condition of a plant where the plant has wilted due to moisture stress such that even when supplied with water the plant can no longer recover.

Meanwhile it was also observed that some households would actually send some members of the household to other relatives to sell livestock and dispose some household assets. These findings are in line with observations made by Hutschinson (1992), FEWS (1999), Dercon (2002), Plan (2009), ZimVAC (2009) and Ndlovu (2010). However, in the study, the most predominant coping strategies employed by households were to reduce the food portion daily (53.7%), skip some meals daily (51.8%) and the selling of livestock (51.8%) while disposal of household assets and the sending of other members of the household to other relatives were shown as the least. The most commonly sold livestock was chicken and goats. Hutschinson (1992) argues that coping may not proceed sequentially along a singular trajectory, but that households might pursue several strategies in parralel (Figure 4.4).

5.6 Institutional capacity

Various institutions were involved in drought management in the district. Those included government departments, CBOs/NGOs/INGOs, local leadership and the community, social networks that included friends and relatives and some religious organisations in the form of churches. Government departments physically presented, according to what their realities were, the GMB, Social Welfare and Agritex. However, not much support had been coming from government institutions as compared to NGOs (Figure 5.9).

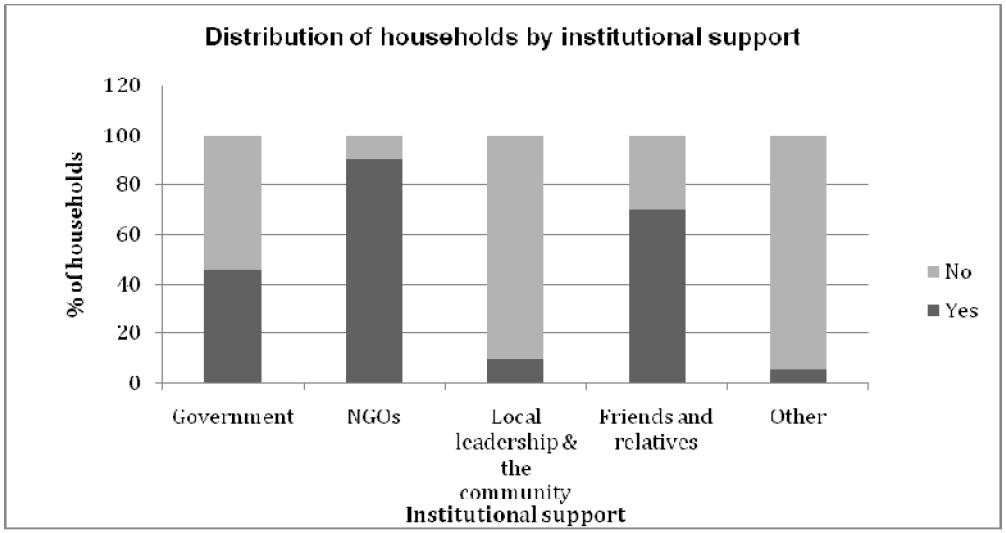

Figure 5.9: Householdsôresponses to institutions which are there for support during drought

As illustrated in Figure 5.9, there was a general feeling that there was no adequate support or assistance that came from local leadership and the community, and there was limited support that came from other sources such as churches during the period of drought. The work also established that NGOs and social networks in the form of friends and relatives were the most acknowledged sources of support in the district in coping with drought.

Households received food assistance from those social networks while NGOs came in with food hand-outs, inputs and soft ware packages in the form of training and capacity building of communities (personal communication). Findings here compare very well with work reported by Ndlovu (2010) on the trend of support from stakeholders and other role players. Ndlovu notes that informal institutions have not played a major role in drought risk reduction. Their role (e.g. chieftainship) has only been limited to food distribution activities. The private sector is not very visible in drought management, only NGOs are involved in different aspects of drought risk reduction; many offering short-term assistance (relief services) that satisfies immediate needs. Some also provide technical assistance and financial/material support for initiatives that help communities in rebuilding their livelihoods (Ndlovu, 2010).

While farmers demonstrated measures of risk averse in their individual rights, the work established that most of the households (64.63%) were not involved in drought risk reduction projects in the community as reflected in Table 5.7. A few (35.37%) were involved in community programmes such as food for assets where community members worked on building assets in their communities to improve their livelihood profiles in exchange for food. Some of the structures that had been built or rehabilitated were dip tanks, water sources and irrigation schemes.

TABLE 5.7: HOUSEHOLDS' DROUGHT MITIGATION INVOLVEMENT IN THE COMMUNITY

Have you ever been involved in drought mitigation programs in your community?	Frequency	Percent
Yes	58	35.37
No	106	64.63
Total	164	100

5.7 Conclusion

The majority of households attended school up to primary level and most households had an average family size ranging from one to four members. Households practised mixed faming, but with low livestock holding per household. Coping strategies adopted included changing variety of seed cultivated, increasing hectarage of drought resistant crops, staggering planting dates and changing methods of farming. The major source of food remained own production and income was mainly derived from peasant farming. A wide range of institutions played a pivotal role in drought mitigation, however, NGOs were the most active group while local leadership was the least helpful in that same regard. While all the years from 2005 to 2010 were characterized by dry spells that led to food deficit, the 2007/8 season was the worst season in terms of drought.

CHAPTER 6: RESULTS DISCUSSION

6.1. Introduction

In this chapter an analysis of findings is done. Results are discussed and further compared to literature and research results from other scholars. Interestingly, results compare well with other published literature. Results further confirm the hypothesis made by the researcher that the community has developed copying strategies to manage drought.

