

**AN ANALYSIS OF DROUGHT PREPAREDNESS INTERVENTIONS IN
DALUKA WARD, LUPANE DISTRICT, MATABELELAND NORTH,
ZIMBABWE**

By

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Declaration

I, Tobias Ndlovu hereby declare that this dissertation, submitted for the fulfilment of a Master's Degree in Disaster Management at the University of the Free State, is my original work and independent investigation and has not been previously submitted in its entirety or part by me or any other person to this University or any other institution of higher education for the awarding of any qualification. All the sources that I have used or quoted have been indicated or acknowledged by complete references.

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Dedication

I dedicate this study to my late father Thomas who above all prioritised education and that learning, and education has no end. He believed that all his children would achieve greatness. To my wife Nomalanga, my son Denzel Njabulo and daughters Hazel Thabiso and Tiffany Nokuhle this is your least achievement. To God be the Glory forever and ever.

Abstract

Drought is a natural phenomenon and affects almost all areas of the world. What is important is for those communities at risk to prepare and plan for drought to lessen its impact on their livelihoods. Analysis of drought preparedness, therefore, helps to explain why some communities are hard hit by the effects of drought and some are continuously affected by droughts. This study analysed drought preparedness interventions in Daluka ward of Lupane district in Matabeleland North province of Zimbabwe. The research objectives that guided the research study were to; assess drought preparedness planning interventions; assess the challenges faced by communities when responding and recovering from drought disaster; determine the effectiveness of drought preparedness interventions in Daluka ward and make recommendations concerning relevant drought preparedness interventions for Daluka ward.

The researcher used a case study qualitative research method to do an in-depth analysis of drought preparedness. The main findings of the study showed that Daluka ward is not prepared to deal with drought. Lack of preparedness stems from the fact that the frequency and impact of drought seem to be increasing, coupled with underlying poverty and poor soils, the community has failed to respond and fully recover from each drought event. Poverty and the increased frequency of drought have eroded the community's adaptive and absorptive capitals. The study identified that interventions that are meant to manage drought are reactive and focus on drought response. Most interventions are meant to provide short term relief when drought strikes. The centralised management of drought makes it difficult for the community to participate in the drought preparedness and response role being handed over to the government and NGOs. On the other hand, the government and NGOs have not involved the Daluka community in drought risk assessment, information and early warning systems. Preparedness has not been effective and there is no action even after early warnings are given. Capacity building and training that is provided by the government and NGOs focus mainly on conservation agriculture which focuses on food production ignoring water resources management and other adaptive strategies. The study, therefore, recommends that drought management should be more proactive and increase the participation of community members in resources mobilisation for preparedness and response. Drought planning should thus start at the micro-level (village) and emphasis should be on preparedness and mitigation instead of response. Preparedness will ensure there is an effective drought response.

Key words: Drought, Preparedness, Daluka, Lupane

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List of Abbreviations and Acronyms

AIDS	Acquired Immuno Deficiency Syndrome
CA	Conservation Agriculture
CADRI	Capacity for Disaster Reduction Initiative
COVID-19	Coronavirus disease 2019
CPC	Civil Protection Committee
CPU	Civil Protection Unit
CRED	Centre for Research on the Epidemiology of Disasters
DRR/CCA	Disaster Risk Reduction/Climate Change Adaptation
FGD	Focus Group Discussion
HFA	Hyogo Framework of Action
HIV	Human Immunodeficiency Virus/
IASC	Inter-Agency Standing Committee
IPCC	Intergovernmental Panel on Climate Change
KII	Key Informant Interview
NGO/CBOs	Non-Governmental Organisation/Community Based Organisation
SFDRR	Sendai Framework for Disaster Risk Reduction
UN	United Nations
UNDP	United Nations Development Programme
UNISDR	United Nations Office for Disaster Risk Reduction
ZIMSTATS	Zimbabwe Statistics

Glossary of terms and concepts

Disaster

UNISDR defines a disaster as a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its resources (UNISDR, 2009). Disaster impacts may include loss of life, injury, disease and other negative effects on human physical, mental and social well-being, together with damage to property, destruction of assets, loss of services, social and economic disruption and environmental degradation.

Drought

A drought is defined as a period of abnormally dry weather sufficiently prolonged for the lack of water to cause a serious hydrologic imbalance in the affected area (Glossary of Meteorology, 1959). Drought is a period of unusually persistent dry weather that persists long enough to cause serious problems such as crop damage and/or water supply shortages. The severity of the drought depends upon the degree of moisture deficiency, the duration, and the size of the affected area. There are four different types of drought which are meteorological, agricultural, hydrological and socioeconomic.

Disaster Risk Reduction

DRR is defined as actions aimed at disaster risk reduction through systematic analysis and management of disaster causes, reduction of hazard exposure, lessening of the vulnerability of property and people, land, environment management, and improving preparedness to hazards.

Preparedness

The knowledge and capacities developed by governments, professional response and recovery organizations, communities and individuals to effectively anticipate, respond to and recover from, the impacts of likely, imminent or current hazard events or conditions. Disaster preparedness activities and measures are taken in advance to ensure an effective response to the impact of hazards, including the issuance of timely and effective early warnings and

the temporary evacuation of people and property from threatened locations (UNOCHA & UNISDR, 2008).

CHAPTER ONE: INTRODUCTION AND BACKGROUND

1.1 Introduction

Drought is an extreme climatic phenomenon that is not understood completely even today (Mishra & Singh, 2010). It affects more people than other natural hazards like cyclones, volcanoes and others (Wilhite Ed, 2000a). For example, drought accounted for only 5% of the global disaster events between 1994 and 2013 but affected more than one billion people which is about 25% of the global population (CRED, 2015). In Zimbabwe, the 2001/2002 drought affected six million people which was approximately 50% of the entire population (National Contingency Plan, 2013). In Southern Africa droughts have increased in frequency, resulting in negative socio-economic and eco-hydrological impacts that include loss of livestock and crops, water scarcity, indirect health effects amongst others (Wilhite, 2002). Despite financial and capacity investments in disaster risk reduction, poor communities like those in rural areas of Zimbabwe are often ill-prepared to deal with drought events.

The Sendai Framework for Disaster Risk Reduction (SFDRR) 2015-2030's fourth priority focuses on enhancing disaster preparedness to achieve an effective response, building *'back better in recovery, rehabilitation and reconstruction* (UN, 2015). Priority number five of the Hyogo Framework of Action (HFA) 2005-2015 (UNISDR, 2005), is about strengthening preparedness for effective disaster response at all levels of the society to protect lives and livelihoods. According to HFA, strengthening preparedness for disaster hazards has two objectives. Firstly to enhance the capacity of institutions and people to predict and secondly, to effectively monitor and to be prepared to mitigate adverse impacts and address possible threats and strengthen disaster preparedness (UN/ISDR, 2008). SFDRR and HFA emphasise that disaster preparedness as part of disaster risk reduction (DRR) and climate change adaptation (CCA) initiatives that contribute to sustainable development and resilience. The state of preparedness or readiness determines the effectiveness of any response, recovery, rehabilitation and reconstruction after a disaster strikes. Preparedness is an important investment against man-made and natural hazards. It secures the humanitarian community valuable time to effectively respond and protect vulnerable people against repeated crises which reduces their resilience and pushes them into poverty (IASC, 2011).

The topic of disaster preparedness has been deliberated in many discussions, conferences, policy-making agendas, however, Chatora (2007) noted that many disasters that have occurred recently continue to expose a lack of preparedness and contingency planning. Documenting lessons learned from the 2019 tropical cyclone IDAI that hit Mozambique and

Zimbabwe (Chatiza, 2019) highlighted the lack of preparedness as one of the main causes of ineffective cyclone response. Similar observations were made by the International Federation of Red Cross (IFRC, 2007) that the cyclone in 2000 in Mozambique and Zimbabwe showed a lack of preparedness. Furthermore, lessons learned in the 1991/92 drought crisis in Southern Africa highlighted the need for the Zimbabwean government and communities to build capacity regarding drought preparedness and the initiation of appropriate risk management systems that include drought preparedness (FAO, 2004). Mudimu (2003) highlighted that Zimbabwe was ill-prepared for the drought-induced crisis of 2002 despite previous success, experiences and early warning.

Disaster preparedness is important at national, sub-national, district, ward, household and personal levels. It is important, therefore, not to evaluate preparedness for disasters based on policies, actions and inactions of international or national institutions and humanitarian organisations but also by understanding the actions of vulnerable communities themselves. Academic disaster management practitioners have developed community-based and community-managed disaster risk reduction tools to identify, warn, predict, prepare and measure hazards before they strike. The tools vary from traditional methods like indigenous early warning systems, technologically based tools to hybrids.

The need to strengthen disaster preparedness at all levels to effectively result in *building back better* as prioritised in SFDRR 2015-2030 have become buzz words in all levels of society. Millions of United States dollars have been poured into government, humanitarian organisations and communities in response and (DRR/CCA) activities. Governments, humanitarian organisations and vulnerable or at-risk populations have contributed to volumes of plans, white papers, policies and strategies to reduce disaster risks and prepare for disasters. Some of these plans and strategies have been turned into real actions by government organs, humanitarian organisations and vulnerable communities.

This research analyzed Daluka ward 19 in Lupane district in Matabeleland North community's based and community managed drought preparedness interventions to determine whether they are effective for drought response. The research followed a case study format, aimed at assessing the effectiveness of drought preparedness interventions by government, NGOs and affected communities themselves. This study was founded on the Disaster Risk Reduction National Action Plan 2015-2030, Zimbabwe climate change policy in 2016, National climate change response strategy in 2019, roll out programmes such as the Zimbabwe Resilience Building Fund (ZRBF) in 2016 by the United Nations Development Programme (UNDP, 2016) and other initiatives that seek to strengthen disaster response in general.

1.2 Background of the study area

1.2.1 Location of the study area

Daluka ward 19 is in Lupane district of Matabeleland North Province of Zimbabwe. Lupane coordinates are 18°45'0" S and 28°10'0" E; Lupane district is on an elevation of 1,049 meters above sea level. It borders Binga and Hwange districts to the north, Bubi district located on the south and Tsholotsho district located to the west. Daluka ward 19 is one of the 28 wards of Lupane district. It is situated 30km from Lupane town and 141km from the City of Bulawayo. Figure 1.1 below shows the position of the study area.

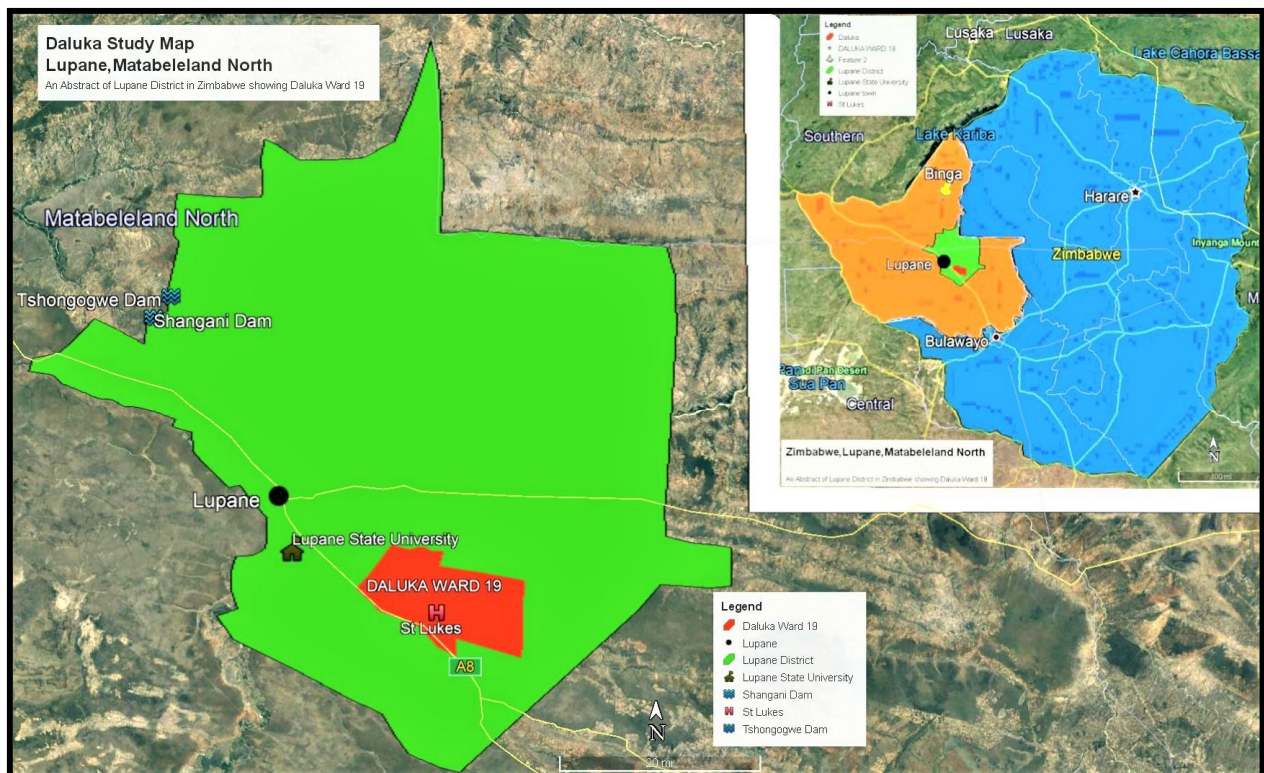


Figure 1.1: Map of Zimbabwe showing Lupane district and location of the study area
Source: Author construction using GIS software (2020)

1.2.2 Geography of the study area

As most of the district wards, Daluka is in an agroecological or natural region (NR) IV. NR IV is characterised by erratic average annual rainfall of 450-650mm with seasonal droughts (UN/OCHA, 2012). However, according to the Agritex Department in Lupane, the average annual rainfall for Daluka ward is much lower. These Agritex observations support the recent calls to reclassify agro-ecological regions in Zimbabwe. Chikodzi, Simba and Murwendo, (2013) advocate for the review and re-classification of agro-ecological zones in Zimbabwe due to climate-related impact that continues to change environmental and other weather conditions. In Daluka ward 19, the rainy season is unimodal with most rains falling between November and April (Makungurutse, Nyapwere, Manyanga & Mhaka, 2018). The geology of

the area comprises less fertile sandstone also known as Kgalagadi sands. The soils have high permeability and are less fertile, straining crop production severely. Those who are lucky to find some cropping space along the valley are affected during drought as soils along the valley drain into Bubi river (WFP, 2016). Although, Daluka ward 19 and Lupane district, in general, have limited capacity to produce adequate food due to droughts and soil infertility it is rich in indigenous timber forests mainly hard timber trees like *mukwa*, mahogany and Zambezi teak (*baikiaea plurijuga*). The forest ecosystem seems to be healthy due to the nature of moisture retention in deep sandy soils that favour the growth of trees.

1.2.3 Socio-demographics of Daluka ward

Lupane district is part of the seven districts in Matabeleland North Province, Zimbabwe. The district has a population of 103, 509 people in 28 wards (ZimStats, 2012). Daluka ward 19 is one of the poor wards. Daluka ward is coded as ward 19 and has a population of 4,335 people and 850 households (WFP, 2016). Daluka ward has seven villages namely Daluka, Gandangula, Sivalo, Mafinyela, Sibangani 1, Sibangani 2 and Strip Road. Daluka according to ZimStats (2016) had a food poverty prevalence of 53.9%.

Table 1.1: Daluka ward population

Village	Number of households	Population
Daluka	176	898
Gandangula	138	704
Sivalo	119	607
Mafinyela	128	653
Sibangani 1	98	500
Sibangani 2	96	490
Strip road	95	485
Total	850	4335

Source: Zimbabwe Resilience Building Fund (2019)

1.2.4 Economic activities of Daluka ward

Daluka ward is located in what could be described as a climate risky environment, it has poor soil fertility but the land use is mostly agriculture-related (Ncube et al., 2009). Communities practice mostly subsistence farming which often suffers from periodic seasonal droughts coupled with very severe mid-season dry spells that result in reduced crop yield. The main livelihood activities include production of main staple crops like maize, cowpeas and selling other crops like melons and pumpkins, small scale garden vegetable production and sales, livestock rearing and selling of small stock, casual labour, beer brewing, gathering of wild fruits, illegal timber harvesting, charcoal making, and wetlands and valley cultivation. Some of these activities result in the degradation of natural environments and ecosystems as communities tend to overexploit natural resources.

1.3 Problem statement

The increasing climate-related catastrophic events, people affected, economic damage, population and infrastructure at risk is one of the 21st century's biggest concern. Worldwide, in 2019, approximately 95 million people were affected by disasters, 11,755 died and nearly 130 billion US\$ spent on disaster response (CRED, 2020). The great concern is the increasing impact of disaster events, especially in developing countries. Developing countries are battling with underlying conditions like poverty. This makes them less prepared for any disaster, making it difficult to respond and restore communities to better conditions that mitigate the impact of future climatic hazards. For example, nearly 50% of those affected by disasters in 2019 came from four developing countries, the Philippines, India, Iran and Zimbabwe (CRED, 2020). Analysis of all the disastrous events that happened in 2019 shows that climate-related events like drought accounted for 31%, storms 35% and floods 33% of those affected.

Although drought is a natural climatic feature, the developing world is facing challenges managing it. In 1997 the United Nation Office to combat desertification and drought preparedness and mitigation assessed several Sub-Saharan Africa countries. The assessment revealed that most countries in Southern Africa except Botswana and South Africa have little experience in proactive drought planning, preparedness and contingency planning (Wilhite, 2000). Challenges facing Sub Saharan African countries noted by the UN Report was that drought preparedness was not regarded as part of sustainable development planning, institutions are not well defined and there is limited local involvement at district levels (Wilhite, 2000).