6.2 Household details

The study noted that all households (Table 5.1) had access to land although the size of cultivated land varied among individual households. Since the majority of (57%) had small family sizes, labour could be a limiting factor in agricultural production. However, the community has strength in literacy levels (Figure 5.3). Education is a vital vehicle for access to information and technology. It is paramount to development as it enables people to acquire knowledge and skills to make informed decisions about their social, economic and political situations. Literacy level in this study was considered a proxy to enhanced capacity of people to make rational decisions on agricultural and non agricultural development as well as assimilate knowledge and skills to improve their livelihoods.

6.3 Basic livelihood practices

Livelihoods in Mutasa district are mostly agro based and the major source of food is own production through agricultural activities, food aid and casual labour while their income sources are mainly peasant farming and casual labour. Given the agro-centrality of their livelihoods in an environment that is drought prone, the households are therefore vulnerable to the erratic weather pattern obtaining in the district. Andear (2009) reports that about 70% of Zimbabwe's population derives its livelihood from subsistence agriculture and other rural activities, but these livelihoods are threatened by climate change. The agriculture sector's reliance on seasonal, rain-fed cultivation makes the sector particularly vulnerable to climate variability and change (Andear, 2009). While the amount of rainfall in any given year in the decade may not have changed *per se*, it is the erratic rainfall distribution that has led to agricultural drought.

The study also revealed an interesting scenario on household demographics. As illustrated in Figure 5.5, the majority of households (57%) have few family members ranging from one to four members. Limiting labour could also affect agricultural production. It was noted in the study that migration was one coping strategy employed by households in adversity, which was in line with work by Bradshaw (2004) who indicated that in adversity the economic active

age group and male head of households migrate resulting in an increase in the number of female headed households.

The severity of drought had been worsened by the shortage of draft power. The study revealed that the majority of households increased hectarage of drought resistant crops in anticipation to drought (Figure 5.5) yet the majority of households (56.7%) had an average household size of one to four members as shown in Figure 5.2. Migration, due to the economic decline and the devastating impact of HIV and Aids on the most economically active age group, has robbed farmers of the much needed household labour. Assuming the community is also affected by HIV as are other communities in Zimbabwe, the impact of HIV, itself a ñcreeping emergencyò has progressively contributed to the severity of droughts. Poorly managed responses to HIV/AIDS have contributed to vulnerability at household level. In this context there is increasing awareness that the typical humanitarian response of providing food aid will not solve this problem because the underlying causes of HIV/Aids pandemic do not make these droughts normal ones. There is no end to it because people are too weak to plant, cultivate their lands and even harvest, so this challenge may not go away with improved weather (Holloway, 2003).

Meanwhile, the study demonstrated a high degree of risk averseness among the farmers. Figure 5.6 showed that farmers in the district employed various risk mitigation and coping strategies. Farmers developed a number of strategies ranging from varying the seed variety ï taking up maize resistant cultivars, increasing hectarage of the drought resistant crops, intercropping, and stagger planting dates, and apply conservation agriculture to mixed farming of crops and livestock.

These strategies compare well with findings by numerous development practitioners and researchers. Amani and Maro (1991) argue that to improve food security in food deficit areas, the production of drought resistant crops such as sorghum and millet needs to be encouraged. This strategy must be combined with a strategy to increase household income through off farm employment and production of high value crops. Although sorghum and millet are more drought resistant, improved maize production technologies offer higher returns, so advice to grow unimproved millet and sorghum has threatened the credibility of extension workers. Thus initiatives to promote sorghum and millet cannot be based solely on food security objectives, but must arise out of the recognition of these crops as industrially important. Maize preference is a result of government support in terms of research, extension, credits, markets, infrastructure and processing of this crop at national level due to urban and industrial demands for maize (Rorhbach & Mwila, 1992).

The study also established that farmers changed seed variety in preparation for drought. 87% of the farmers got the seed through programmes running in the district. The seed was not readily available and when available, it was way above the reach of many farmers because it was very expensive. Seed was normally supplied for free by donor agencies or at subsidized rate by a lot of government supported inputs programmes. These included the GMB (a parastatal) which provided maize seed and fertilizer to farmers during the 2010/2011 agricultural season at US$5.00/10kg and US$7.00/50kg compared to market rates of US$22.00/10kg and US$30.00/50kg respectively. There have been other programmes such as *Maguta* and the Presidential input support programmes all intended to assist the farmer in terms of access to inputs (personal comms.). Regrettably, the supply of inputs were done very late, way past the recommended planting period[11] for the crop due to planning, lack of it or both in addition to limited seed varieties. At times, the distribution was marred by political controversy with those who had higher political offices/muscle looting most of the inputs at the expense of the general populace (personal comms.) Farmers had to choose from what was available and mostly maize had been the seed of choice in government led programmes. NGOs were very active in the supply of agricultural inputs in the district either through physical distribution or the voucher and seed fair approach. NGOs such as Africare, Plan International and GTZ were mentioned as the most active in this regard. However, the biggest challenge was the sustainability of these inputs in the long run, especially from NGOs.

As observed by Dercon (2002), diversification of production is regarded as one most important risk-averse strategy with the farming people. Usually their production involves mixed cropping, intercropping, the cultivation on non-staple root crops and use of kitchen gardens. This strategy provides a surplus in good years since it is normally planned on the basis of meeting subsistence needs in bad years (Wisner, *et al.,* 2004). It must be noticed that diversifying production makes use of environmental variations and provides the best chance of an optimum yield under all variations of weather and plant pests.