Zimbabwe is one of the countries that is heavily affected by droughts (Jiri et al., 2017). Drought occurrences in Zimbabwe are traced back to 1946-47 (Chigodora, 1997). The data in Table 1.2 below outlines ten natural disaster events in Zimbabwe between 1982 and 2011 and its shows that droughts affected several millions of people compared to other hazards like floods and epidemics.

Table 1.2: Natural disasters in Zimbabwe, 1982 - 2011

Disaster	Year	No. affected
Drought	2001/02	6 million
Drought	1991/92	5 million
Drought	2007/08	2,1 million
Drought	2010/11	1,68 million
Drought	1982/83	700,000
Epidemic	1996	500,000
Flood	2000	266,000
Epidemic	2008	98,349

Drought	1998/89	55,000
Flood	2001	30,000

Source: Zimbabwe National Contingency Plan (2013)

Eighty percent of the population in Zimbabwe lives and depend on rural areas (Belle, Moyo & Ongundeji, 2017). Many rural people in Zimbabwe’s livelihoods are based on subsistence farming activities that depend on seasonal rains. Relying primarily on rain-fed agriculture makes poor people vulnerable to climatic variability which threatens the sustainability of their livelihoods (Andear, 2009). Droughts in Zimbabwe have serious social-economic, environmental consequences like migration, famine, deaths and land degradation amongst others.

OCHA, UNCT Zimbabwe (2020) shows that six million people will need food assistance and a total of 483.4 million United States Dollars is needed to feed the people. Although food insecurity in Zimbabwe is not attributed to drought, it exacerbates pre-existing challenges that include declining economic and agricultural productivity coupled with poverty and insecurity (Brown et al., 2012). Zimbabwe was regarded as the “*Breadbasket of Southern Africa*”, but droughts have forced millions into food insecurity, turning the country into a “*begging basket case*”, (Mpofu, 2014).

Underlying vulnerability conditions like poverty, economic agricultural decline, environmental degradation cascades down to poorly resourced and poorly prepared rural areas like Daluka ward 19 (Gwimbi, 2007). Successive droughts in Daluka wards has over the years negatively impacted crop yield per hectare from 4mt/ha to less than 1mt/ha (Graef & Haigis, 2001; ZimVaC, 2012). Water availability for livestock has also been affected resulting in hundreds of livestock succumbing to drought further increasing poverty. Underground water levels have gone down due to a lack of rain that re-charges the water table. Borehole drilling is now expensive as the drillers must go deeper to more than 60m (Zimbabwe Water Authority, 2015). All these challenges have worsened food insecurity, causing chronic malnutrition amongst the most vulnerable members of the community. According to ZimVac reports (2015), people in Daluka ward 19 often adopt negative coping mechanisms that include prostitution, disposal of livestock and household assets making them poorer.

Despite these challenges, government, UN-WFP, NGOs and communities continue to wait until a new drought strikes and move in with response food/cash assistance (ZRBF, 2020). One of the major donors for food aid and assistance in Zimbabwe is United States Aid (USAID, 2020) which reported that it has injected millions of US Dollars or thousands of equivalent metric tons of food assistance in Zimbabwe as shown in the table below.

Table 1.3: Total contribution of USAID to Zimbabwe between 2017 - 2019

	US Dollars	Metric Tons
Fiscal Year 2017	\$56.8 million	40,922MT
Fiscal Year 2018	\$54.5 million	14,064MT
Fiscal Year 2019	\$122.2 million	51,752MT

Source: USAID Food Assistance Fact Sheet Zimbabwe (2020)

An investigation into prolonged food aid programmes in Zimbabwe in 2011 recommended for a radical shift by state, none state actors to focus on drought preparedness and mitigation rather than on emergency response only (Ndlovu, 2011).

Government and NGOs have intervened with drought preparedness as part of relief exit, whilst others like under the umbrella of Zimbabwe Resilience Building Fund initiatives are part of Disaster Risk Reduction programmes. Drought preparedness interventions include stockpiling grain, improving grain storage, drilling of boreholes, small water conservation agriculture projects, community awareness and public education including expanding agriculture extension work, weather information dissemination and others.

The government of Zimbabwe also consented to HFA and subsequent SFDRR. Furthermore, the government of Zimbabwe developed the Zimbabwe National Contingency Plan (2013), National Drought Plan for Zimbabwe (2016) and a National Drought Risk Capacity Operational Plan for Early Response in 2019 to complement the Civil Protection Act No 10:06 of 1989 as enabling legislation and policy frameworks to support drought management in Zimbabwe.

Although several preparedness interventions have been implemented, policy frameworks put in place, coordination platforms established, poor communities like those in Daluka ward 19 are still not prepared when drought strikes. For example, communities continue to plant maize crop which is a staple crop in the communities but very sensitive to erratic rains and dry spells (Michler et al., 2019). Chigodora (1997) recommended that the Zimbabwean Government should put in place drought preparedness and poverty alleviation programmes.

This study seeks to analyse several interventions implemented to increase drought preparedness in Daluka ward 19 to see if they are effective in response, rehabilitation recovery and in helping to mitigate impacts of droughts.

1.4 Research questions

According to Maree (2007), a research question outlines the objective of the research, it is useful in formulating questions for data collection. The research question should be open-minded and should allow all sort of outcomes from the research. The following questions were used to guide the formulation of questionnaires (Maree, 2007).

1.4.1 Main research question

- Are drought preparedness interventions carried out in Daluka ward effective for drought response, rehabilitation and recovery?

1.4.2 Research sub-questions

- Which drought preparedness interventions are implemented in Daluka ward 19?
- What challenges are faced by communities in drought preparedness and management?
- Which community structure is responsible for drought preparedness?

1.5 Research objectives

The overall objective of the study was to analyse the effectiveness of drought preparedness interventions in the Daluka ward 19 of Lupane district in Matabeleland, Zimbabwe.

1.5.1 Sub objectives

The sub-objectives of the study are:

- To assess drought preparedness interventions in Daluka ward in Lupane District.
- To assess challenges faced by communities in responding and recovering from drought disaster.
- To determine the effectiveness of drought preparedness interventions in Daluka ward.
- To make recommendations on relevant drought preparedness interventions for Daluka ward.

1.6 Significance of the study

This study intends to assist the government, NGOs and communities to develop relevant drought preparedness interventions that enhance effective response, rehabilitation and recovery. It will also assist the government, NGOs and community groups to manage droughts and enhance drought preparedness interventions and strategies. Though drought events are a common natural phenomenon and efforts worth millions of United States dollars are being poured to reduce the impacts of droughts, communities continue to suffer from its negative effects.

The scope of this study is different from other previous studies for example by Wilhite (2002) which focused on preparedness and response for droughts in *Sub-Saharan Africa* and evaluated policies that were put in place by member countries to prepare for disasters.

Another similar study focused on the impact of drought policy in rural areas of Zimbabwe (Dube, 2008). The study by Mushore (2013), focused on drought mitigation *strategies effectiveness* in the rural districts of Zimbabwe, however, this study is different in that it focuses on a different location and drought mitigation is different from drought preparedness. Although drought mitigation and drought preparedness are all part of drought risk reduction, mitigation refers to sustained actions aimed at reducing or eliminating drought risks, on the other hand, preparedness relates to *the state of readiness* to deal with drought (Bullock, Haddow and Coppola, 2013).

This study will contribute towards raising awareness on the need for multi-sectoral and interdisciplinary drought preparedness as it will expose the strengths and shortcomings of interventions, institutions and policies. As a case study, lessons learnt will be documented and these lessons may be used by humanitarian organisations and governments to develop strategies for similar rural communities.

The results of this study will provoke other practitioners and researchers to analyse other components of DRR like mitigation or the disaster preparedness framework as these areas are not adequately researched.

Recommendations of this study might also set an agenda for the debate on which disaster preparedness interventions are relevant in poor communities. It might identify the starting point for planning and thereby influencing policy and practice in Africa concerning drought management. Donors and governments might use the recommendations from this study to allocate resources to disaster risk reduction activities.

1.7 Research methodology

The section explains the design of the study and the methodologies employed to achieve the overall objective of the research.

1.7.1 Research design

The design of a study is regarded as a blueprint or plan of how the research will be conducted (Babbie, 2001). It answers questions on the type of study to be undertaken that would answer the research problem.

This research took a case study format. A case study was used because the research sought to answer the question of why communities are ill-prepared or not prepared every time drought strikes. According to Yin (2009), a case study is a relevant research design where a researcher asks '*how*' and '*why*' questions. A case study according to Babbie & Mouton (2004) produces important results in social and behavioural science research.

The limited-time available for the study made the case study to be viable for the research. The study focused on one locality, in this case, Daluka ward 19 making it easy to gather in-depth information rather than trying to get little information from different areas. This method was used in this research taking into consideration the available budget, time and applicability of the whole process (Babbie, 2001). The research was carried out at a time when the COVID-19 pandemic was spreading across the communities hence there was a need to limit contact with communities by focusing on one unit. This approach is supported by (Yin, 1194) in (Babbie & Mouton, 2004), who suggested that a case study is appropriate for the investigation of one unit. One advantage of a case study is that it cannot be manipulated by the researcher and can deal with wide evidence collected using different methodologies (Henning, Van Rensburg & Smit, 2004).

Babbie (2001), stated that as an empirical study a case study “*addresses a real-life problem*”. This case study used empirical evidence from the survey to explain why communities remain unprepared for droughts even if many interventions and lessons have been learnt from other droughts occurrences. Therefore, the analysis of the effectiveness of drought preparedness interventions, identification and interpretation of those interventions and making sense of people's perspectives and their opinions about their situation is achieved.

1.7.2 Population and sampling

The population of the research is defined as the number of elements which are in the study area the researcher is concerned about (Babbie & Mouton, 2004). The target population of this study were the household members in the seven villages of Daluka who participate in drought relief, disaster risk reduction and development programmes. These included the members and beneficiaries of food aid, cash transfers, conservation agriculture, nutrition gardening, water rehabilitation projects, village lending and saving schemes, HIV and AIDS home-based care groups amongst others. The research also targeted the focal people in the government department working on drought relief and management, agriculture and water extension, NGO focal personal carrying out drought relief and preparedness interventions, community leaders responsible for drought management and community-based disaster risk reduction project participants.

1.7.3 Sampling and sampling techniques

The process of identifying certain elements from the whole population is called sampling (Leedy and Ormrod, 2005). Generally, the researchers do not utilise the whole population but select a group that represents the entire study population. This study used the purposive

sampling technique. The advantage of the purposive sampling method is that gives room for the researcher to choose “*information-rich cases for in-depth analysis*” of the issues central to the research (Hannes & Lockwood, 2011). According to Bowling (2002:187-188), it can be called “*judgment sampling*” as the sample is selected because of knowledge or skill relevant to the research. The research sampled a total of 6 key informants ranging from community leaders, government departments and NGOs. Two focus group discussion were held.

Daluka ward has seven villages and the study included all seven villages in the sampling frame. On average each village had at least 10 community leaders making a total of 70 leaders. A total of 49 village-level community leaders which is seven from each village were selected from a list of communities’ leaders with knowledge of drought interventions in the area as part of purposive sampling, also depending on their availability and willingness to participate in the survey. Forty-nine (49) leaders represent 70% of the community leaders in the wards. According to Mouton & Marais (1990) when the research is interpretive such as a case study then 30-50 respondents are regarded as valid. It was difficult to reach out to all the leaders due to COVID-19 restrictions and time constraints. Village leaders included traditional leaders, political leaders, women, religious leaders, community home-based care representatives, professionals including teachers, nurses and other leaders.

There are approximately ten NGOs and (CBOs) working in Daluka ward 19. The study included all ten drought relief and drought preparedness focal personal working in the ward and ten project volunteers who are employed by NGOs and CBOs but grew up in Daluka ward 19 and have knowledge of the area. This made it twenty NGOs and CBO representatives. There are seven government representatives based in the Daluka district, seven ward-based government representatives were identified as participants for the research. Research participants who are based in the community had first-hand knowledge of the area and different organisations and projects in the ward. These included leaders of the civil protection unit, Department of Agriculture, Department of Social Welfare, Department of Water Environment Management Agency, Forestry Department and Ministry of Health.

Additionally, 24 adult members (12 female, 12 male) of disaster risk reduction projects, drought relief projects participated in the focus group discussions (FGDs). The FGD participants were seconded for discussion by NGOs and CBOs working in Daluka ward.

1.7.4 Data collection

The research made use of a questionnaire to collect data. A questionnaire is a primary data collection tool (Cohen, Manion & Morrison, 2013). Questionnaires were used to collect responses from 76 interviews with key informants and three FGDs.

1.7.4.1 Focus group discussions

A focus group discussion (FGD) questionnaire is a tool used by a researcher where individuals assemble to deliberate on an identified topic. FGDs draws from personal beliefs, various experiences, attitudes and perceptions through a moderated discussion (Hayward, Simpson & Wood, 2004). The research used information from FGDs of between 8 and 12 adult women, 8-12 adult men who are participants of community-managed DRR projects and drought relief committees. The FGD questionnaires collected participants views on drought impacts, preparedness activities and their perceptions on various interventions implemented in their communities and the researcher. During discussions, participants followed social distancing and used masks in line with COVID-19 guidelines. The researcher ensured that all applicable government and UFS regulations and protocols relating to COVID 19 were followed.

1.7.4.2 Key informant interviews

The data collection tool used to collect data from 76 key informants was a questionnaire. Due to COVID-19 lockdown and restriction, a combination of telephone calls and emails were used to collect data from village leaders, NGO representatives and government department ward representatives. The researcher pre-arranged the appropriate time for phone calls as contemporary telecommunication technology sometimes makes it difficult to reach the actual person on the phone (Williman, 2011). The questions were semi-structured. These interview methods are useful in gathering information when a phenomenon cannot be observed directly (Patton, 2002).

1.7.4.3 Document reviews

The document review processes is a systematic process of drawing information, analysing and evaluating documents printed or electronic. The research examined project reports, proposals and donor reports to get the meaning and draw lessons and information (Corbin & Strauss, 2008).

1.7.5 Data analysis

The data collected was analysed and processed for it to be meaningful following the five steps that are outlined by Leedy & Ormrod (2001). A Statistical Package for Social Sciences

(SPSS) computer application was employed to analyse all the datasets from the questionnaires. SPSS was used because of the advantages stated by Leedy and Ormrod (2013).

- **Range of variable statistics** – SPSS can handle a sizeable number of data sets and has a number or multiple response analysis functions (Leedy & Ormrod, 2013). This made it easy to analyse the data with many respondents and multiple responses.
- **Speed of completion** – One advantage of SPSS is that it is easy to use and processes functions and analysis faster than other tools that need the researcher to define parameters.
- **User-friendliness** - SPSS is user friendly, easy to follow and results are presented in simple table formats.
- **Graphics** – SPSS can illustrate survey results through tables, bar charts, pie charts, and other cross tables that can be visualised graphically (Leedy & Ormrod, 2013).

1.7.6 Data validity and reliability

Validity refers to how appropriate the data collected relates to the reallocation of the study (Ghauri and Gronhaug, 2005). Field (2005) summarised the concept of validity by saying that the researcher should measure what should be measured. A data collection tool or instrument should focus on what should be studied. If the instrument can be used at a different time by different units of the population and remains the same, it is deemed reliable. The validity of the instruments has a bearing on the appropriateness of the inferences that would be made from the results of the study. It is the degree to which the measure of the construct is dependable or consistent (Drost, 2011).

Reliability relates to the extent to which results from a measured phenomenon is consistent and stable. It is connected to repeatability, if the same questionnaire is used again with the same population but a different sample the results should be consistent and stable.

The researcher used internal reliability or dependability as this approach can assess the construct; there is a high degree of similarity of the questionnaires used for different key informants and focus group discussions. Regarding validity, the research used construct validity as it focuses on the standardisation of questionnaires. Construct validity is important for standardisation; therefore, the researcher consulted the research supervisor to advise on the questionnaires.

1.8 Limitations

The limitations identified in carrying out this study are outlined in this section. Some drought preparedness interventions were specific to Daluka ward or Lupane District and this limited the applicability of the recommendations. The other limitation is that the research focused only on one ward of a district. According to Shamano (2010), although a drought disaster study is relevant to the community, focusing only on one hazard than taking a multi-hazard approach limited the scope of application.

Apart from budget and time constraint, another limitation was the COVID-19 pandemic and lockdown restrictions that made it difficult to travel for research purposes or the organisation of focus group discussions. The researcher had to seek authorisation to travel for FGDs and used a lot of money for calls and internet charges.

1.9 Delimitations

The research focused only on drought preparedness interventions in the Daluka ward that were implemented by the community, government institutions and humanitarian organisations.

1.10 Ethical considerations

1.10.1 Informed consent

Consent is whereby the identified respondent can choose to participate or not to. The researcher had to ensure that all the identified possible respondents understood the research goal and methods to be used (Best & Kahn, 2006). The researcher used direct consent where an agreement was obtained from the possible respondent directly. This helped the respondents to know what was being investigated and the purpose of the research. Respondents and community members who gave information and who allowed their pictures to be taken and used in this report signed consent forms.

1.10.2 Confidentiality of participants

According to Wiles (2008) confidentiality entails that all collected information that is identifiable about persons should not be "*disclosed without permission*". The concept of confidentiality is linked to issues of autonomy, respect and anonymity. The researcher made sure that no confidential information from the participants was shared with other people without their consent.

1.11 Report summary

Chapter 1 introduced what the study covered, concepts and definitions of terms, background and study area description, research problem, main and sub-questions, main and sub-objectives, the significance of the study, the methodology adopted by the study, data collection tools, data analysis, data reliability and validity of the study, limitations and delimitations of the study and ethical considerations.

Chapter 2 covered the legal and theoretical framework that is relevant to the topic of the research. Chapter 3 reviewed the literature to examine similar research, best practices, other experiences and lessons learned. Chapter 4 on the research methodology applied, focused on the case study design, covering the research design, research population, sampling technique, methods and tool for data collection and the way the data was analysed. Chapter 5 presented the research results and explained the findings of the study generated from the data and information collected from the reviewed documents and interviews. The last chapter presented all the relevant conclusions and. It outlined the actions that may need to be taken to improve preparedness and highlighted gaps for further research.

CHAPTER TWO: LEGISLATIVE AND THEORETICAL FRAMEWORKS

2.1 Introduction

The legislative and theoretical frameworks chapter discusses the legislations and theories that are pertinent to drought disaster preparedness and response. Legislative frameworks cover the laws, policies, agreements and regulations that are meant to enable particular actions to be generally accepted or implemented within the law. Discussion of the legislative framework is important and it provides and is a point of departure from which views and arguments of scholars are based. On the other hand, theoretical framework refers to the theories that are prevalent in the academic literature that has been reviewed and proven authentic by other researchers and scholars and are regarded as the accepted theory in the literature (Grant and Onslow, 2014). Reviewing theories relating to a particular subject provides a framework to view reality, theories provide sets of concepts, and assumptions define a phenomenon (Silverman, 2013).

Firstly this chapter reviews international, regional, and national enabling legal agreements, laws, and policies that support disaster risk reduction, disaster preparedness in general and apply them to drought preparedness. The enabling legislative environment starting with international treaties and agreements frameworks that Zimbabwe is part of is explored. Regional and national level laws, policies normally follow international frameworks and laws. Secondly, the theories and concepts of drought and disaster preparedness are discussed, and these provide clear views of the reality of drought and preparedness. Disaster preparedness is the first part of the phases of the disaster management cycle, therefore, preparedness is discussed on how it is linked to the management of drought disaster. Disaster preparedness is a component of disaster risk reduction; therefore, the Disaster Risk Reduction framework will be discussed, as it is critical in conceptualising disaster preparedness. Drought risk reduction framework elements proposed by UNISDR (2004) are reviewed on how links to the general disaster risk reduction framework provide a clear understanding of drought preparedness.

Kent (1994) proposed a disaster preparedness framework and the researcher used it to discuss and use it to review drought preparedness in the Daluka ward. Every element of the disaster preparedness framework was analysed and discussed in full details then applied to review and analyse drought preparedness in Zimbabwe.

2.2 Drought Management related Legislative Frameworks in Zimbabwe

2.2.1 Global resolutions and frameworks

2.2.1.1 UN General Assembly Resolution 59/212

Resolution 59/212 of the United Nations General Assembly calls on all member countries to ensure the implementation and adoption of effective legislative frameworks. The frameworks should be aimed at mitigating the negative effects of a natural disaster (United Nations, 2005). Furthermore, it calls on countries to ensure integration and mainstreaming of disaster risk reduction measures into the development agenda. Integration thus including disaster risk reduction activities like disaster preparedness, mitigation, capacity building when responding to disasters. This UN resolution is fundamental to this research and it is an overarching global legal framework for countries to implement and adopt disaster risk reduction whenever possible. This shows the importance of preparedness and its criticality in achieving effective disaster response. The same UN resolution provides the basis for disaster risk reduction frameworks like the Hyogo Framework of Action (2005-2015) and its predecessor the Sendai Framework for Disaster Risk Reduction (2015-2030).

2.2.1.2 Sendai Framework for Disaster Risk Reduction (2015-2030)

Sendai Framework for Disaster Risk Reduction (SFDRR) is one of the major post-2015 development agenda agreements. The SFDRR replaced the 2005-2015 Hyogo Framework of Action. The SFDRR has seven targets and four main priorities for actions and if achieved they do not only reduce disasters but also contribute towards achieving the Sustainable Development Goals (SDGs). The framework puts the primary role in disaster risk reduction on states. It encourages the participation of the whole community including those at risks and also urges participation of the private sector and local government in disaster risk reduction. SFDRR's main goal and priorities are to prevent reduce disaster risk and minimise losses (UNISDR, 2015). It aims for, *"the substantial reduction of disaster risk and losses in lives, livelihoods, and health and the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries"* (UNISDR, 2015). The aim of SFDRR shows that disasters affect all aspects of human and other natural systems so it is imperative for the states to invest in disaster risk reduction initiatives.

The SFDRR has four pillars as shown in Figure 2.1 below.



Figure 2.1: Pillars of the Sendai Framework for Disaster Risk Reduction

Source: CADRI (2017)

The four pillars of SFDRR for achieving disaster risk reduction, are depicted in Figure 2.1 above. The SFRDD's fourth pillar on *enhancing preparedness for effective response and building back better in recovery and reconstruction* is related to this research's main objective of analysing interventions to see whether they contribute to preparedness and subsequently effective response.

The good part is that most countries including Zimbabwe consented to the SFDRR. What is still a hurdle is the alignment of laws and policies to this international framework.

2.2.2 Africa regional frameworks

2.2.2.1 Africa regional strategy for disaster risk reduction (2004)

At the Africa continental level, there is the Africa Regional Strategy for Disaster Risk Reduction (ARSDRR). The ARSDRR calls on African countries to reduce disaster risks by investing in DRR initiatives. Initiatives include the expansion and enhancement of information systems to improve related data and information on development and disaster risk reduction. The African strategy underscores the need for strengthening public communication systems, satellite, space technology and geographic information systems to enhance access to information by the public. The ARSDRR further developed an implementation strategy for DRR called the Programme of Action (PoA) developed in 2005 and was subsequently extended in line with the Hyogo Framework of Action (HFA) 2005-2015 and further extended to be in line with Sendai Framework for Disaster Risk Reduction (2015-2030). African countries further reiterated the need to align the Extended Programme of Action to the SFDRR was made by the Yaoundé Declaration on the implementation of the Sendai Framework in Africa (2016).

Further to the SRDRR the Southern Africa Development Community SADC sub-region developed two strategic frameworks in 2019 again aimed at disaster risk reduction. The two strategic frameworks are SADC Disaster Risk Reduction (DRR) Strategic Plan and the

SADC Regional Resilience Strategic Framework. Both frameworks recognize that for the subregion to achieve sustainable development, SADC needs to address disaster risk holistically and inclusively. There is an emphasis on vulnerability and exposure reduction and resilience building of communities in member countries. It is important to note that the SADC strategies draw from Africa Regional Strategy for Disaster Risk Reduction and the African Programme of Action which is anchored on the SFDRR. To show the importance of disaster preparedness SADC region has hosted regional platforms and meetings namely the regional disaster preparedness planning conferences after disasters such as El Niño, disease outbreaks etc.

2.2.3 National legislations related to Droughts in Zimbabwe

2.2.3.1 Civil Protection Act (1989)

Effective national legislation is central to disaster risk reduction especially to recurring weather-related disasters like droughts globally. According to UN/ISDR (2008), it is hard to control a natural hazard like weather phenomena, but it is much easier to reduce disaster risks through clear actions that are articulated in relevant policies and laws. The Civil Protection Act Chapter 10:06 of 1989 of Zimbabwe is one such law that is aimed at giving the Department of Civil Protection (DCP) power to manage and coordinate all resources and stakeholders in Disaster Risk Management (Government of Zimbabwe, 1989). The Department of Civil Protection is under the control of the Ministry of Local Government, Public Works and National Housing. The Act also outlines the foremost governing framework that manages disaster risk reduction in Zimbabwe (Government of Zimbabwe, 1989). The Civil Protection Act orders the DCP to be multi-sectoral, coordinate all relevant stakeholders, like different relevant ministries, government institutions, NGOs, private sector, and communities working on disaster risk reduction (Mavhura, 2016).

Although the Civil Protection Act of Zimbabwe offers the regulatory framework, however, the Act has many inadequacies in addressing disaster risk reduction problems in Zimbabwe. One major failing of the act is that it mainly concentrates on civil protection and response ignoring disaster risk reduction.

2.2.3.2 Disaster risk management bill (2011)

This legislation is still not yet through parliamentary approvals when this research was conducted, but if it is passed it will succeed the Civil Protection Act 10:06. Although the draft legislation does not fully align with the SFDRR, however, covers many facets of DRR that are important for Zimbabwe (CADRI, 2017). According to CADRI (2017), the draft legislation needs improvement in four aspects outlined below;

- (i) Committees- Although the committees and sub-committees in the draft bill are representative of the governance structure, there is an incongruity of membership of committees national and those at district or lower structures and this could create some challenges when coordinating disasters.
- (ii) Responsibilities and functions – The draft legislation only stipulates the individual accountable for disaster coordination at the national level. Clarity at district and provincial levels is also required.
- (iii) Funding- the bill stipulates that 1% of the countries national budget should be allocated to the Department of Civil Protection for disaster management. This stipulation seems to be difficult to achieve as the country is going through a difficult situation economically and this is unachievable at present.
- (iv) Emergency services– the draft legislation also underscores the necessity of decentralised emergency resources and training services. Implementation of this recommendation needs to be reviewed as in some areas it may not be practical at the present moment.

Despite the shortcomings outlined above, the draft bill gives a broader apparatus for DRR and seeks to address the organisational and structural challenges that are in the current legislation. What is important also is that the draft bill promotes decentralisation and localisation of disaster preparedness and response in line with the Charter for Change's localisation agenda. It recommends setting aside one per cent of the nation's budgetary allocation for disaster risk management. If resources are provided then the government and local authorities will be able to carry out DRR interventions.

2.2.3.3 Meteorological services act (1990)

The Meteorological Service Act (1990) established the Meteorological Services Department (MSD). The MSD department is under the portfolio of the Ministry of Environment, Water, and Climate. Its main roles are to collect, analyse and disseminate weather and climatic information to the general public and other government departments. The department is responsible for giving weather forecasts, collect weather information, gives early warnings and guidance on weather-related hazards. The Meteorological Services Act is important in any discussion on drought in that drought is a weather and climate condition so how the Act is outlined is important as roles and responsibilities will be clear whenever there is drought or weather-related phenomena.

2.2.4. Other Policies and Strategy related to DRM in Zimbabwe

The table below shows a summary of the key policies and strategy frameworks that support drought management in Zimbabwe.

Table 2.1: Policies and strategies related to DRM in Zimbabwe

Policy/Strategies	Key Provisions
Zimbabwe National Policy on Drought Management (NPDM)	The National Policy on Drought Management was crafted by the government to spell out the responsibilities and roles of its different department in drought management in Zimbabwe. It also outlines the strategies that need to be undertaken by different stakeholders to mitigate and prepare for droughts. (Government of Zimbabwe, 1999).
National Climate Policy (2016)	The climate policy of Zimbabwe aims at guiding the country on how to reduce the impact of climate through adaptation and climate-smart approaches. It outlines adaptation strategies for economic, social, agriculture and other sectors. Like the national policy on drought management, the climate policy also spells out the responsibilities and roles of each government department in climate adaptation measures. It also shows government commitment to climate change mitigation and adaptation strategies that are outlined in the international frameworks like UNFCCC and other African regional bodies. This comprehensive policy also outlines plans for capacity building, resource mobilisation, technology investment for government departments like meteorology, hydrology and agriculture. It also details out the strategies and framework to establish the National Climate Fund. The National Climate fund compels the Ministry of Finance to allocate 10% of the national budget to climate mitigation and adaptation strategies National climate policy is vital to drought policy in the country as climate change contributes towards droughts.
National Policy and Programme on Drought Mitigation	The National Policy and Programme on Drought Mitigation compel the provincial and district government structures to prioritise and mobilise resources for drought mitigation. The strategies outlined in the policy include early warning, drought monitoring, drought-resistant crops amongst others. The policy promotes climate change mitigation as an important tool for managing drought disasters.

<p>National Climate Change Response Strategy (NCCRS) (2015)</p>	<p>The response strategy outlines the national framework for climate change mitigation and adaptation with a bias on the use of technology, public-private financing models, public awareness and education. The strategy was developed by scientists and aims at giving the policymakers various routes that can be taken by the country to minimise the impact on climate change. It goes further to identify potential resources in both the public and private sector that could be used in climate change adaptation and mitigation. It identifies international financing models like bilateral donors and international finance like Green fund that can be explored by the government and NGOs to increase the impetus on climate change mitigation and adaptation. The climate change response strategy is relevant to this research topic given the immense contribution of climate change to droughts in the world.</p>
<p>Zimbabwe Drought Risk Management Strategy and Action Plan (2017–2025)</p>	<p>The strategy gives those stakeholders involved in drought risk management guidance on how to manage drought risks. It outlines the drought risks in Zimbabwe and possible strategies on how to manage the risks. The action plan, therefore, outlines the implementation strategies, setting clear timelines, responsibilities especially of the Civil Protection Unit, resources required to achieve drought risk mitigation and adaptation between 2017 and 2025. The plan is imperative as it recognises gaps in material and financial resources needed. Like the NCCR above it also identifies possible sources of resources and coordination strategies that need to be in place to ensure effective drought risk reduction.</p>
<p>National Drought Plan</p>	<p>The National Drought plan identifies and describes the responsibilities and roles of all stakeholders involved in drought management in Zimbabwe. It also identifies the critical path that needs to be followed to reduce the negative impact of droughts in Zimbabwe. The plan is generally developed for drought response and there are a few strategies and responsibilities that are identified for drought risk reduction.</p>
<p>Zimbabwe National Contingency Plan (2012-2013)</p>	<p>This contingency plan was crafted in 2012 in a multi-sectoral and multi-stakeholder consultative process. The plan describes the hazards that are prominent in Zimbabwe, their impacts. It further prioritises hazards based on their impact and frequency and gives direction on how government and NGOs can assist in each hazard event. A plan is a vital tool for the government, NGOs, and the</p>

	private sector involved in disaster preparedness processes.
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Source: Compiled by Author (2020)

2.3 Disaster management structure in Zimbabwe

The structure of the Zimbabwe Disaster Management system is depicted in Figure 2.2 below. The structures at the highest level in the country, the Office of the President of Zimbabwe. When a disaster strikes the president appeals to the regional and international institutions such as SADC, UN, and INGOs. The National Civil Protection Committee, which is established as, described in section 2.3 above works with the Department of Civil Protection (DCP) to appeal locally from the treasury and other NGOs, mobilise necessary resources and ensure that disaster response is coordinated.

The Department of Civil Protection (DCP) is responsible for assessment, identification of the gap and coordination of all the disaster management actions. The DCP uses the multisectoral platform named Civil Protection Organisation under the Ministry of Local Government (Ministry of Local Government, 2009). The role of the platform is to provide advice, guidance and coordination. The National Civil Protection committee works closely with DCP, the Zimbabwe Vulnerability Assessment Committee (ZimVAC), and the Food and Nutrition Council (FNC) as depicted in Figure 2.2 below. The National Civil Protection Committee involves the security forces of the country namely the national police force, Zimbabwe National Army, Zimbabwe Prison services. Zimbabwe Red Cross also plays an important role in ensuring that committee members meet and plans are shared with other NGOs.

At the provincial level, provincial civil protection is managed by the provincial administrator. The provincial administrator works with officers from relevant government departments like water, agriculture, social welfare, and others. The provincial committee also comprises the provincial level security members, The provincial administrator co-opt some relevant stakeholders they feel can contribute to the management of disaster like the NGOs working the province, private enterprises, religious leaders as they see fit. The provincial committee is some times call a provincial task force for example a Provincial Drought committee is also called the Provincial Drought Taskforce.

A similar organisational structure is set at the district level by the district civil protection In case of drought, the district civil protection unit converts to be district drought committee or task force. The district administrator who is in charge of the district task force also co-opts some stakeholders that are relevant to that particular disaster. Although the institutional

framework for disaster management is clear and comprehensive, the challenge happens on coordination of the management.