The study revealed that farmers owned livestock, which were a source of income during drought. When livestock were impacted by drought, the resulting depression in productivity in rural areas dependent on animals for traction, nutrition and revenues, lasted well beyond the term of the drought itself (Blackburn*, et al.,* 1993). Livestock were sold to middlemen or local butcheries in times of stress to smoothen food consumption patterns, but the majority owned

[11] Recommended planting period for maize in the district is between November to mid January

mainly poultry, and with a few who owned cattle. However, a relatively large proportion of households often did not own any. This practice was in line with observations by Dercon (2002) who established that only half the households in a sample in Western Tanzania owned cattle, even though cattle were important in the farming system and for other traditional reasons.

The major sources of food as reflected in the study are own production, casual labour and food aid. Actually the majority of households depend on farm activity to produce food in an environment that is faced with erratic rainfall pattern that has in turn led to recurrent droughts. The dependency of the majority on own production makes the community more vulnerable to droughts because their livelihoods by nature of being reliant on rain fed agriculture will remain fragile. It was established that casual labour while being a positive source of both food and income, it had mainly been employed as a coping mechanism following crop failure. Yet food aid only benefited a few categories of people based on officialsô perception of vulnerability, and was not sustainable.

6.4. Household coping strategies

Literature on coping with drought reflects that individual householdsô coping mechanisms follow an identifiable sequence as confirmed by the model developed by Watts in 1983 and later modified by other scholars (FEWS, 1999).

From the focused group discussions held, it came out strongly backed by literature that strategies to cope with food shortages or drought were adopted in an identifiable sequence. In the initial phases of difficulty, tendency to reduce meal portion, skip some meals, adults skip meals so children can eat, eating of wild fruits and immature crops, go the whole day without food, sale of labour and use of available resources such as savings, were the most common. As the situation intensified, resource was sought in broader social and economic interactions such as sending some members of the family to other relatives, cross border trading, sale of small stock; barter exchange and even begging were established. Finally, sale of productive assets, such as large stock, implements and non productive but difficult to replace assets, such as valuable roofing material in the form of asbestos sheets occur. Since this reduces the capacity of the family to re-establish itself after the shortage was over, emigration of the male labour and the economically active age group occurred and in turn reduced labour for agriculture in the following season (Hutchinson, 1992; USAID, 1999). The trajectory of this sequence of coping strategies starts with non erosive ones to erosive ones that make households more vulnerable to feature droughts (FEWS, 1999).

However, not all households are affected in a similar fashion. FDGs revealed that some households with social network connections or access to resources during this period vastly accumulate assets during this period. The most cited group is community based livestock middlemen. This is confirmed in reports by Decorn (2002) that during drought, prices of livestock normally go down whilst that of maize or grain goes up. So as the situation intensifies, there is barter trade of livestock for grain and those with grain take advantage of depressed livestock prices to accumulate wealth yet those disposing livestock under distress get peanuts. This is also reported elsewhere by FEWS (1999) as shown in Figure 4.5. This response to coping strategies is a function of the individual resource base. Meanwhile, the poorer following disposal of their assets, fail to recover in future even when better weather conditions or opportunities come up, and so suffer the most from recurrent droughts.

6.5. Institutional capacity

Households and relevant stakeholders interviewed indicated a number of institutions that were involved in drought management in the sense of either risk reduction, response or both. Institutions available, range from Government departments, NGOs, local leadership and the community, friends and relatives and other local institutions in the form of churches. Table 6.1 shows names of the respective institutions found to be active in the district.

TABLE 6.1: INSTITUTIONS AND ROLES PERCEIVED BY HOUSEHOLDS AND STAKEHOLDERS

Category of institutions	Name of institutions	Summary of activities
Government departments	AGRITEX, DVS, LPD, DSS	Capacity building of farmers, technical extension, dissemination of weather and market information, involved in food distribution and beneficiary selection
Quasi-government/ parastatals	GMB, ZFU, ZimVAC	Distribution of government grain and inputs, subsidized small stock and respective vaccines, vulnerability assessment
NGOs	Plan international, World Vision, WFP, Africare	Food aid distribution, food security projects such as small stock pass-on schemes, income generating projects, irrigation schemes, and farmersô capacity building through workshops.
Local leadership	Chief, Headmen, village heads, councillors	Mostly active in aid distribution, selection of target areas as well as beneficiaries. In charge of community managed granaries (Isiphala seNkosi/Zunde raMambo)
Social networks	Friends and relatives	Gifts in cash and kind, linked to resources and mostly those with relatives in power get priority in community resources distribution
Others	Churches, religious groups	Assist in cash and kind to the most vulnerable such as orphans and child headed families.

6.5.1. Roles and challenges of government departments

The study established that government agencies had the mandate to work with farmers on agricultural extension services. The departments such as the Department of Social Services and RDC coordinated other players that worked with these households from registration to work within the district, introducing them to communities and joint implementation, monitoring and evaluation of activities. Departments in the Ministry of Agriculture such as Agritex, DVS and LPD mostly did the extension work.

Extension work entails the training of farmers, demonstrating appropriate agricultural practices, knowledge sharing and latest technology testing and dissemination. Major challenges observed with these departments are shortage of resources such as transport and other consumables for farmer training (Ndlovu, 2010). The situation is exacerbated by shortage of experienced extension workers due to high staff turnover, which has led to the high extension worker farmer ratio which stands at 1:600. Most of the extension personnel have left the department due to poor remuneration, and those remaining behind are mostly demotivated to execute their duties (WFP-Plan, 2009).