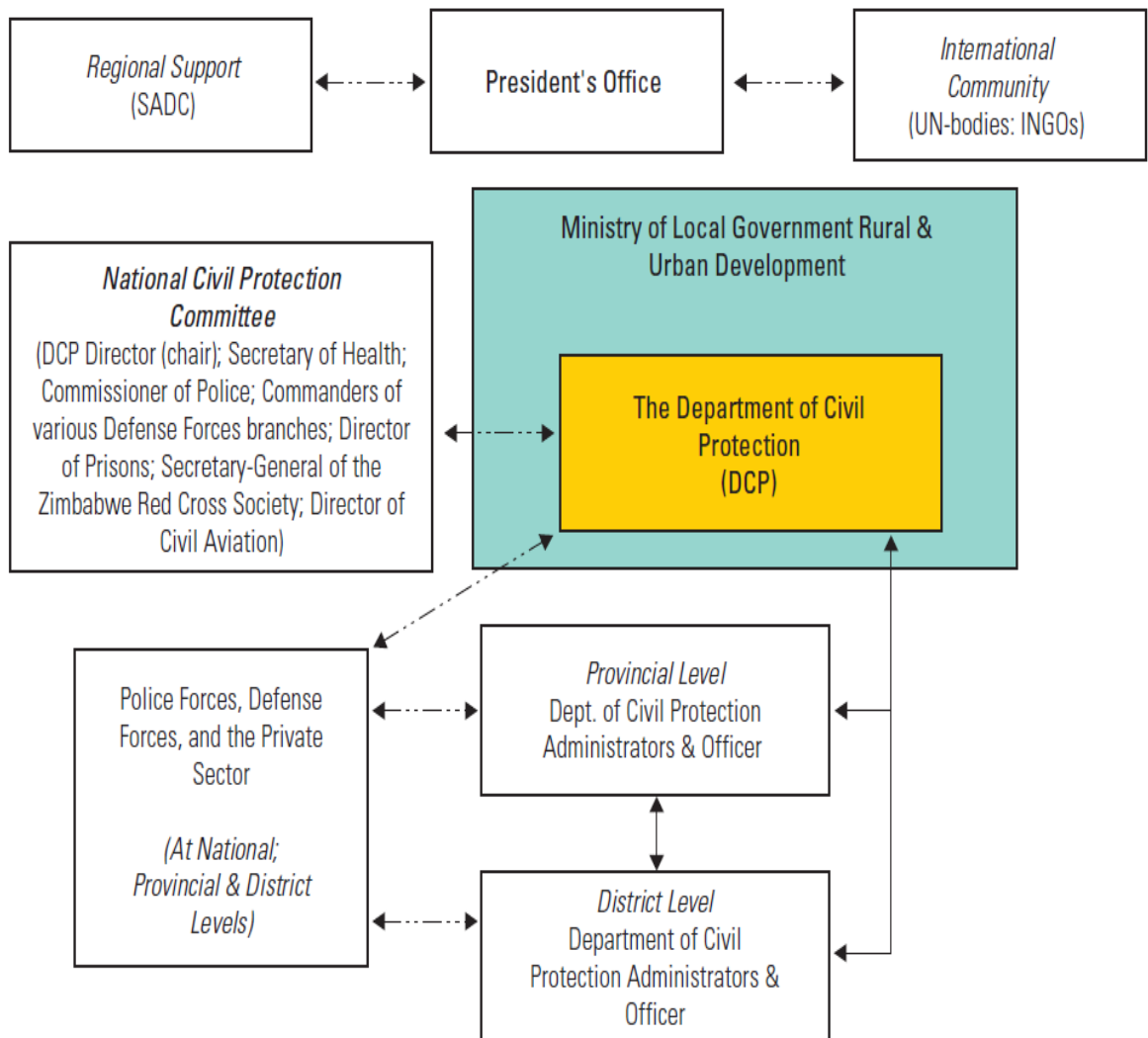


Figure 2.2: Zimbabwe’s disaster management system structure
 Source: Chikoto and Sadiq (2013)

2.4 Unpacking the concept of disaster preparedness

Sutton and Tierney (2006) agree with Kirschenbaum (2002) that at a macro level the concept of disaster preparedness is very rich empirically but poor theoretically. The reason why the disaster preparedness concept seems to be poor theoretically is that there is no consensus on concepts and terminologies around preparedness in general (Swanson and Chermack, 2013). This researcher used disaster management concepts and theories to try to explain disaster preparedness as it is agreed that preparedness is an integral part of disaster risk reduction.

2.4.1 Locating preparedness in the disaster management cycle

Disaster preparedness is an element in the disaster management cycle or continuum therefore the disaster management cycle or continuum is analysed to identify disaster preparedness.

The disaster management continuum has two phases, the pre-disaster stage which is the risk reduction phase and the post-disaster recovery stage as shown in Figure 2.3 below. The two phases have numerous activities, which are namely prevention, mitigation and preparedness and these activities are concerned with reducing disaster. On the other hand, the post-disaster phase has activities like a response, relief, reconstruction, and rehabilitation. Disaster preparedness is under the pre-disaster phase and an integral part of disaster risk reduction. Disaster preparedness activities are those actions taken before a hazard striking to be ready for response and reduce impact. Therefore the disaster management cycle in figure 2.3, preparedness is shown below response. The examples of preparedness in case of drought include food and water stockpiling and water distribution. Preparedness is shown as if it's after mitigation activities. Mitigation implies all activities that are aimed at reducing the impact of the disaster. In practice phases of the disaster, the management continuum can be done concurrently and there is overlap. For example, preparedness can still take place during the response, rehabilitation or recovery phases.

2.4.1.1 Disaster management cycle

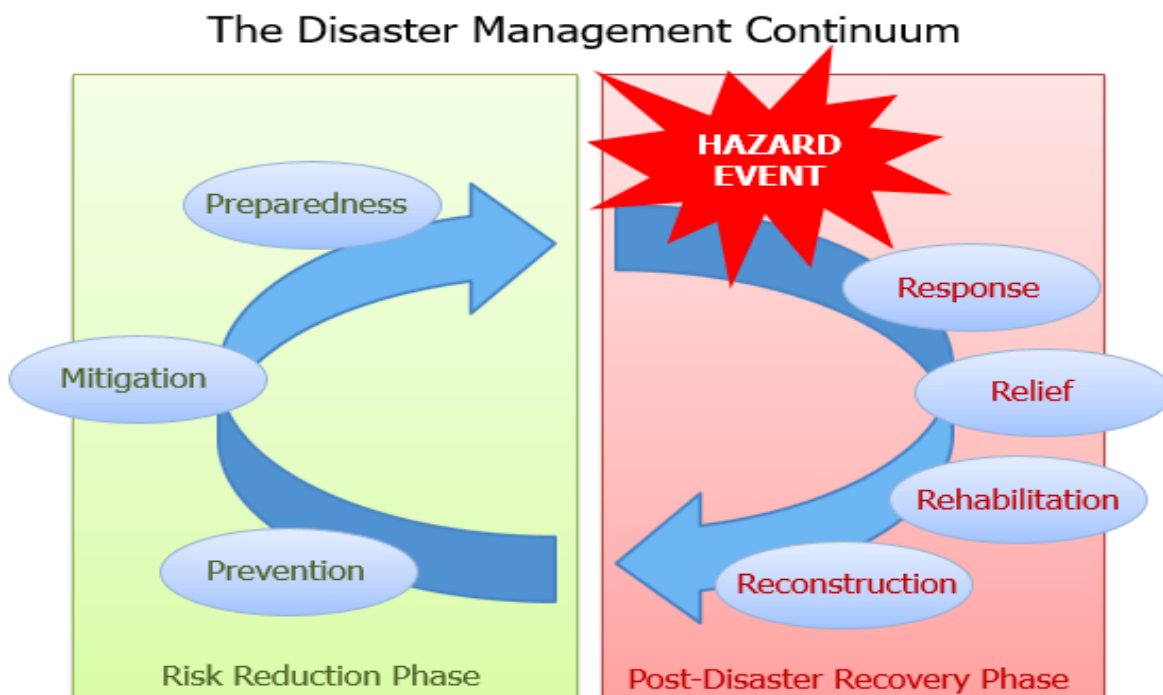


Figure 2.3: Disaster management continuum
Source: Adapted from UNDP (2008)

Other scholars are advocating for a newer version called the disaster management spiral. The disaster management spiral was developed to correct the notion in the traditional disaster management cycle that shows disasters phases as having a start and an end. The spiral tries to show that pre-disaster activities like preparedness can be implemented in the post-disaster stage (UNISDR, 2015). This view illustrated by the disaster management spiral emphasises the concept of building back better. Therefore disaster preparedness can happen anytime within the disaster cycle.

2.4.2 Preparedness in the disaster risk reduction framework

As identified above that preparedness is part of disaster risk reduction it is important to locate it in the DRR framework. The DRR framework summarises the procedure and actions that are undertaken to reduce disaster risk. The framework is shown in Figure 2.4 below. The analysis of the DRR framework is crucial for this study given that disaster preparedness is an important anchor of the disaster risk reduction phase. Without preparedness disaster, the risk reduction phase will be inadequate and weak.

DRR is defined as actions intended at reducing disaster risk through methodical and systematic examination and management of causes of the disaster, to reduce hazards exposure, lessening of the vulnerability of people and property, wise land, environment management, and improving preparedness to hazards. The DRR framework crafted by UNISDR in 2004 and is seen as an international benchmark for DRR (Belle, 2016). The framework illustrates that DRR processes commence with the risk and vulnerability assessment. To adequately assess risk policy frameworks need to be analysed as well. Disaster risk assessment provides information to all other elements of disaster risk reduction. Disaster preparedness actions as part of DRR are essential in defining how the community responds and recovers from disasters. Preparedness is very important as it determines how effective disaster response is and it helps to shape recovery, rehabilitation initiatives.

Another essential element of disaster preparedness is early warning. Early warnings are drawn from information collected such as risk, impact assessments, hazard monitoring and analysis. DRR strategies that include preparedness need to be mainstreamed in sustainable development planning, response planning to build back better as articulated by the SFDRR. In figure 2.4 below it is clear that DRR elements need to be carefully considered for sustainable development. The framework also emphasises the need for political support and commitment from the international to regional and national level. DRR framework also

highlights the role played by the community action in ensuring that disaster risks are reduced.

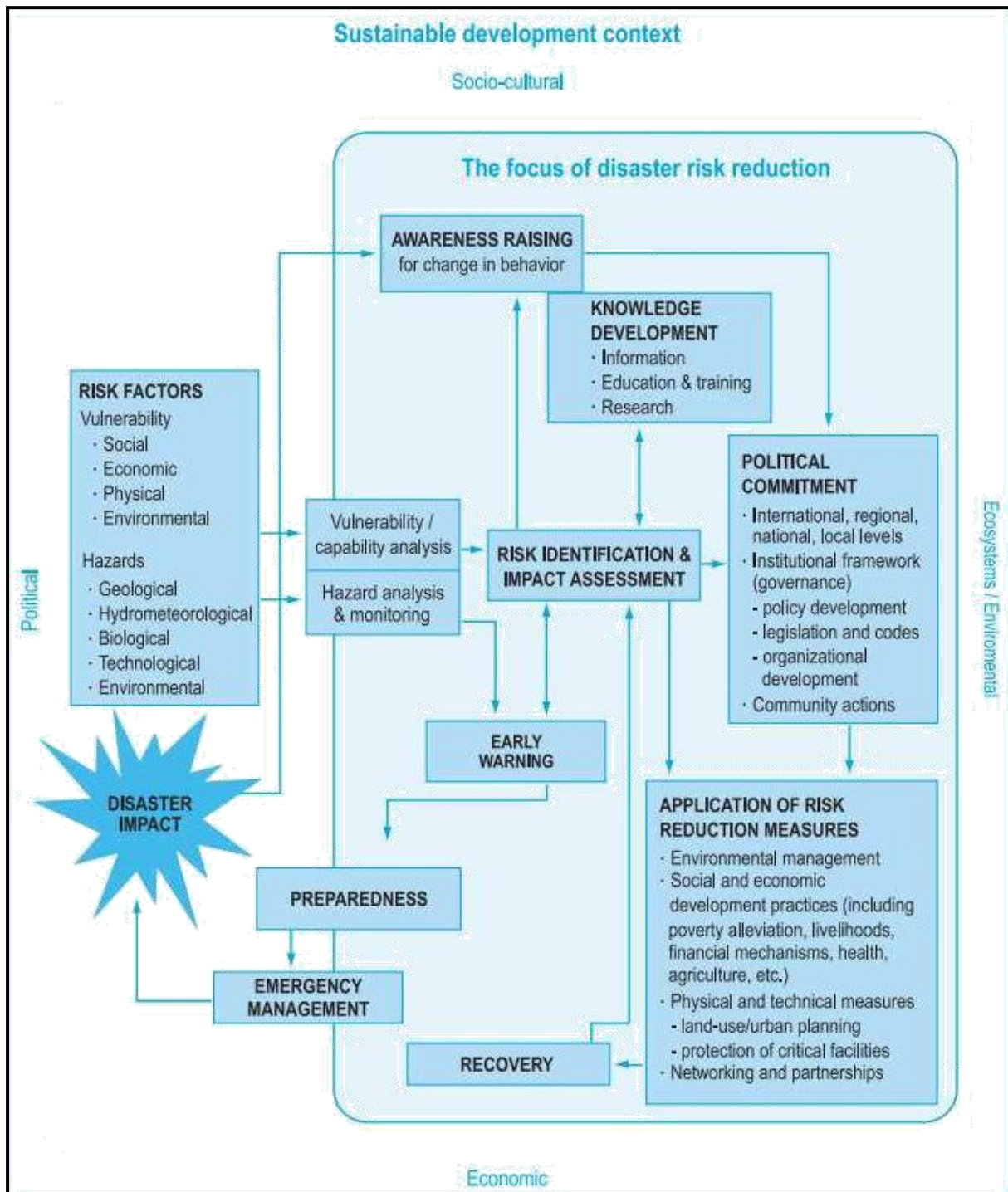


Figure 2.4: Disaster risk reduction framework
Source: UNISDR (2004:15)

2.4.3 Application of the DRR framework to drought risk reduction

The DRR framework showed in Figure 2.4 above is used in combination with the Elements of drought risk reduction developed by the United Nation International Strategy for disaster

risk reduction (UNISDR) and National Drought Management Center at the University of Nebraska-Lincoln (2009), to explain drought risk reduction. The elements of drought risk reduction are policy & governance, risk identification & early warning, awareness & education, mitigation & preparedness.

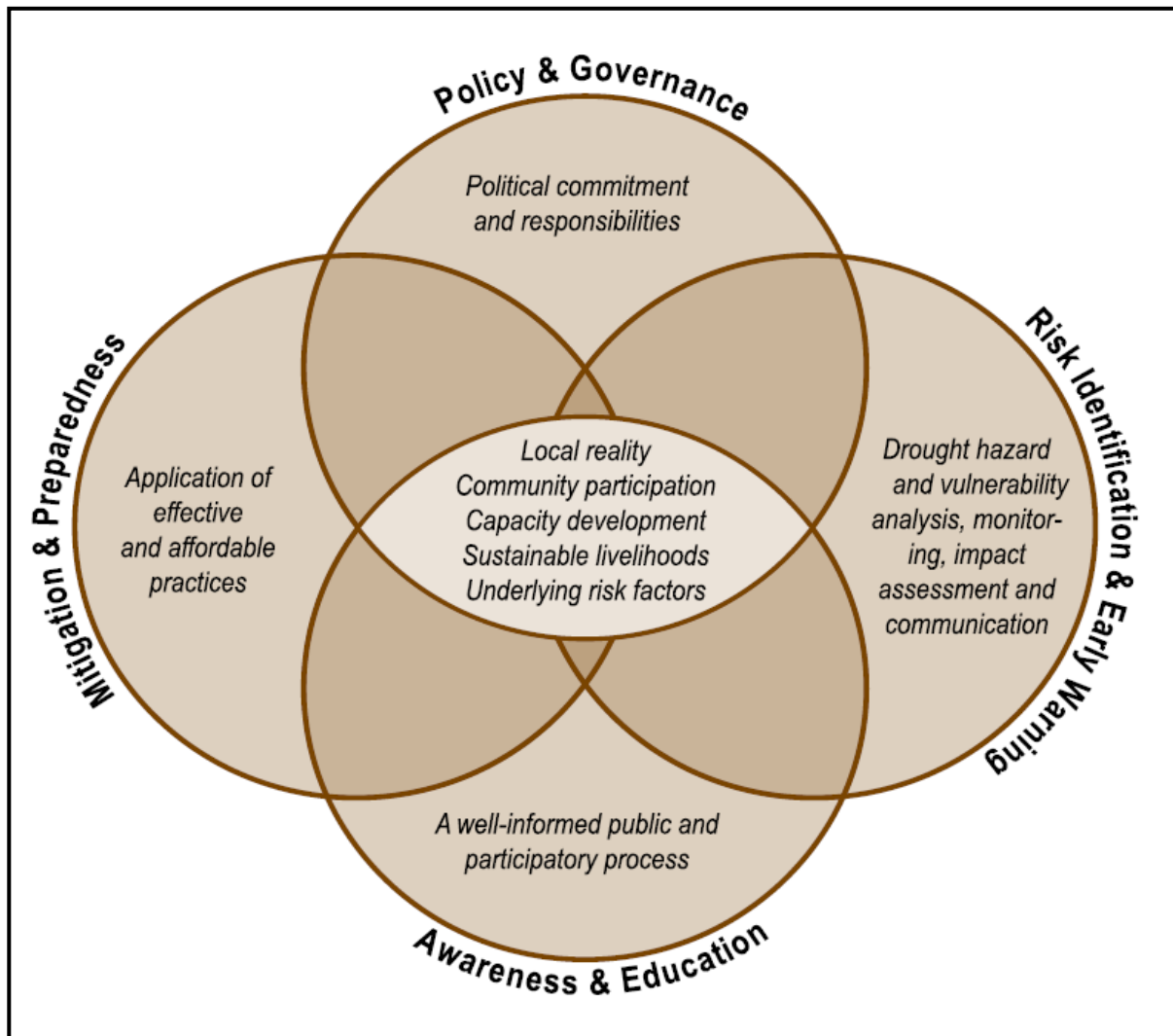


Figure 2.5: Elements of drought risk reduction

Source: ISDR secretariat and National Drought Mitigation Centre, University of Nebraska Lincoln, USA (2009)

2.4.3.1 Risk identification and early warning

The DRR framework in figure 2.4 above showed the importance of risk assessment also the elements of drought risk reduction in Figure 2.5 shows the same. Figure 2.5 goes further to link risk assessment and identification with early warning. Drought hazard and vulnerability assessment are significant actions that assist the community in plotting areas at risk, determine levels of risks identify the most vulnerable communities. It is important to note that drought hazard and vulnerability assessments are continuous processes to monitor the hazard. Hazard monitoring can be achieved by placing surveillance systems to predict

weather and climatic patterns. In the case of Zimbabwe, the Department of Meteorology is the one with the task of monitoring drought hazards events to inform the country to issue periodic alerts and warnings.

2.4.3.2 Awareness and education

Awareness and education are also found in the DRR framework. Awareness and education are important as lack of information and knowledge perpetuate detrimental agricultural and water management practices like environmental degradation which contributes to increased exposure to adverse weather conditions. The elements of drought risk reduction shown in Figure 2.5 emphasize public participation, information sharing as a critical part of drought risk reduction. Community participation in decisions is not only critical but it helps communities to work together and achieve results. Drought is not a household or village issue of concern it affects a wider geographic area hence bottom-up approaches should be encouraged. Indigenous or traditional early warning systems and water conservation methods should be explored and adopted if not detrimental to the environment and are sound scientifically.

2.4.3.3 Mitigation and preparedness

Effective and inexpensive mitigation and preparedness actions for drought risk reduction are a significant part of reducing drought impacts. Such actions do not only reduce the impact but help to build back better. It is vital to implement affordable mitigation and preparedness approaches that can be scaled up easily and viewed as inexpensive by communities. Governments and NGOs tend to promote foreign approaches and devote a lot of time trying to train people and often with some confrontation from communities.

2.4.3.4 Policy and governance

Political and institutional commitments are vital in drought risk reduction interventions. The underlying issue of all drought risk reduction interventions is political and institutional support. Community participation, as well as capacity development, cannot be overemphasised.

At the centre of Figure 2.5 above which is the point of convergence of all the elements necessary for reducing drought risk is a set of important issues. These issues pertain to local context and reality. They include the participation of the community, capacity development agenda, sustainable development discourse. It also outlines the need to review underlying risk factors such as poverty, political and economic stability.

2.5 Disaster preparedness framework

United Nations Development Programme/ Department of Humanitarian Affairs (UNDP/DHA) Disaster Management Training Programme developed a specific framework for disaster preparedness illustrated in Figure 2.6 below (Kent, 1994). The preparedness framework includes nine elements that are vital for understanding disaster preparedness. The elements of disaster preparedness are vulnerability assessment, preparedness planning, preparedness institutional frameworks, disaster preparedness information systems, disaster preparedness resources base, warning systems, disaster response mechanism, disaster public education & training and rehearsals.

The disaster preparedness framework is essential as it helps to explain the concept of disaster preparedness clearly. The different elements of the disaster preparedness framework form the backbone of this research as they will be used to critically analyse preparedness to drought.

Disaster Preparedness Framework		
Vulnerability Assessment	Preparedness Planning Process	Institutional Frameworks
Information System	Resource Base	Warning System
Response Mechanisms	Public Education & Training	Rehearsal

Figure 2.6: Disaster preparedness framework
Source: UNDP/Kent (1994:16)

2.5.1 Application of the disaster preparedness framework to drought

The elements of the disaster preparedness framework shown in Figure 2.6 above are applied drought preparedness.

2.5.1.1 Vulnerability assessment

It is a prerequisite that disaster managers and communities get accurate information about the hazard intensity, exposure, vulnerability and capacity. This information can only be obtained through carrying out assessments. The purpose of assessment is to;

- Identify the main features, occurrence, and potential severity of hazards that a community is facing.
- Identification of geographic areas, communities that are vulnerable and exposed to a particular hazard and how could be affected.
- Assess the capacity of people and other at-risk elements to manage negative impacts that could result due to the hazards.

In case of a drought event, the drought committee or task force obtains drought hazards information from the meteorological department, famine early warning systems network (FEWS Net), and regional forecasts on the severity, areas at risk duration of dry conditions.

2.5.1.2 Planning

Drought planning is very vital particularly for countries such as Zimbabwe, which experiences consistent droughts (Mutowo and Chikodzi, 2014). Droughts have negative effects on surface and under-surface water resources. These effects subsequently affect borehole water capacity, rivers and dam water sources. Droughts also affect economic activities that rely on water and subsequent livelihoods (Tadesse, 2016). Drought planning is therefore very imperative. Plans guides stakeholders on how to prepare and mitigate the negative impacts of droughts (Hayes & Svododa, 2005).

The government has the Zimbabwe National Drought Plan (2017–2025) which identifies and spells the role and responsibilities of government departments and other stakeholders. The Zimbabwe National Drought plan (2017-2025) proposed the embracing of the ten steps process of national drought planning which was advanced by the University of Nebraska. The ten steps provide the framework for drought preparedness and policy development and are explained below

The ten-step drought preparedness planning process

Step 1: Appoint a drought task force

The first stage in drought preparedness planning is the appointment of a task force by either the president at the national level. The responsibility of the drought task force is to supervise and coordinate all processes about the development, implementation and monitoring of the

drought planning process. It is also responsible for ensuring that the planned activities are coordinated during the planning stage and actual implementation stages (Wilhite, 2000). The is often multisectoral in its composition. In Zimbabwe, at the national level the task force is constituted by the President and at provincial and district composition is done by the delegated administrators with guidance from members of the civil protection unit. At both provincial and district levels the drought committees are chaired by development coordinators who are also political representatives.

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

When the task force is well constituted the planning process begins by outlining the purpose and objectives of the plan. It is the first duty of the task force so that they have aims and results clearly defined to avoid ambiguity at lower levels of government. The purpose of the plan and objectives are guided by risk assessment reports such as ZimVAC reports, agriculture crop assessment, dam situation reports. The reports also help the task force to map out vulnerability. The purpose addresses the role, responsibilities and priorities of government and other actors.

Step 3: Seek stakeholder participation and resolve conflict

Droughts and other hazards often bring with them conflict as stakeholders try to scramble for limited resources and ensure that their areas are prioritised. It is therefore vital to identify and map sources of conflict and try to resolve them. For example, limited sources of water can be a big source of conflict at the community level so the task forces must identify the challenges before it too late. There is also a need for prioritisation of issues be they social, economical and environmental issues. Consultations should be done with people affected or at risk of drought and ensure they have a voice.

Step 4: Inventory resources and identify groups at risk

The development of a drought plan needs to cover resources that are needed to prepare and respond to drought. All material, financial and non-material resources should be identified, quantified and assessed of their condition during the planning phase. all resources must be identified and know where they are located. Wilhite (2000) emphasised the need for the identification of natural resources in addition to human and other resources. Natural resources like rivers and other aquatic ecosystems need to be identified as they could contribute to the management of drought risk.

Step 5: Establish and write a drought plan

Writing and a drought plan begins with finding and putting in place multisectoral groups or sub-committees that will work different parts of the drought plan. The groups should be constituted based on their skills and knowledge of the area or topic. Information from drought vulnerability, crops, livestock assessments and hydrological surveys should inform the write-up. Identified resources as explained in the section above also plays a part in the development of a drought plan as it identifies the gaps and areas that need additional resources. The drought plan should include a section on drought monitoring and monitoring of other secondary hazards because when drought strikes an area secondary hazards like veld fires, animal pest and disease may also follow. According to Wilhite (2000), the drought plan should include three main sections which are assessments, monitoring and lastly mitigation and response components.

Step 6: Identify research needs and fill institutional gaps

During the write up of the plan, the teams can identify some gaps in the data and therefore there is a need for the task force to have the resource for further research. The task force should document all the gaps that are found in hazard assessment and vulnerability assessment including resource gaps. Recommendations are then made by the task force to relevant department or stakeholders. Step 6 can be done concurrently with step 4 and 5 as the situation continues to change and for the drought plan to be relevant and well informed.

Step 7: Integrate science and policy

It is often true that sometimes drought plans may ignore science as most of the writers or members of the task force may be politicians only. Science and policy need to be integrated when developing a drought plan. Consultations between policymakers and the science community like agriculture, meteorologists and hydrologist need to take place and be continuous during the plan development.

Step 8: Publicise the drought plan build public alertness and consensus

General public acceptance is vital and the corner stone for implementation of any drought plan. Wilhite (2000) suggests that the task force should solicit public cooperation and buy-in after the plan is developed. It should not be a preserve for the task force members and the educated but it should be translated into community languages and publicised through public media and other community awareness activities. through media and awareness-raising activities.

Step 9: Develop education programmes

Drought is simple the shortage of water hence there it is about conserving and preserving what we have through water management systems. The task force and its members should develop training or public awareness materials and programmes on water, environment and drought in general. The purpose of education programmes should also target elementary schools so that children understand the situation they are in and build a culture of conservation. It also should promote climate-smart strategies, roles and responsibilities of all the members of the community amongst other technical and policy issues. The training programmes should be supported by the government and NGOs especially those around behaviour change strategies.

Step 10: Evaluate and revise drought plan

Like any other plan, a drought plan needs to be evaluated and monitored. The last step pertains to monitoring the effectiveness of the plan. A drought plan should be effective and agile enough give that drought impact is a slow-moving process and its direction is difficult to predict. There is a need for the task force to periodically meet and review the processes and at the end of interventions an evaluation exercise needs to be carried out objectively

In conclusion, steps 1 to 4 of the drought planning process concentrates on establishing a multi-sectoral, competent team that will drive the whole process of drought planning. It is important therefore that the task force works collaboratively and use available resources and skills from each member and department. Step 5 details the procedure of setting up an organogram that is vital for the writing up of the plan. Steps 6 and 7 are about the need to continuously research and research that is important in the planning process. Steps 8 and 9 highlights the importance of testing and trying the drought preparedness plan before it is implemented. The last step 10, clarifies the need to continuously review the plan after each drought as the stakeholders and community would have learnt from preceding drought events (Hayes and Svoboda, 2005).

2.5.1.3 Institutional framework

Institutional frameworks are one of the important elements of the disaster preparedness framework. Institutions are there to support any plan, policy and actions developed for disaster preparedness. The institutional framework should therefore be well-coordinated, horizontally and vertically through operational and agile structures. Figure 2.1 above depicts the structure of the Zimbabwean disaster management system. The framework is clear and well-coordinated from national to district level but more of the top-down approach.

2.5.1.4 Information systems

It is significant to put in place an information department to gather and coordinate sharing of information between government departments and the general population. In Zimbabwe, each Civil Protection Committee (CPC) at each level coordinates the sharing of data and information. Information is received by the CPCs from various departments such as agriculture, meteorology and hydrology and this information is processed and sent out to the public in relevant forms and formats. The CPCs are the mainstay of disaster preparedness and response in Zimbabwe as they do not share information then the whole process of effective planning and response fails.

2.5.1.5 Resource base

Resource base is the collection of all necessary and relevant resources that include financial, human and other material resources that helps in preparing, mitigating and responding to a disaster such as a drought. According to Kent (1992), these resource base may include basic survival items like food, water, shelter and others but it includes logistical, communication resources. Investment in disaster preparedness and response is one good example of a 'no-regrets' approach. 'No regrets' means that resources are sourced to address both short and long-term disaster risks to avert a possible catastrophe from occurring in the first place or exacerbating when triggers have been noted.

In Zimbabwe, drought management resources come from international donors and from the Ministry of Finance and Economic Development (MoFED) which are typically ex-post finances to respond to drought. (World Bank, 2019).

2.5.1.6 Warning system

Authorities are responsible for providing early warning systems to the societies at risk. An early warning system must be able to activate a response before the disaster occurs. Drought is a slow on-set disaster occurrence that takes time to be apparent, it is important therefore to strengthen scientific, technological and traditional warning systems. The researcher suggests that multiple systems need to be used for early warning systems as communities are not homogeneous. Also, it is important to focus use relevant systems so that all the members understand the alerts and able to give feedback or ask questions.

2.5.1.7 Response mechanism

These actions are taken by the government and other NGOs in preparing and responding to a disaster. They are often regarded as response to response to a crisis but the researcher wants to argue that response mechanism should also entail preparedness activities as

preparedness is another form of response. The researcher views preparedness as a pre-response activity and activities like relief assistance are post-response activities. Response mechanism should be coordinated to avoid duplication of and misuse of resources (Kent, 1992). In Zimbabwe humanitarian response is undertaken by the Humanitarian Country Team (HCT). Their role is to mobilise resources and ensures they follow the plan in response distributions. At the local level, the district drought committee/task force, which is the local CPU, is accountable for managing the response actions. Each organisation or department is given an operational area to circumvent duplication and activities are reported utilizing an agreed set-up that reports to the national level.

2.5.1.8 Education, communication and awareness

Effective communication is paramount when many people are involved especially in a situation like a drought disaster. Education is also important to build a culture of disaster risk reduction as people will be aware of the consequences of their actions, the possible impact of the hazards and the ways of managing risks. Education and awareness should be the duty of every stakeholder in the community. Education materials should be standardised to achieve similar outcome across the community. Knowledge and skills of preparing and mitigating against disaster impacts should be shared widely (Hayes and Svoboda, 2005).

The primary role of universities and colleges is to educate and research so these institutions must participate in all the interventions that relate to drought preparedness to be relevant in their research and training. Awareness on the other hand should be achieved through public and social media.

2.5.1.9 Rehearsal

Rehearsals are also vital for disaster preparedness planning processes. Rehearsals help planned activities, strategies to be tried and tested. This ensures that all stakeholders and departments can relate when an actual event occurs. Rehearsal activities are critical as also help participants to recognise gaps that require attention (Kent, 1992). This researcher however argues that rehearsals are not easy to do for disasters like drought which are slow on-set and difficult to determine in terms of scope, dimension and direction. The only thing the drought task force they can do is to do scenario planning that is similar to the planning process that is outlined above in the 10-steps planning.

2.6 Chapter summary

Chapter examined and explored drought and preparedness legal and theoretical frameworks, which underpins drought preparedness practice. This chapter shows that there

are tight links between the global frameworks, African and Zimbabwean frameworks and perspectives. The legal frameworks that underpin drought preparedness in Zimbabwe were reviewed especially policy laws and strategies relating to disaster management. The process of reviewing the legal and theoretical frameworks put forward by other scholars enabled the researcher to deepen his understanding of drought frameworks and theories.

CHAPTER THREE: REVIEW OF RELATED LITERATE

3.1 Introduction

Chapter three reviews the scholarly literature and research work-related or similar topic of drought preparedness. A literature review is important and assists clarify the research question. It also helps to ensure that the study focuses on areas that are not researched by previous scholars and researchers. It also helps the researcher to have more understanding of the topic under study hence it is important in the learning process of the investigator. Literature review shows readers of the research document that the researcher had an adequate understanding of the topic and subject (Denney & Tewksbury, 2012). Through the documentary review, the researcher benefited from a better understanding. It is also important for the literature review chapter to be placed after the introduction and legislative and theoretical framework but before the methodology. This allowed the researcher to discover and deepen understanding of the subject under research (Hofstee, 2006). Placing the literature review chapter here also helped to ensure that the research methodology and analysis are founded on other scholars recommendations.

Firstly, drought is defined and concepts elucidated showing drought complexity in terms of different understanding and its categories. Drought progression and its dimensions are also discussed showing that the same drought hazard can mean different drought in different areas. The researcher went further to show the existence of droughts and to show why it was important to undertake this research. Evidence of exitance of drought its impacts, historical trends is explored starting with global trends to Zimbabwe country level. The chapter also focuses on the concept of disaster preparedness and drought preparedness and understanding different understanding, challenges of drought preparedness as highlighted by other researchers.

3.2 Drought: A natural part of climate

Drought is rightly described as an arbitrary natural climatic event, that happens almost everywhere on the globe. It is also a multifaceted and not easily understood climactic event and at the same time affecting many people compared to other natural hazards (Wilhite, 1999; WMO, 2019). Drought is defined as the reduction of precipitation occurring naturally over a long time, typically a season or more, and is associated with other climatic events like high winds, high temperatures, and low humidity that can worsen the event (WMO, 2019).

Climatic and weather conditions like high temperatures, high winds, and others, combined with below-normal precipitation for a long time can activate or exacerbate drought events. Rathore (2005) concluded that droughts are produced by dry weather happening over a long

period resulting from inadequate rainfall triggering soil moisture exhaustion, lessening of on surface or river flows, and underground water sources. However, drought is not only connected with high temperatures. Van Lanen et al. (2007) argued that drought is mainly generated by low rainfall and high evaporation rates. In cold climatic areas where the temperature goes below zero lack of rainfall can cause winter droughts. This further shows that drought is not only a hot and dry regions phenomena but it occurs everywhere even in cold regions. Drought is therefore related more to precipitation than anything. Therefore, drought can be defined as insufficiency of rainfall or precipitation that happens over a lengthy period, for example, a season that causes water shortages or as IPCC (2012:57) sums it “*a period of abnormally dry weather long enough to cause a serious hydrological imbalance*”.

Drought hazard is quite different from other natural hazards in several ways;

- **Definition:** Drought has no one agreed-upon definition, this makes it problematic to reach an agreement of its occurrence and severity. Drought means different things to different sectors. Lack of an agreed definition does not only create challenges in managing it but also creates confusion around its existence. These challenges let to Wilhite (1999) to conclude that difficulties in defining drought are caused by different impacts and severity in different regions.
- **Timeframe:** Drought is a “*creeping phenomenon*” it is a slow onset and this makes it a challenge to define its head or tail (Wilhite & Glantz, 1985). Other hazards like earthquakes, hurricanes are rapid on-set scientifically it is possible to determine its start and end. On the other hand, drought has no recognisable start and it can continue for a long time without people noticing or taking action. Sometimes people trigger drought mitigation activities then cyclonic rains come to change the situation. Even with the sophisticated technology droughts are difficult to predict and this affects developing countries like Zimbabwe to plan timeously.
- **Impacts:** The effects of drought on water availability does not happen instantaneously. It depends on several factors like environment, ground hydrological makeup and also impact and severity to drought cannot easily be delineated by time or area.