6.5.2. Roles and challenges of Quasi-government/parastatals

These are seen to play a major role in farmer coordination and formation of farmer field schools particularly from farmer unions (ZFU & ZCFU). The farmersô unions have mostly registered farmers to get subsidized inputs such as seed, fertilizer and animal vaccinations. However, of late, farmersôunions lack one voice for advocacy and policy, because they have become many hence fight for space, so this result in confusion to the farmers. In addition, these institutions are not always available on ground and only appear towards the beginning of agricultural seasons to collect farmer subscription fees (personal communication).

The GMB serves as the national strategic grain reserve. Mostly inputs and grain from government coffers are stored and distributed though the parastatal at highly subsidized rates. While GMB has played a strategic role in grain storage and subsequent distribution in times of adversity many a time, GMB is not well resourced to buy all the produce from farmers who produce in excess. This is also confirmed by FAO reports of 2004. Even when the produce is delivered to GMB, payment to producers has taken too long at times stretching for months. GMB has in turn lost most of the market share to private traders following liberalization of the market.

GMB used to enjoy the monopoly to buy grain until the market was liberalized then started to face competitors in the form of private traders who offered cash at collection of produce at

the farmersôdoor steps. In addition, when food was finally distributed by GMB, transport and logistics, delayed supplies and identification of beneficiaries took long so that the targeted people were already starving by the time food was distributed.

6.5.3. Roles and challenges of Non Governmental Organisations

NGOsôwork in Mutasa has been complementary to Government efforts. The Government of Zimbabwe remains the duty bearer in disasters even though every legal persona is mandated to respond in disasters according to the Civil Protection Act (Zambia, 1989).. The study found that NGOs were involved in various community projects that addressed risk reduction and response to disasters. In risk reduction and preparedness, NGOs such as Plan International and World Vision were found to be constructing and rehabilitating irrigation schemes in the district to address the perennial water challenges from rain-fed agriculture. They facilitated seed availability to communities through organizing agricultural inputs and technology fairs. Some livestock pass on schemes[12] were also conducted by the same NGOs as a way of building drought resilience in the community. Livestock were seen as a source of income when the drought situation intensified.

Farmers were being trained on best agronomic practices, conservation and livestock management skills that fitted well with the drought prone areas. Plan International in particular, had established viable village saving and lending schemes (VS&L) for credit and income access to the rural households in the district (see Annexure D). Some projects included food for assets programmes where the communities created assets in return for food. Common assets created by communities were dip tanks, dams, roads that linked them to markets and schools for human capital development. Drought response programmes were also noted in the study as vulnerable group feeding (VGF), food handouts to people living with HIV/AIDS and the aged who was labour constrained.

These NGOs were not without challenges as noted during the study. The study confirmed reports by Ndlovu (2010). Most NGOs had a small number of staff, based at district level and not at ward or local level making monitoring of NGO projects weak. Challenges common to both NGOs and Government departments included political interference in day-to-day activities that sometimes derailed implementation of drought risk reduction activities. The situation was also exacerbated by demands of a lot of paper work with RDC that derailed registration and project implementation. The existing economic environment also led to high

[12] A pass-on scheme is an arrangement where beneficiaries of livestock or any other inputs are grouped together and given the livestock/inputs. The livestock/inputs are given to one member of the group who will in turn pass-on the offspring and remains with parental stock or the other way round to the other member until everyone benefits in that group. The system promotes ownership, knowledge sharing and sustainability.

staff turn-over in most government departments and shortages of inputs and materials required for drought risk reduction (personal comms.). The current global economic crisis would further exacerbate the situation as it had already started affecting funding inflows for some NGOs (Ndlovu, 2010).

6.5.4. Roles and challenges of local leadership

Local leaders are the custodians of government and local authority by-laws. They enforce these by-laws at community level and also coordinate the payment of taxes at this level. Local leaders also take care of the local granaries (*Isiphala seNkonsi*) - from field cultivation of crops, harvesting, storage and the subsequent identification of beneficiaries and distribution of the grain. But the study noted that the role of local leadership was mostly limited to the identification of beneficiaries of food aid programmes and the food distribution component. The findings concurred with work by Ndlovu (2010) who earlier reported that informal institutions had not played a major role in drought risk reduction. Their role (e.g. Chieftainship) had only been limited to food distribution activities. Ndlovu (2010) further observed that traditional norms and beliefs were no longer effective in reducing land degradation because law enforcement was now weak. That might continue for some time in future in view of the growing population pressure on the environment.

6.5.5. Roles and challenges of social networks

Households (69.5%) interviewed, acknowledged the assistance they received from friends and relatives. The victims called upon obligations from other family members, kin, patrons, friends, from the general public by appeals to moral duty. Remittances or other assistance came in the form of cash or kind. However, as noted by Dercon (2002), the social safety nets are most likely to benefit those who have resourceful extended families and relatives in political power. It has negative effects on those with poor relatives to assist them, and their impact is at times limited while they may have negative externalities on households not covered by the safety net.

6.5.6. Roles and challenges of churches and other religious groups

In the context of drought, churches played a significant role in providing food baskets to the vulnerable members of the community, including payment of school fees to orphans and other vulnerable children. They provided psycho-social support to some desperate cases. One major challenge with the assistance coming from churches and religious institutions was that it was distributed on discriminatory basis, targeting mostly members that belonged to that congregation or members of the same religious group.