3.3 Components of drought as a risk

Drought has both social and natural dimensions to it according to (Wilhite, 2000). The social factors include those that are linked to the vulnerability natural dimension which is the actual hazard of the drought natural event as shown in Figure 3.1 below. So drought risk at any

point and location results from the natural event which lack of adequate rainfall or precipitation which is the hazard and meet vulnerable community such as those without an alternative source of water, food and incomes dependent of rainfed agriculture. Therefore the meteorological drought can be seen as a natural event occurring as a result of changes and disruptions in the global air circulation. In Zimbabwe, drought events are mainly caused by a weather phenomenon called El Niño. El Niño-Southern Oscillation (ENSO) disturbs Zimbabwe’s rainfall patterns during the first half of the year hence it is responsible for below-normal rainfall during that time of the year. Vulnerability on the other hand results from social factors and conditions that include social status, behaviours, demographics and population characteristics. It is important to note that underlying causes of vulnerability such as poverty weakens the individuals or community’s adaptive and absorptive capacities to deal with droughts. FAO (2008), asserted that communities located in dry land regions are among the poorest in the world. Such communities endure food insecurity year after year due to land degradation ensuing from rainfall inconsistency. It is important to underscore that social factors differ from one region to another region and from time to time.

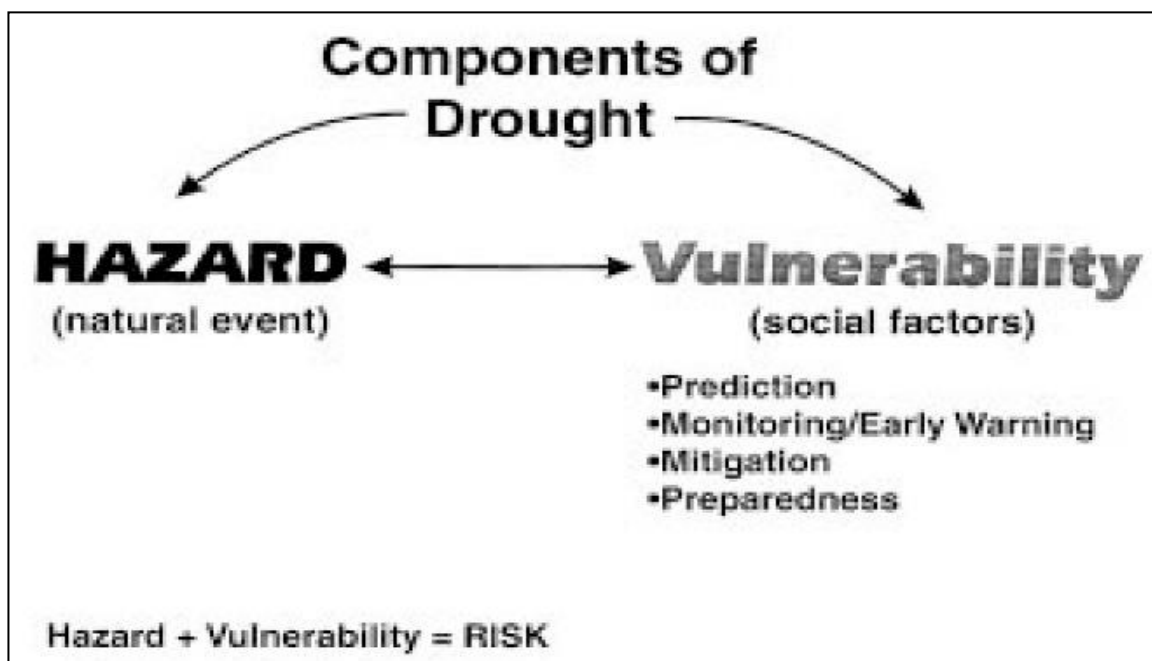


Figure 3.1: Components of drought as a risk
Source: Wilhite (2000)

The impact of a drought event does not only depends on the severity of the dry weather and shortage of precipitation but it also depends on the characteristics of the community including the state of preparedness information and resources they have. The level of preparedness to deal with drought is arguable one of the important capacity element that the

community should have. They may have a lot of resources and skills but if there is no plan for preparedness, resources could be wasted. Therefore, drought risk can be viewed as:

Drought Risk = Hazard (Natural event) x Vulnerability (social factors)

Capacity (including preparedness)

Preparedness, therefore, speaks to having a clear plan on how to make resources available achieve its intended goal of effective response. Preparedness is therefore crucial as it provides and anchors all capacities.

3.4 Drought categories

As stated above in the components of drought, defining drought depends on the shortage of water in the whole hydrological cycle, impact on the environment and the whole society. Therefore droughts are classified based on their impact areas and are commonly classified into meteorological drought, agricultural drought, hydrological drought, and socio-economic drought ((Wilhite, 2000). These can be viewed as classifications or dimensions of having inadequate precipitation (Sivakumar et al., 2011). Drought as a slow on set disaster progresses from one class to another class Figure 3.2 below shows the categories and progression of drought over time.

3.4.1 Meteorological drought

Meteorological drought refers to a situation where there is a precipitation deficit over a specified period. It is defined as dryness degree over a specified period like 60% of precipitation three months in a different location. Meteorological drought is therefore simple precipitation deficiency measured in a given geographic area and at a given time. It is stated in absolute amounts. It is also stated as the degree of dryness of an area compared with the normal rainfall amounts. It is a prolonged absence of rainfall, or increase in temperature that decreases humidity, causing an increase in the rate of evapotranspiration. Local atmospheric conditions are the major contributors to meteorological drought.

3.4.2 Hydrological drought

Hydrological drought is "*insufficiencies in surface and subsurface water sources above-normal conditions at various times of a season*" (UNISDR, 2009:23). It is when the when underground and surface water is below average compared to the average conditions and time. It is evidenced by the decrease in water in aquatic condition. Wlihite (2000) defined hydrological drought as the lessening of water amounts reservoirs such as ponds rivers, streams, dams and lakes. It is the effects of prolonged dry spell caused by lack o rainfall on

water sources like dams, rivers, ponds, aquifers and other aquatic systems. It is important to note that surface and underground water situation is not determined by only precipitation, but there are several issues like irrigations, increase in water users can contribute to the reduction of water. In the study area, other uses of water include irrigation schemes, the recent increase in the number of users like setting up of Lupane University camps in the area. Main water sources that support these activities may cause a decrease in surface and underground water.

Drought and aridity are two different conditions. Aridity refers to the dry condition caused by or attributed to long-term climatic condition. On the other hand, drought is a temporary dry condition triggered by lengthy water deficiency (Maliva & Missimer, 2012). It is also important to note that drought can affect an arid region.

3.4.3 Agricultural drought

Agricultural drought is referred to as a lack of soil water or moisture essential to support crop and forage growth (UNISDR, 2007). Agricultural drought can be viewed as the impact of both meteorological and hydrological drought of agricultural activities be it crops or livestock. Impacts of agricultural drought can be seen in the form of crop wilting, livestock diseases and mortality, reduction of crop yields. In Zimbabwe, the agricultural drought is more pronounced in agro-ecological regions, IV and V. This is where the study area is located and is normally associated with crop failure, drying of pastures.

However, agricultural drought is similar to hydrological drought in that it can not be attributed to lack of rainfall, several issues contribute to agricultural droughts. Sivakumar et al. (2010) further claimed that the decrease of soil moisture through infiltration and other processes can not be fully attributed to agricultural droughts. Sivakumar et al (2010) stated that slopes, soil types antecedent moisture conditions also contribute to infiltration rates. Daluka ward is located in sandy soils and slopy areas make it hard for moisture to sustain and promote crop growth.

3.4.4 Socio-economic drought

Socio-economic drought is unlike drought types because it shows the association between demand and supply water and other commodities that depend on water such as fodder for livestock water for power generation and other social and economic activities that depend on water. Gornall et al (2010), stated that disequilibrium between demand and supply at the community level tends to affect its social and economic needs (Gornall et al., 2010). Some of the social and economic activities depend on water. So socio-economic drought is related to activities that are affected when there is reduced rainfall. When society's demand for

water becomes higher than what is available in the environment and local weather can support it (Maliva & Missimer, 2012). In Daluka ward socio-economic drought displays itself in the shortage of drinking water, fishing activities, reduction in construction activities, lack of pastures amongst others.

National Drought Mitigation Centre (NDMC) shows the relationship between categories of droughts and time as shown in Figure 3.2 below.

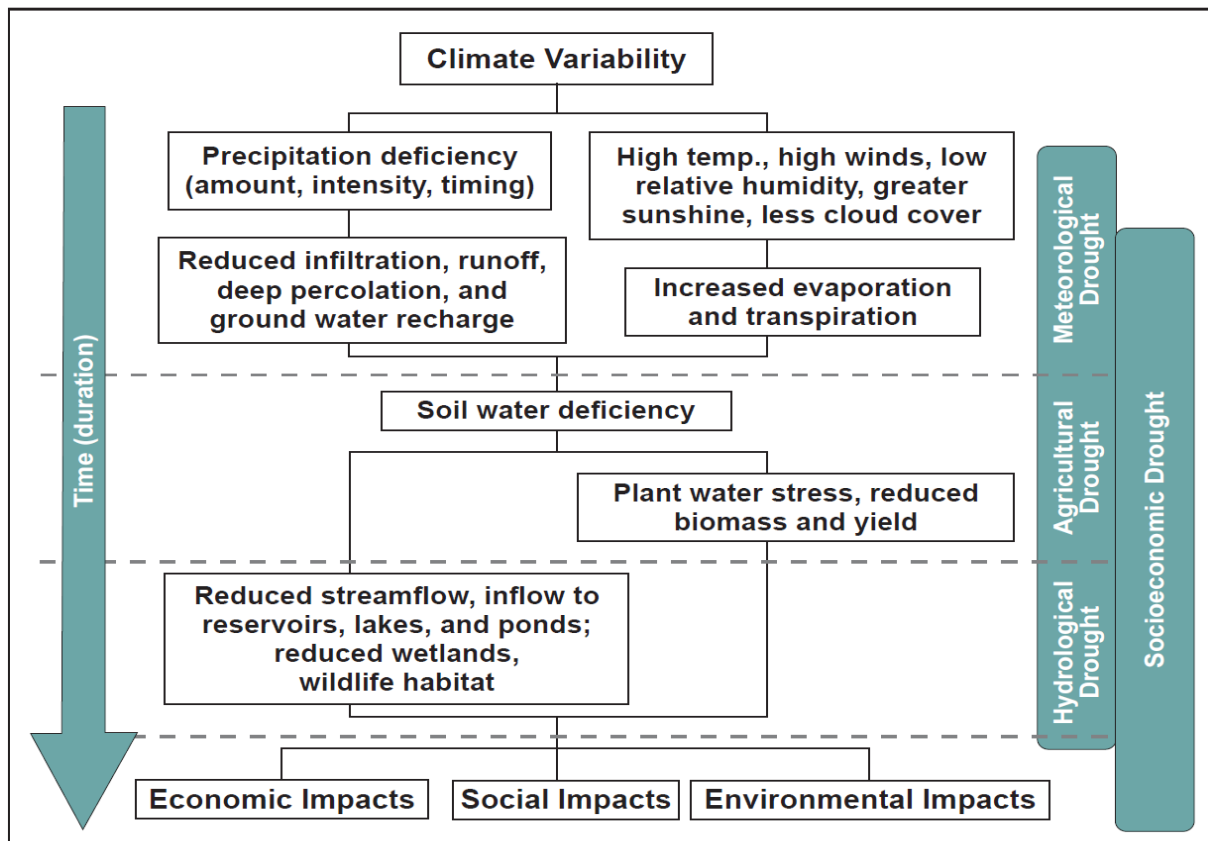


Figure 3.2: Relationship between categories of drought
Source: Jordaan (2012)

Figure 3.3 below illustrates the relationship between different types of drought. Agriculture, socio-economic and hydrological droughts happen less often compared to meteorological. This is so because meteorological drought is mainly related to lack of precipitation and whilst all other droughts its impacts are linked to subsurface and surface water availability.

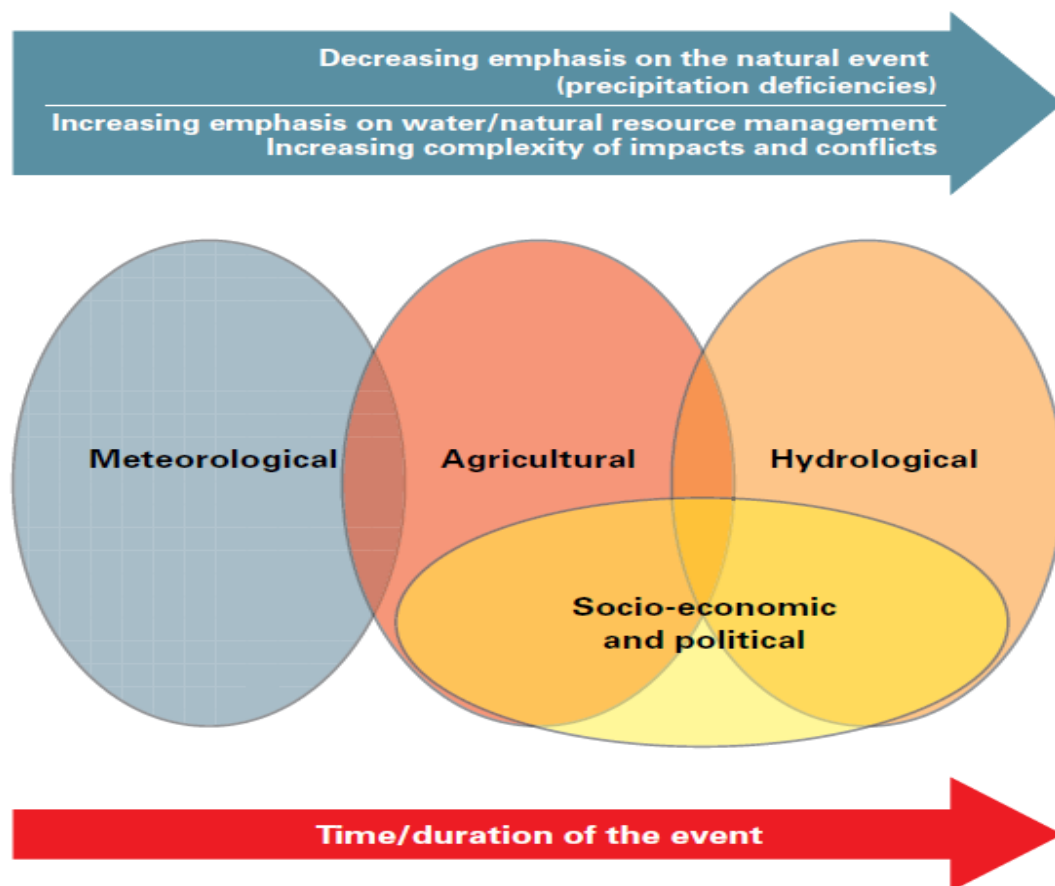


Figure 3.3: Interrelationship between categories of droughts

Source: Adapted from National Drought Mitigation Centre University of Nebraska–Lincoln, USA (WMO, 2006)

According to WMO (2006), lack of rainfall takes several weeks for moisture deficiencies to start being visible and to result in the crop, pasture stress. It also takes more time months or years for lack of rainfall to affect water reservoirs like rivers, dams, lakes and even ground water.

The extended drought situations, hydrological, agricultural, and socioeconomic drought may happen with related impacts in the community. During the drought period, it is not only the water inflows to renew subsurface and surface water sources that upsurge but also the demand for water resources normally surges. This is because drought may coincide with high temperatures resulting in a subsequent increase in the need for water for livestock and

crops. As shown in Figure 3.3 above, the direct association between the categories of drought and rainfall shortages is reduced because water availability in subsurface systems surface and is determined by how these systems are run by society.

3.5 Measuring drought

Several droughts measuring tools have been advanced by scientists to describe the start of the drought, its severity, ending. These tools are commonly known as drought indices. Drought indices need wide data and investigation of river flow, rainfall, snowpack, etc. The analysis is undertaken over different times to generate a full picture of the region under enquiry. A drought index is a single value that is construed on a scale from abnormally dry, average, and abnormally wet condition. Scholars have put the three most common indices advanced by the researcher namely; the Standard Precipitation Index (SPI), Palmer Drought Severity Index (PDSI), and Crop Moisture Index (CMI) and these are described briefly below.

3.5.1 The Standard Precipitation Index (SPI)

The Standard Precipitation Index (SPI) is one of the commonly used indexes; it is calculated by comparing the actual rainfall with the probability of precipitation for a different time. Calculation of SPI is based on rainfall only; it excludes other factors that may contribute to drought. The SPI is suitable for agriculture and hydrological sectors for preparation or making decisions.

SPI can be negative and if it is negative over time, a drought event will be happening, drought will be more intense if the SPI is -1.0 or less. Conversely, if the SPI is positive, the drought event would have ended. Each drought event can be estimated in terms of beginning and ending time (Hayes et al., 2011).

3.5.2 Palmer Drought Severity Index (PDSI)

The Palmer Drought Severity Index (PDSI) classifies different stages of dryness and wetness in a particular area or region. PDSI is estimated using ground temperature and rainfall data including soil moisture content refers to the Available Water Content (AWC) of the soil.

This kind of index is not very relevant and useful in regions or areas that are mountainous because in those areas weather and climatic conditions fluctuate. Mountainous areas often face extreme climatic and thus skew the data and distort the calculation of the index (Alley, 1984).

3.5.3 Crop Moisture Index (CMI)

Crop Moisture Index (CMI) is developed from PDSI. The CMI computes the moisture supply to crops and it is based on the short period. When developing the CMI, crops need to be monitored in terms of their conditions weekly.

CMI is very useful for monitoring moisture for crop condition in the short term, it is not useful for monitoring long term conditions on crops. The other disadvantage of using the CMI is that it is largely determined by short-term fluctuations and thus offers disingenuous information for forecasting and measuring drought in the long term.

3.6 Historical perspective of droughts

3.6.1 Global drought trends

It seems drought has been occurring since time immemorial. Dai (2011), stated that proxy data from history, tree-rings demonstrate that droughts have been occurring since many years ago. It also shows that droughts have been occurring in almost all the regions of the earth world in the previous millennium. Indications from history confirm that early communities were very susceptible to climatic events and climate. These negative climatic events were sometimes catastrophic and may have resulted in many communities collapsing. A global evaluation is done by Dai (2011) on aridity and drought exhibited that many large-scale droughts happened in the past 1,000 years everywhere in the world. Additionally, the Centre for Research on the Epidemiology of Disasters (CRED) recorded that previous drought has brought with themselves some major negative impact on humanity if compared to other natural hazards. What is also profound about droughts is that affects all world regions and more than fifty per cent of the global populace is vulnerable to drought annually (Wilhite, 2000). It is projected between 1900 and 2013 there were about 642 drought events around the world and they killed approximately twelve million people. Droughts also affected more than two billion people and created economic harm to more than 135 billion United State Dollars (EM-DAT, 2014).

3.6.2 Drought trends in Africa

Africa has a history of droughts and rainfall variations. The worst droughts were documented in the 1910s mostly in regions of East and West Africa (FAO, 1996). Severe droughts happened in Africa in the 1950s and between 1970 to 1980. Extreme droughts have happened in the Sahel region. Therefore droughts are common in Africa. The scrutiny of the drought events in African countries shows that they are more inclined to the North-central and Eastern regions of Africa. The map below displays droughts year tallies per country between 1970 and 2004.

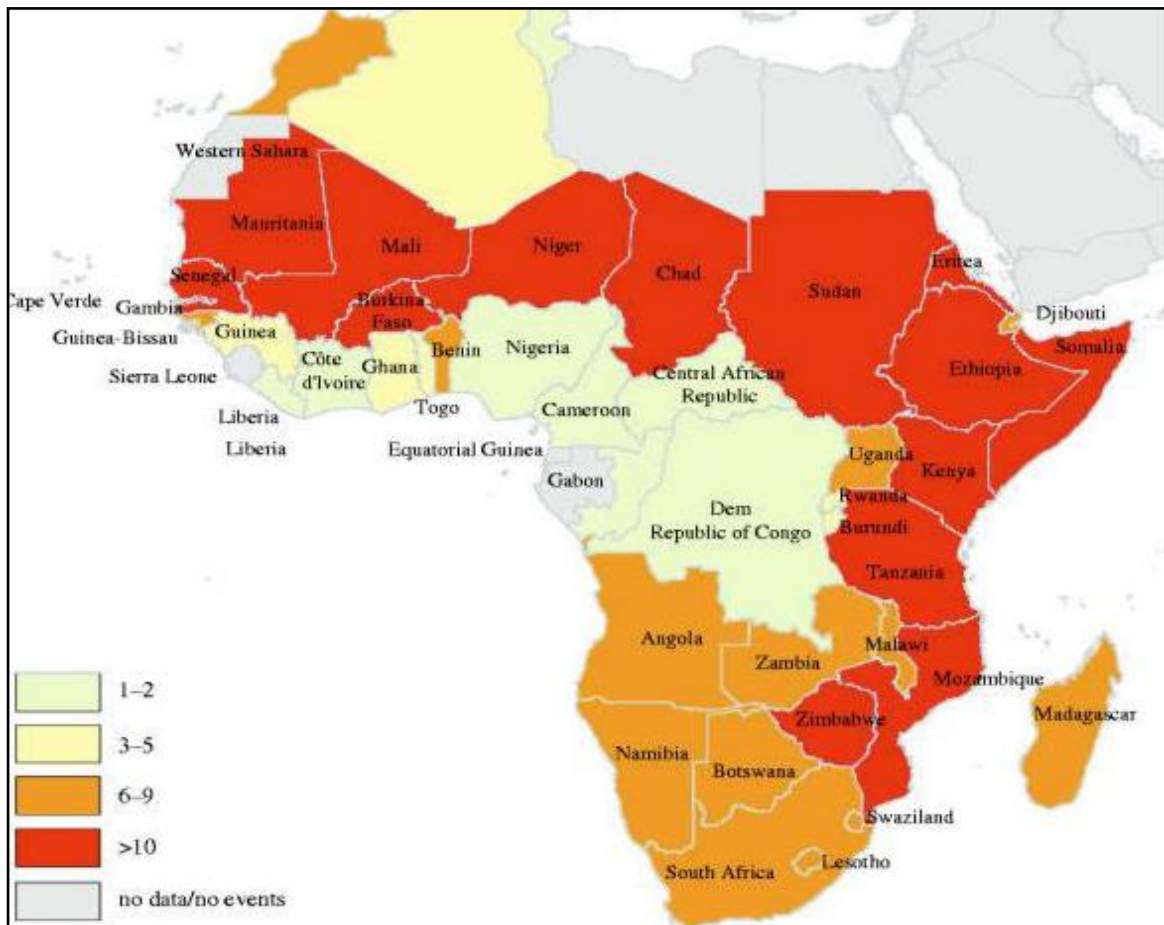


Figure 3.4 Drought episodes in Africa between 1970 and 2004

Source: OFDA/CRED (2005)

The heavy reliance on rain-fed agriculture makes Africa very prone to droughts and any change in climate conditions that result in lack, delay of rain or high temperatures results in water stress (Toulmin, 2007). Although the whole continent suffers from some form of droughts due to climatic conditions like other parts of the world, some regions and countries suffer more than others. This illustrates that drought is not only a lack of rainfall but is a combination of natural hazard and other social conditions as illustrated in Chapter two.

3.6.3 Drought trends in Zimbabwe

In the case of Zimbabwe droughts, are a more common and very popular natural climatic hazard blamed for most of the challenges facing the rural population. Sometimes the blame is not fair but the increased frequency of droughts makes it easy to relate it to any challenge. Droughts in Zimbabwe, are linked to warm El-Nino-Southern Oscillation (ENSO) in the Pacific Ocean (Stringer et al., 2009). Figure 3.5 below displays drought events in seven SADC countries from 1960 to 2016. The countries which are the most affected were

Mozambique, Zimbabwe, Madagascar, and Malawi. According to Guha-Sapir et al. (2016), droughts occur in these four most affected countries almost every after years.

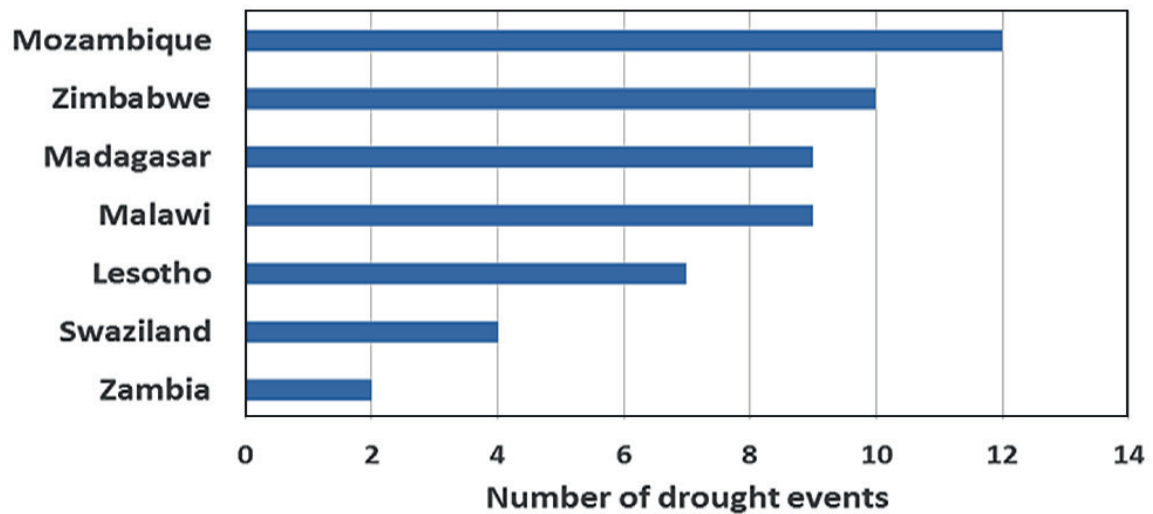


Figure 3.5: Number of drought events in some SADC countries from 1960 to 2016

Source: Author construction from EM-DAT (Guha-Sapir et al., 2017)

Droughts in Zimbabwe are widespread in agro-ecological region IV and V, which spread from Matabeleland regions to Masvingo provinces (Nyakudya & Stroosnijder, 2011). In 1960 Zimbabwe was divided into five agro-ecological regions. These regions are created using the spatial distribution of precipitation (Vincent & Thomas, 1961). Region 1, 2, and 3 are better for agriculture owing to satisfactory rainfall. The entire country is frequently suffering mid-season and seasonal droughts even in those regions, that were previously regarded as having the best soils and rainfall conditions.

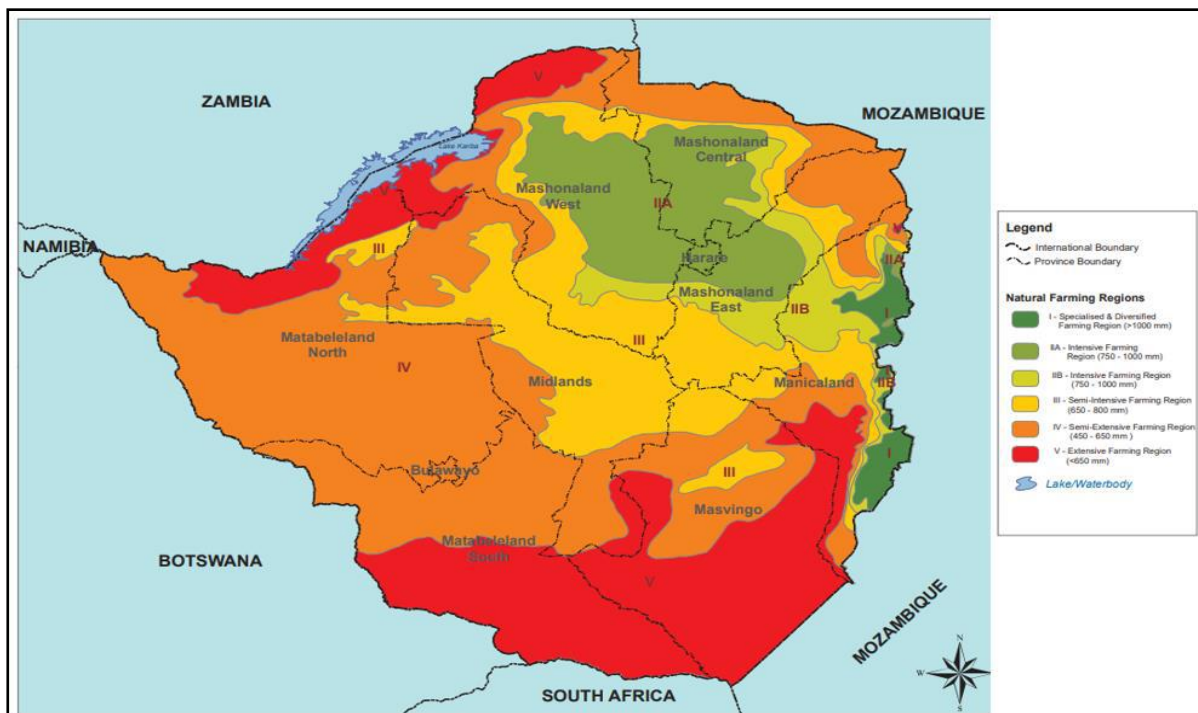


Figure 3.6: Zimbabwe's Natural farming regions - Region 4 & 5 are drought-prone

Source: OCHA (2002)

Zimbabwe has suffered from its fair portion of droughts and the 1991/2 droughts are viewed as the worst droughts in decades (Borsotti, 1993). The 1991/92 drought resulted in the suffering of 5.6 million people across Zimbabwe. It also resulted in crop failure of more than 92% in communal areas (Thompson, 1993).

Table 3.1: Zimbabwean droughts between 1950 and 2020

Drought Grade	Extreme Drought	Severe Drought	Mild Drought
Drought Years	1983/4, 1992/3	1968, 1973, 1982, 2004	1951/2, 1960/1, 1964/5, 1965/6, 1970/1, 1984/5, 1987/8, 1991/2, 1995/6, 2002/3, 2005/6, 2007/8, 2009/10, 2016/17, 2018/18, 2019/20
Total	2	4	16
	3.3%	6.7%	26.7%

Source: Modified from Nangombe (2014)

Table 3.1 above demonstrates different drought categories based on severity between 1950 and 2013. Droughts in Zimbabwe like in many other countries have turned out to be more frequent, according to WMO (2019), Zimbabwe suffered only three droughts between 1960 and 1980. However, the situation changed between 1981 and 2001 and the country suffered more than seven droughts. Zimbabwe together with other Southern African countries

suffered the worst impactful droughts in 1982 and 2008 droughts. In each of the droughts, 94% of the population was affected.

3.7 Causes of drought

Drought is primarily caused by instabilities in the atmospheric movement causing rainfall shortage. The disturbances in the atmospheric pressure result in high-pressure and anticyclonic pressure over the region for a long time causing subsiding air and therefore drought (Wilhite, 2000; Dube, 2008). The 2001/2002 drought in Zimbabwe was related to such subtropical anticyclonic activities.

3.7.1 Climate variability

Climate variability is defined as the varying of climatic parameters over a long term time in a particular region climatic means of a particular region. These climatic variations from oceanic and atmospheric circulation are a result of differential heating of the sun (Ramamasy & Baas, 2007).

One of the main drivers of drought in Zimbabwe is climate variability (Haile, 2005). Climate variability is defined as varying climatic conditions from their long-term average caused by oceanic and atmospheric circulation resulting from sun heat on earth (Ramamasy & Baas, 2007). This view was reinforced by Wilhite (2000) who reiterated that meteorological drought is triggered by disturbances that happen in the atmosphere as it is part of the climatic occurrence. In Sub-Saharan Africa, El Nino- Southern Oscillation ENSO), Sea Surface Temperatures (SSTs), and land surface-atmosphere are typically responsible for droughts. The weather systems in the pacific causes warm water to attack cold water on the coast of South America resulting in droughts in Australia, Brazil, India, and Africa (Reed, 1997). High-pressure systems and anticyclones in a region for a long time can result in an alteration of airflow and drought. Thus the reason why the 2001/2002 drought in Zimbabwe was due to a subtropical anticyclone. However, drought is not only triggered by natural climatic phenomena, human activities like environmental disturbances are also to blame.

3.7.2 Climate change

Climate change is defined as the modification in the condition of climate based on the fluctuations in the mean of its components and properties that continue for a long period of at least three decades or longer (IPCC, 2014). Climate change is ascribed to natural weather variability and mostly anthropogenic factors discussed below. IPCC (2014), stated that the main causes of climate change are global warming produced by the release of greenhouse gases, carbon dioxide (CO₂), methane, and other greenhouse gases. Scientists attribute the

warmer African climate equated to 100 years ago to greenhouse gases and suggest that a warmer climate is likely to continue (Hulme et al., 2001). Warmer temperature also increases rates of evaporation and evapotranspiration causing a rapid loss of soil moisture contingent on the type of soil and other weather conditions leading to droughts.

3.7.3 Anthropogenic factors

Anthropogenic effects on the environment and ecosystems also contribute to immense drought occurrences internationally (Zeng, 2003). Adjustment in the natural environment especially negative ones like deforestation, improper land use, desertification, overgrazing and destruction of ecosystems has been increasing. These human activities are the ones that contribute to droughts. Environmental modification happening on land surfaces because of anthropogenic activities has negative impacts on the hydrological processes in general. The population is growing to cause an increase in demand for food. In trying to respond to food requirements through increasing production, irrigation schemes are set up resulting in the increased withdrawal of water.

Greenhouse gas emission is one of the human activities that cause climate change and subsequent contribution to disasters such as droughts. Industrial activities cause pollution, agricultural activities like livestock farming also contribute to the growing emission of carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄). Deforestation interrupts carbon sequestration processes as vegetation would have been removed that would have sometimes sunk carbon. In the Lupane district, one of the economic activity that is related to deforestation is timber logging. Harvesting timber without replacing it destroys the important carbon sinks that are necessary to reduce carbon emissions.

3.8 Impact of drought in Zimbabwe

According to Glantz (1987), drought is one of the principal challenges to achieving sustainable development in Sub-Saharan African countries like Zimbabwe. Droughts have grave social, environmental, and economic effects. In Zimbabwe drought has caused repeated food shortages that necessitate diversion of millions of United States dollars to prevent loss of life (Wilhite, 2000). Drought effects in Zimbabwe result in water scarcities affecting agriculture production, domestic purposes and industrial use, livestock loss, vegetation, and growth of toxic alga. Reduction and of rural livelihoods such as crop and livestock caused by drought exposes communities to malnutrition and starvation. Crop failure and losses affect the most vulnerable members of the community such as children, the elderly headed, and those families that are affected by HIV and AIDS (Department of Civil Protection, 2012). Droughts hazards have also affected important ecosystems such as

wetlands, forests and grasslands by altering their ecological and hydrological systems. Other secondary effects of drought such as veld fire also result in the reduction of biodiversity and disrupt human life.