6.6. Disaster management practices

Drought emergencies at district level were coordinated by the DDRC, a committee made up of district level authority and other stakeholders in the livelihoods sector such as the District Administratorôs office (DA), Agricultural extension services (Agritex), Livestock Production department (LPD), Veterinary Services department (DVS), department of Social Services (DSS), the Grain Marketing Board (GMB), the Rural District Council (RDC), NGOs and other relevant stakeholders that may be co-opted in the committee. The committee in liaison with ZimVAC conducted vulnerability assessment and hazard mapping in the district. The DDRC managed relief, decided the targeting criteria in terms of areas and vulnerable groups. The committee also allocated grain from the GMB to respective areas in the district. This committee like its sister committee, the Civil Protection Committee, was well established and domiciled at district level, without well functional corresponding structures at village level where the drought victims and first responders to drought emergencies were found. However, common problems with drought and other natural hazards noted by the study as observed by Wilhite (2000), are maintaining interest in planning beyond the relatively short window of opportunity that follows the event, given the on-again, off-again nature of this phenomenon. Interest in drought planning quickly wanes in the post drought period when precipitation conditions have returned to normal or above normal level. This is evidenced by the reduced number of meetings if any after the drought period (personal communication).

The departments in the Ministry of Agriculture, Mechanisation and Irrigation Development (MAMID), such as Agritex and Livestock Production are involved in the yearly ZimVACôs vulnerability assessments and also conduct their independent crop and livestock assessments. There are also complementary assessments done by the famine early warning network (FEWSNET). All these results are used in triangulation by the National Government to predict the prospects of the season and when a national food deficit is anticipated, mobilization of resources is done to cover for the shortfall.

NGOs as indicated play a pivotal role in capacity building of the rural households through giving support to government departments to conduct famer trainings. Construction of irrigation schemes and rehabilitation of the same in Mutasa district reduces the householdsô vulnerability to drought by way of provision of dependable water sources that allow farmers to cultivate throughout the year without moisture stress worries. However, the number of plot holders in irrigation schemes *vis-a vis* on dry-land farming is insignificant. For example, Plan International constructed a 30ha Makuwaza irrigation which had 60 plot holders and EU constructed a 29 ha Manunure irrigation but that also had only 58 plot holders.

Meanwhile, only 35.37% of household in the study acknowledged their participation in disaster risk reduction programmes in the community, but it would appear more people actually did risk reduction projects subconsciously or unknowingly. Capacity building workshops, livestock pass-on projects, food for assets programmes such as dip tank and irrigation schemes rehabilitation, while facilitated, were not taken as livelihoods disaster proofing. Extension support by extension departments on issues such as conservation farming, crop rotation, destocking, stover harvesting and treatment were not recognized as risk reduction yet, all these were done in the research area.

However, many departments or quasi government institutions such as GMB, DDF, Agritex, Irrigation and division of Livestock and Veterinary Services remained under funded and under resourced (personal communication). Meanwhile, local leadership or informal institutions were only visible during food distribution, but were no longer active at enforcing by-laws on land degradation (Ndlovu, 2010).

6.7. Conclusion

Livelihoods in Mutasa district are agro-based. The dependency of the livelihoods on rain-fed agriculture makes the community vulnerable to climate change, particularly the erratic rainfall pattern. Households have devised a multitude of coping strategies to avert starvation which span from risk mitigation to response. Table 6.1 summarises the role played by institutions to build householdsô resilience to cope with drought. Institutions available in the community, range from local leadership, churches, local authorities, government department, quasi government and parastatals, NGOs, DDRC, Civil Protection Committee and ZimVAC. Challenges of the institutions include lack of funding, staff-turn over, understaffing and lack of interest in drought planning post the drought phase when rainfall normalizes.

CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

7.1. Introduction

In this chapter conclusions are drawn and recommendations made based on the research, discussions and literature reviews of previous chapters. Recommendations are made on some grey areas that were identified by the research, but could not be covered either because they were not within the scope of the study or due to resource constraints.

7.2. Conclusion

About 70% of Zimbabwe's population derives its livelihood from subsistence agriculture and other rural activities, but these livelihoods are threatened by climate change. The agriculture sector's reliance on seasonal, rain-fed cultivation makes the sector particularly vulnerable to climate variability and change (Andear, 2009). Mutasa district is prone to drought. Although drought can result from a number of different causes, one of the most common drought scenarios occurs when crops and livestock suffer from severe moisture stress. This is when available water is less than the physiological needs of the same. In the past five years, almost all have been agricultural droughts. The rainfall pattern has been so erratic and mostly characterized by dry spells such that rain fed agriculture has become unreliable.

Poor rainfall has resulted in rural households failing to harvest any meaningful produce, even those who harvested some grain; it was not enough to see them throughout the season resulting in food insecurity and stress as confirmed by reports from ZimVAC (2009). Most farmers depending on rain-fed agriculture experienced a yield decline, with average yield declining from the expected 4 t/ha to 0.1t/ha. The decline has been exacerbated by shortage of inputs such as fertilizer, appropriate seed varieties, inadequate extension services and timing of planting. In addition, the devastating effects of HIV/Aids estimated at 15.5% and the continuous rural - urban migration or border jumping to neighbouring countries such as Mozambique and South Africa in search of opportunities among the most productive age group posed a challenge to food production.

The majority of communal farmers lost drought power and the high cost of inputs and unavailability of inputs had further compounded the challenges rural households faced. To acquire the necessary inputs they needed to realise better yields (Agricultural Technical & Extension, 2008). Most farmers lacked the requisite knowledge and skills to manage their farming activities as commercial enterprises. The situation was exacerbated by the high extension worker farmer ratio and demotivated staff.

The major source of food was own production and casual labour while income sources were peasant farming, casual labour and formal employment. The livelihoods of the farmers were therefore fragile since their livelihoods which were agro-based faced the threat of drought.

Farmers had, however, employed a number of drought coping strategies in anticipation of, and during the drought period. The households mostly changed the seed variety planted, increased the hectarage of drought resistant crops, staggered planting dates to reduce risk of dry spells, changed farming methods and adopted water conservation techniques. Meanwhile during the drought period, the households had been forced to adopt coping mechanisms in an identifiable sequence, from the least to the most erosive ones.

The study established that households started by reducing size of the food portion, skipped some of the meals, at times went for the whole day without food, were forced to eat unusual wild fruits and vegetables, ate premature crops, borrowed from neighbours and provided labour in return for food. But when the situation deteriorated, mechanisms such as sending some members of the family to other relatives, distress disposal of livestock and other productive household assets and migration were not uncommon.

A wide range of agencies are involved in drought mitigation in the form of government departments, quasi-government institutions, NGOs, local leadership and other community organizations while the private sector has not been active. The limited involvement of the private sector has also been reported by Ndlovu (2010). Agencies have led and implemented a number of risk reduction programmes to increase the communitiesôresilience to drought. Irrigation construction and rehabilitation, dip tanks rehabilitation, livestock pass on schemes, agricultural inputs and market fairs, income generating activities, VS&L schemes and farmer training in various agricultural facets were revealed.

The agencies involved in drought risk reduction have done so with community involvement and participation, a key factor in sustainability of most of these interventions. However, their work has faced a number of obstacles in the form of underfunding, lack of resources, staff turnover and political interference. The non availability of corresponding effective structures or committees such as DDRC and Civil Protection Committees at village/ward level may need to be reviewed.

Disaster management in the country is currently regulated by the Civil Protection Act number 5 (Zambia,1989). This act is being complemented by other sections of the law for synergism and effectiveness. Funding of the Civil Protection Unit under which the act is administered is provided for in annual budgets. However, funding has not been adequate to meet both mitigation plans and emergency response even though there is a provision in the Act for

Treasury to inject additional funding. In order to effectively respond to emergencies, government has had to divert funds that are meant for other developmental projects in other areas. In most cases, NGOs or international agencies such as WFP have come to the rescue of the state in terms of importation and feeding of vulnerable groups while Unicef has also played an important role in the water and sanitation sector by providing water treatment chemicals.

However, due to some shortcomings in the current Act, the country has engaged in a process to review its legislation since 1995 in an effort to strengthen disaster risk reduction. It is anticipated that the process will end with the repeal of the current Civil Protection Act and to be replaced by the Emergency Preparedness and Disaster Management Act which will provide a legal basis for the establishment of an Emergency Preparedness and Disaster Management Authority whose major functions include developing a risk reduction strategy in order to minimize vulnerability to both natural and man-made or technological hazards (MLGPW & UD, 2006).

7.3. Recommendations

The recommendations are derived from responses from interviewees:

a) It is suggested that outside agencies must understand the local coping strategies, otherwise external humanitarian interventions will undermine them, creating aid dependency and all manner of unintended and detrimental outcomes.

b) To design sustainable interventions for a drought prone area, a local and participatory agro ecosystem appraisal is necessary. Further, the most effective interventions will prove to be those that enhance household coping strategies.

c) The communities should not be taken as passive recipients of aid, but could be very resourceful in programme implementation if their views and participation are solicited.

d) Robust committees such as the DDRC and the Civil Protection Committee should be established up to village level where first responders to drought are located.

e) Given the anticipated climatic change that is set to further disrupt the rainfall pattern making rain fed agriculture even more non reliable (Andear, 2009), the scaling up of irrigation infrastructure is called for. Yields achieved on smallholder schemes are higher than rain fed dry-land yields in communal areas. Gross margins for irrigating farmers are significantly greater than for dry-land farmers. As noted by FAO (2000) the effect of irrigation on increasing crop production and incomes is even more marked in the dry winter season, when dry-land production is impossible because of lack of rain.

f) There is urgent need for the government to adequately address the challenges faced by extension agencies such as transport, stationery for farmer training, in service training resources and staff demotivation due to poor remuneration (extension staff are on US$250.00/month on average).

g) Off-farm income or income diversification should be promoted to avoid the risk associated with relying on farming alone.

h) Detection of localized crop failures should be part of a functioning early warning system.

i) Drought tolerant crops such as sorghum and millet may be promoted by government through a provision of ready markets for the same or grain exchange programmes at GMB, for example a farmer coming in with a tonne of millet and barter trade for maize, their favourite staple food.

j) Local leadership should be seen playing a more active role in leading drought mitigation strategies at community level that just to be associated with food aid distribution.

k) Food for work programmes have been successful when local management exists prior to drought, but the expectations of physical labour should be reduced in these programmes since they are eroding peopleôs ability to manage their domestic needs and to prepare their lands.

l) There is need for the government to expedite the review process of the Civil Protection Act that is set to be replaced by the Emergency preparedness and Disaster Management Act. This will pave way to the establishment of an authority that will be more robust in disaster risk reduction than the current scenario where activities of the Civil Protection Unit are mostly confined to disaster response. Response is more costly and unsustainable than mitigation.

7.4. Areas for further research

a) Need still exists to further understand the types of food security decision-making by rural households.

b) There is need to look at how vulnerability maps can be designed and be used in the first stages of targeting to improve the cost effectiveness of resource allocation.

c) Design and use of user friendly satellite remote sensing in the early warning systems.

d) More research into sustainable non farm incomes in the rural context.

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ANNEXURES

Annexure A: Household questionnaire

Drought Copping Strategies at Mutasa District in Zimbabwe

Assessment Survey

Household Questionnaire

Introductions and information to obtain informed consent to be interviewed

My name is é é é é é é é é é é é é é é é .

We are conducting interviews with households in the area in order to understand more about your copping strategies with regards to drought and institutions that provide support in this ward as well as other wards in the district. Information collected from interviews will be confidential and no names of the interviewees will be published or shared. Household information will be kept confidential. This work is an MSc research whose results are for academic purposes and its specific objectives are:

a) To identify and assess coping mechanisms in place by individual households and the community

b) To identify local institutions involved in drought mitigation

c) To assess how local institutions have responded to disaster risk reduction

d) To review the capacity of local institutions involved in risk reduction

Please note that there is no benefit or incentive being given to participating in the interview now or in the future. You are free to decline to be interviewed, if you wish, or to decline to answer particular questions if you wish.

Are you willing to be interviewed? Yes/No

A. Interview Details	
Date	
Name of Interviewee	
District	
Ward	

Name of village	
Name of Field Supervisor	
Data Capturer	
Other information about sampling	

B. Household details	
1. Sex of Household head	Male ---------- ---------- 1 Female ----------2
2. Sex of Respondent	Male ---------- ---------- 1 Female ---------- 2
3. Relation to household head	Spouse ----------1 Son ----------2 Daughter ----------3 Self---------- ----------4 Other (specify) ----------5
4. Marital status of HH	Single --------- ---------- 1 Married ------- ---------- --2 Divorced ---------- 3 Widowed ----- ---------- --4 Other (specify)----------5
5. Respondent Age:	Below 18 years ----------1 18 - 24 years ----------2 25 -30 years----------3 31- 45 years ----------4 46 ï 60 years----------5 More than 60 years ------6
6. Education level of Household head	Never attend school -----1 Primary school ----------2

	Secondary school ------- 3 Post- secondary ----------4
7.Family size (*People living with the HH for over 3 months)*	1 ï 4 members ----------1 5 ï 10 members ---------- 2 More than 10 members - 3
8. Number of children in the Household (*children being people below the Age of 18 years)*	0 ï 4 Children ---------- 1 5 ï 10 Children ---------- 2 More than 10 Children -- 3

C. Agricultural production

9. What is the hactarage you plant every season? ----------

How do you cope in times of drought? Indicate whether you use the following mechanisms to cope during drought.

10. Change variety of seed planted	Yes -------1 No --------2
11. Increase hectarage of drought resistant crops	Yes -------1 No --------2
12. Get assistance in the form of agricultural inputs from Govt/NGOs/any other source	Yes -------1 No --------2
13. Stagger planting dates to reduce risk of drought spells	Yes -------1 No --------2
14. Change farming method	Yes -------1 No ------ -2
15. Get food assistance from Govt/NGOs/any	Yes -------1 No --------2

What are the livestock numbers	16.Cattle ----------	Less than 5 ï (1), 5 ï 10 ï (2), Above10 ï (3)
	17.Goats ----------	Less than 5 ï (1), 5 ï 10 ï (2), Above10 ï (3)
	18.Donkeys -------	Less than 5 ï (1), 5 ï 10 ï (2), Above10 ï (3)
	19.Poultry ---------	Less than 5 ï (1), 5 ï 10 ï (2), Above10 ï (3)
	20.Other Specify)	Less than 5 ï (1), 5 ï 10 ï (2), Above10 ï (3)

D. Food/income sources and coping strategies

21. What has been your major source of food during the last five (5) years?

Own production ---------- 1

Buy from shops ----------ï 2

Borrow from neighbours ------3

Remittances ----------4

Through barter/exchange --- 5

Food Aid ---------- 6

Casual labour ----------7

Other (specify) ---------- 8

22. What has been the major source of income for the household in the last 5 years?

Formal employment ---------- 1

Peasant Farming ---------- 2

Remittances ----------3

Casual labour ---------- 4

Hiring out assets ---------- 5

Petty trading ---------- 6

Other (specify) ---------- 7

23. For the past five years, how many of these have you harvested below your expectations.

1 ---------- All the years

2 ----------4 out of 5 years

3---------- 3 out of 5 years

4---------- 2 out of 5 years

5---------- 1 out of 5 years

6---------- Good harvest in all the years

24. During this five year period, in which year did you harvest the lowest yield.

2009/10----------1

2008/9----------2

2007/8----------3

2006/7----------4

2005/6----------5

n/a (not farming----------6

Which of the following coping strategies are you forced to do in times of drought?

25. Skip some of the meals	Daily ----------1 More than once a week --- 2 Once a week ---------- 3 Rarely ---------- 4
26. Reduce size of food portion	Daily ----------1 More than once a week --- 2 Once a week ----------3 Rarely ---------- 4
27. Go the whole day without food	Daily ----------1 More than once a week --- 2 Once a week ----------3 Rarely ---------- 4

28. Eat unusual wild fruits, vegetables and other foods	Daily ----------1 More than once a week --- 2 Once a week ----------3 Rarely ---------- 4
29. Adults skip meals so that children can eat	Daily ----------1 More than once a week --- 2 Once a week ----------3 Rarely ---------- 4
30. Eat premature crops	Daily ----------1 More than once a week --- 2 Once a week ----------3 Rarely ---------- 4
31. Borrow from neighbours	Daily ----------1 More than once a week --- 2 Once a week ----------3 Rarely ---------- 4
32. Provide labour in return for food	Daily ----------1 More than once a week --- 2 Once a week ----------3 Rarely ---------- 4
33. Send other members of the household to other relatives (Specify members sent away)é é é é é é é .	yes ----------1 No ---------- 2
34. Sell livestock (specify)é é é é é é é é é é ..	Yes ----------1 No ----------2
35. Dispose household assets (specify)é é é é é é é é é é	Yes ----------1 No ----------2

E. Institutional Capacity

Which institutions are there for support during drought? (Where do you get your assistance from in times of drought?).

36. Government departments	Yes------ 1 No--------2
37. CBOs/NGO / INGO	Yes------ 1 No--------2
38. Local leadership and the community	Yes------ 1 No--------2
39. Friends and Relatives	Yes------ 1 No--------2
40. Other (Specify) ----------------	Yes------ 1 None----2
41. Has the support been adequate and relevant?	Inadequate-----------1 Fair --------------------2 Good ------------------3 N/A-------------------99

42. How often do personnel from the Department of Agricultural Technical & Extension Services (AGRITEX) or/and the Veterinary services (DVS) advise you during drought on crop and livestock management?

Often ------------------ -----1

Rarely-------- ---------------2

Never ------------------- ----3

43. Have you ever been involved in drought mitigation programs in your community?

Yes-------------------------1

No--------------------------2

44. If yes, specify.

é é

é ..

45. What do you think can be done by both the community and agencies to mitigate the drought impact in the area? ....

é é
é é é é é é é é é é é é é é é ..é é
é é

Thank you very much for your assistance.

(End Interview)

Other observations about/on the interview:

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Annexure B: Key Informant Guidelines

1. Do you see drought as a challenge to livelihoods in this district?

2. For the past five years in this district how many of them have been drought years? Which one was the most severe?

3. How do you try to influence the food insecure farming households to improve their food security?

4. During drought, which household member/s do you have the most contact with? (Probe for head of household, male/female, age, etc)

5. What coping strategies are commonly used by households in this community during periods of drought?

6. Which are the strategies that are used more or only by the most food insecure households?

7. What community support structures currently exist to assist households to cope with drought? Can you tell us about these and how well they work?

8. Now looking at the most food insecure households, in what ways do community leaders and communities in this area currently support and include people from the most food insecure households? Please give examples where possible.

9. What are the other agencies that are actively involved in drought mitigation in the district?

10. Can you describe their key programs in the communities and impact if any?

11. What are the major challenges of these agencies?

12. What do you think can be done better by these communities and other stakeholders to mitigate the drought impact?

Thank you for your cooperation

Annexure C: Guidelines for FDGs

1. Do you see drought as a challenge to your livelihoods in this district?

2. For the past five years in this district how many of them have you harvested below your expectations? Which one was the most severe?

3. How do you try to improve food security in your households?

4. During drought, which stakeholders do you have the most contact with? (Probe for programs done by the same)

5. What coping strategies do you commonly use in this community during periods of drought?

6. Which are the strategies that are used more or only by the most food insecure households?

7. What community support structures currently exist to assist households to cope with drought? Can you tell us about these and how well they work?

8. Now looking at the most food insecure households, in what ways do community leaders and communities in this area currently support and include people from the most food insecure households? Please give examples where possible.

9. What are the other agencies that are actively involved in drought mitigation in the district?

10. Can you describe their key programs in the communities and impact if any?

11. What are the major challenges of these agencies?

12. What do you think can be done better by this community and other stakeholders to mitigate the drought impact?

Thank you for making it here

Annexure D: VS&L explanation

The VS&L project is a community based saving and credit initiative by which the community members are mobilized to form savings groups. The project is targeted at women and children (though men are allowed to participate) who are trained on the VS&L methodology. These groups function on the basis of individual members saving with the group on a regular basis which is usually a month and at the same time borrowing from the group to finance income generating activities/projects (IGA/IGPs). The borrowed money is repaid within an agreed timeframe which is usually a month at an agreed interest rate. Group funds increase through regular savings and interest rates charged on borrowed funds. For each group the savings and borrowing activities go for an agreed period of time called the saving cycle which is usually a year. At the end of the saving cycle which usually coincides with the end of the year, total group funds are shared among group members who are encouraged to use the money for the purchase of assets in addition to re-investment in IGPs, purchase of agricultural inputs and payment of school fees. To effectively manage this project at community level and for sustainability, cluster facilitators (CF) are trained to work with these groups at community level. The CFs are group leaders chosen by a group of clubs in a geographical area and undergo an extensive training program in the VS&L methodology. The CFs manages VS&L activities at community level and are the interface between VS&L clients and NGO Field officers.

Annexure E: Mutasa District rainfall (ml) data from year 2006 to 20111

	Months												
Year	**Jan**	**Feb**	**Marc**	**Aprl**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Total**
2006	159	132.4	292	4.5	4.4	3.8	4.5	3.5	0	35.5	50	92.3	781.9
2007	117	335	32.5	101.5	0.5	8	0	6	6	9	105	492	1212.5
2008	210.5	63	51	0	18.5	2	2.5	6	3.5	5.5	17.5	267.4	647.4
2009	166	74.5	97.8	25.5	19.5	23.5	9	0	4	6.5	93.5	103	622.8
2010	90.5	269.5	82	93.5	3	6.3	13	2.5	3.5	2	108	190.1	863.9
2011	312.5	62.5	98	66.5	0.5	1.1	11.5	1	2.3	12	90.5	156.5	814.9

Source: Department of Meteorological Services - Mutasa Weather Station (2011)