According to the National, Drought Mitigation Center (NDMC), (2016) droughts impacts are categorised into three main groups which are namely; social, economic, and environmental. These impacts of drought are important to consider whenever drought planning is undertaken.

3.8.1 Economic impacts

The social and economic impacts of droughts in a community vary from lack of food, famine, under and malnutrition to low or even negative Growth Domestic Product (GDP). Although drought affects the agriculture sector the most, other sectors like health and development are also negatively impacted through snowballing effect. If agriculture output is reduced by droughts communities that depend on agriculture production get low or limited incomes. This in turn results in community food scarcities, undernourishment, and maybe starvation. In Zimbabwe, agriculture contributes more than 60% to the GDP. If droughts strike all other sectors feel the pinch as they are affected (Government of Zimbabwe, 2009). Zimbabwe often suffers from mid-season droughts. The mid-season dry spells result in soil moisture reduction causing large negative alternations of crop yields and net loss on a crop of production. Losses in food production forced the government to suspend some developmental projects to try and address food gaps through relief aid to those community in need.

Table 3.2 below illustrates the 2016 maize production shortfall in some Southern Africa Development Community (SADC) countries and the number of affected people. The table shows that there was the reduction in maize production from 2015 by 31% in Zimbabwe.

Table 3.2: Maize production deficit in SADC and the number of affected people in 2016

Country	2011–2015 average ('000 tons)	2015 maize production ('000 tons)	2016 maize production ('000 tons)	% change 2015/2016	No. of affected people in 2016
Angola	1,366	1,878	1,500	-20	756,000.00
Botswana	21	4	1	-75	1,100,000.00
Lesotho	74	79	25	-68	709,000.00
Madagascar	393	350	300	-14	1,400,000.00
Malawi	3,583	2,776	2,369	-15	6,500,000.00
Mozambique	1,602	1,357	1,350	-1	2,000,000.00
South Africa	12,345	10,629	7,733	-27	14,300,000.00
Swaziland	89	82	33	-60	638,000.00
Zimbabwe	1,083	742	512	-31	4,000,000.00

Source: FAO GIEWS (2016)

The SADC region was affected by three consecutive droughts years between 2013 and 2016 and 2015/2016 was one of the worst droughts in the decade resulting from the strongest El Nino Southern Oscillation (ENSO) event (SADC, 2016). FAO (2016) regards the 2015/2016 drought as the worst event that affected the region since proper recording keeping was started more than a century ago. As shown in Table 3.2 above, more than 40 million people were food insecure in that season requiring international intervention estimated at 2.7 billion United States Dollars (SADC, 2016).

Although food and water needs can be estimated, it is, however, problematic to comprehensively evaluate the cost of droughts due to their creeping nature. In developing countries such as Zimbabwe, limited drought data over years makes it even difficult to estimate the costs (Changnon 2003). Drought reduces the growth of African economies largely by reducing peoples livelihood bases and eroding coping capacities including the environment (Benson & Clay, 1994)

3.8.2 Social impacts

Droughts distress people so the social impacts of droughts are perhaps more direct and severe than others effects. Droughts result in serious health problems such as malnutrition due to lack of food, starvation, and other social issues like school dropouts, lack of development and a lot of other social conflicts (Alston & Kent, 2004). Health and hygiene are a result of the direct impacts of a shortage of water and food. Waterborne diseases like cholera often increase during drought season as communities will not have access to clean potable water and sanitation is often compromised.

During drought periods, nutrition is severely impacted due to the reduction in food production. Such health problems like malnutrition and hunger affect people and livestock. Food and nutrition problems expose societies to diseases that sometimes results in morbidity and deaths. Droughts also result in people moving to other areas. If the development agenda does not mainstream proper management of the environment, climate change adaptation, more people could find themselves internally displaced or even refugees in pursuit of water. The current situation in and other countries where people cross borders to countries like South Africa will increase as agro-based livelihoods will be difficult to pursue. It is this researchers view that resource conflict is likely to increase in Africa as a result of droughts and or natural hazards.

3.8.3 Environmental impacts

The effect of droughts on the environment is also one of the worrying trends throughout the world. The impact of drought on vegetation includes desertification and secondary impacts

like veld fires cause biodiversity loss, affects soil quality and then agricultural production is also affected. Drought reduces soil moisture causing important micro organisms, which are important for organic activity in the soil. Moisture loss affects soil quality and other ecosystems.

Drought hazards affect aquatic systems such as rivers, dams, lakes; animals including humans that depend on these systems are also affected by the dryness. Biodiversity loss disrupts the condition of the ecosystem as food and energy chains get broken. In addition to the deterioration of aquatic life, drought affects water quality as wetland and other ecosystems that purify water will not be able to work efficiently.

According to Slik (2004), droughts quickens land dilapidation, for example, in Zimbabwe rural communities start burning trees for charcoal and firewood sales. This does not only reduce destroy the environment but also contributes to the emission of greenhouse gases.

3.9 Defining preparedness

This study adopted the definition of disaster preparedness that was put forward by OCHA and UNISDR as shown in Figure 3.7 below. It is defined as;

“Knowledge and capacity developed by governments, recovery organisations communities and individuals to anticipate, respond and recover from the impact of potential imminent or current hazard events or emergency that call for a humanitarian response” (UNOCHA & UNISDR, 2008).

Preparedness emphasises increasing capacities at all levels of the community to manage a particular disaster efficiently, effectively and advance systems that warrant sustainable and better recovery. The concept of *building back better for the future* is encapsulated in the Sendai Framework for Disaster Risk Reduction 2015-2030 (UN, 2015).

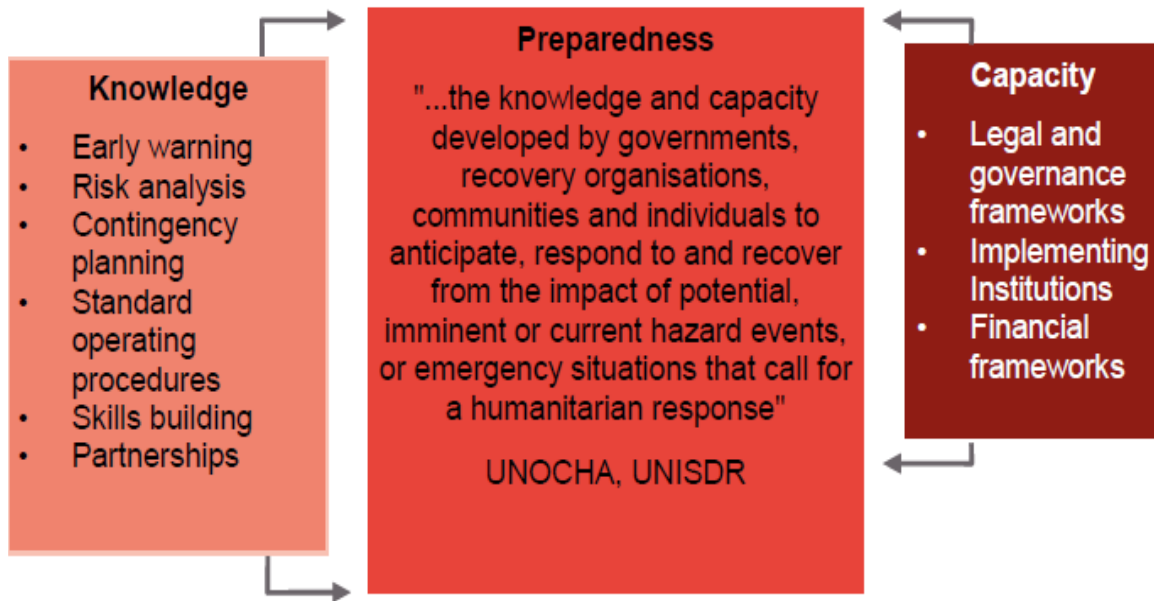


Figure 3.7: Construct of preparedness

Source: Development initiatives, UNISDR and UNOCHA (2017)

Effective disaster preparedness is directed by a strong unbiased and objective risk analysis, planning, early warning, contingency planning, training, and building of the partnership. Disaster preparedness should be reinforced by robust institutions and appropriate legal, policy, and resource frameworks. It is also essential to have a political will from all members of the society, behaviour change strategies, and other enabling factors within the community.

Preparedness describes a state of readiness. It entails the measures and actions that are done before a disaster to enable an effective disaster response. The activities comprise the issuing of effective cautions or warnings and to some extreme situation relocation of affected communities from the hazardous pathway to safe areas (UNISDR, 2004). Generally, preparedness allows individuals, societies, organisations, and states to respond faster and effectively to a disaster. The identification and mobilisation of community capacities that include skills, materials enable the response to be informed and relevant. Disaster preparedness is critical for an effective response and it is gradually being acknowledged that preparedness improves efficacious recovery interventions as well (Sutton & Tierney, 2006).

3.10 Preparedness as part of a proactive risk reduction trajectory

According to Hemond and Robert (2012), the scholarly interest in the concept of preparedness has been increasing since the 1970s. It was at a time when researchers identified gaps in disaster management in general especially the more focus on disaster response. However, before 1970 there were comparable concepts like the readiness concept (Simpson, 2008), contingency planning concepts (Balamir, 2002), disaster capacity-building concepts (Tadele & Manyena, 2009), business continuity concept (Hemond &

Robert, 2012) developed by other scholars. All these concepts are related and very analogous to the preparedness concept. Staupe-Delgado and Kruke (2017) accepted that preparedness is still a young topic and practice and has started developing a few decades ago. It is also important that although it is regarded as a young concept it has been practising since long ago. Preparedness is receiving more consideration now due to the need for sustainable development, a focus on a proactive risk reduction trajectory and the SFDRR.

There are, however, contradictions that are in preparedness literature, for instance, other scholars regard emergency planning as if it is preparedness, others scholars argue that only the planning aspect of disaster response is preparedness (Perry & Lindell, 2003). It is the view of this researcher that preparedness is a type of response it is a *pre-disaster response*. It is not limited to planning but includes such activities as resource mobilisation, surveillance, the preposition of relief, monitoring of hazards, coordination, early warning amongst other activities.

It is therefore vital to appreciate the dissimilar conceptual and contextual use of the preparedness concept. Broadly, disaster preparedness includes numerous activities that were identified by Kent (1994) in the disaster preparedness framework. Preparedness also incorporates activities like early warning, stockpiling, evacuation, coordination, and establishment of institutional and governance frameworks. Preparedness interventions are related to each hazard and the speed of onset.

3.11 Preparedness as a continuous process

Other scholars view disaster preparedness as an *end-state*, for instance, adopting the phrase '*state of preparedness*' whereas others view disaster preparedness as a continuous process that needs to be undertaken before during and after the disaster (Hemond & Robert, 2012). The assertion that disaster preparedness is an end state is oblivious of the fact that hazards continue to change due to other factors. Droughts are not the same hence there is a need to continuously adjust preparedness plans, upgrade data and information, upgrade equipment, train staff amongst other things. This researcher, therefore, views disaster preparedness in terms of the newer thinking of the disaster management spiral instead of the disaster management cycle. It is a continuous process that needs to be updated and review. Last years drought preparedness plans could not be very relevant to this years plans hence preparedness is a *living process*.

3.12 Preparedness and political will

There seem to be however some agreement amongst scholars that in light of the increasing frequency and impacts of drought there is a need to adopt a proactive disaster management trajectory. Although this view is gaining some traction especially in developed countries, developing countries like Zimbabwe still view disaster management with reactive lenses (Eriksson, 2010). According to Baird (2010), disaster preparedness has great potential to bridge the gap between mitigation and response. The only challenges are that preparedness is not getting sufficient consideration by policymakers. The focus is on the actual response capacity which is the *post-disaster* component of disaster management leaving other disaster risk reduction elements. Mays et al (2013) acknowledged that preparedness helps disaster response but it does not fit well. The inclination by policymakers to emphasise only the post-disaster response capacity of preparedness displays this inclination towards reaction than proactivity. The reason why there is a lack of political will to invest in disaster preparedness could be attributed to economic challenges and preparedness actions to attract political votes. It is problematic for disaster preparedness to get political spaces even though the cost of preparedness is far much lower than that of disaster response (Staupe - Delgado & Kruke, 2017). If investment in disaster preparedness and mitigation is done and resources are allocated and no disaster happens or the disaster is averted, non-event creates difficulties for politicians to defend investment in disaster preparedness.

3.13 Gaps in drought preparedness in Zimbabwe

Assessment of drought preparedness and mitigation in Southern Africa including Zimbabwe by UNSO (1999), showed gaps and challenges in current drought preparedness interventions. Another assessment and review carried between the 20th to 31st of March 2017 by the Capacity for Disaster Reduction Initiative (CADRI, 2017) highlighted similar challenges. Amongst many identified gaps, the following are the three gaps that the researcher finds imperative and applicable to the subject under discussion.

(i) Lack of permanent state body that is responsible for drought issues

Drought is almost a perpetual feature in Zimbabwe, particularly in agro-ecological regions IV and V however, no government body is in charge of droughts issues. Currently, droughts committees are established by the Civil Protection Unit. The CPU members have their roles and responsibilities as they are seconded by their employers making it difficult for them to devote much time to droughts. There is, therefore, a need to set up a government body that is solely responsible for droughts looking at DRR and response actions.

(ii) Drought relief activities are generally for humans, asset protection and recovery

The current emphasis is still on responsive drought management and a lot of resources are given to drought relief interventions by the government and NGOs. According to Lamboll et al (2011), in Southern Africa, well-coordinated drought management structures and strategies are absent. Also, these activities focus on humanitarian relief and recovery. There is limited emphasis on the environment.

(iii) No post-drought response evaluations are undertaken

The current scenario is that there are no evaluations and documentation of lessons learnt after every drought event. This is one of the problems that was highlighted by the Capacity Assessment of the Disaster Risk Management in Zimbabwe (CADRI, 2017). After drought relief activities the government and NGOs must assess and review their response, check their preparedness plans and strategies, mitigation interventions and response interventions. The same capacity assessment found out that no resources are put in place for drought response monitoring and evaluations. It also noted that there is also a general absence of political will to conduct these evaluations.

3.14 Drought adaptation in Zimbabwe

Drought adaptation refers to the processes by which communities improve their coping abilities or management of an undefined future due to droughts. The actions comprise making modifications that are meant to reduce undesirable impacts (UNFCCC, 2007). In Zimbabwe, Bang and Sitango (2003) recommended the planting of small grains as one of the approaches that societies who suffer drought risks. Small grains are generally drought-resistant and tolerant. Drought resistant and tolerant crops have been planted in Zimbabwe for a very long time but over years communities were introduced to maize and their preferences changed. Maize needs much more a lot of water for growth until maturity. The drought-tolerant crops must be becoming more relevant now as climate change becomes more pronounced.

Conservation Agriculture (CA) is one of the strategies used in Zimbabwe. Conservation agriculture is a method of farming that aims at sustainable crop production of crops whilst conserving the environment. It is a concept of farming that has been proven to conserve moisture or water soil fertility. In some case conservation farming is integrated into agroecology and other concepts that mimic nature. According to FAO (2008), conservation farming has principles which are minimum soil disturbance, use and encouragement of mulching or soil cover. Studies in Zimbabwe and other countries CA principles if followed

well can contribute to better harvest and stable yields on small pieces of land, improvement in soil fertility and soil structure, water and moisture conservation. Mulch and soil cover also reduce soil erosion that occurs during the first rains (Giller et al., 2011).

3.15 Chapter summary

Chapter three reviewed literature relevant to the study on drought and preparedness concepts. The concept of the drought was reviewed and its different meaning. The researcher further explored the anthropogenic causes of drought. Drought trends were examined starting from the global perspective to the local level and area of study. The concept and literature on preparedness were reviewed focus on the concept of preparedness and scholarly contradictions that are found in the literature. The researcher also explored the challenges of drought preparedness in Zimbabwe and some actions that are being done to adapt and prepare for droughts. Literature review enabled the researcher to have a broader knowledge on the subject of drought and preparedness in general. Broader knowledge of the topic was used to improve the methodology of the study and to clarify the research study.

The concept of the drought was explored, and it was concluded that drought has many dimensions, sometimes hard to understand, as it is complex. The components of drought include the natural hazard, which is the drought event itself, and the social factors that are responsible for vulnerability. The social factors, therefore, are responsible for differences in the severity and magnitude of its impact.

The preparedness concept has different components and pillars these components include risk assessment, planning process legislative, policy framework and response mechanism amongst others. Preparedness is all about the readiness of the communities to respond and recover. The lesson drawn from reviewing the preparedness concept is that it has two concepts knowledge and capacity building.

CHAPTER FOUR: RESEARCH METHODOLOGY

4.1 Research Methodology– the introduction

This chapter outlines the methodology used in carrying out the research. The methodology outlines the reasoning behind the employed methods, techniques and approaches in the research (Wellman et al., 2005). Outlining research methods, strategies, tools and techniques of the study enable other researchers and readers to be able to review and evaluate the research. There are several methodology frameworks and this researcher adopted the ‘research onion framework’. The research onion framework was put forward by Saunders et al. (2007) and is shown in Figure 4.1 below. It provides details and describes the important layers that need to be attained to effectively formulate a sound methodology (Raithatha, 2017). The reason why the framework was chosen is that in addition to showing the simple and systematic progression of research, it is also adaptable and can be used in a different context (Bryman, 2012). According to Saunders et al. (2007), the layers of the research onion framework includes 1) Philosophy, 2) Approaches, 3) Strategy, 4) Choices, 5) Time horizon and 5) Techniques and procedures. It also discusses validity, reliability and ethical considerations made throughout the process.

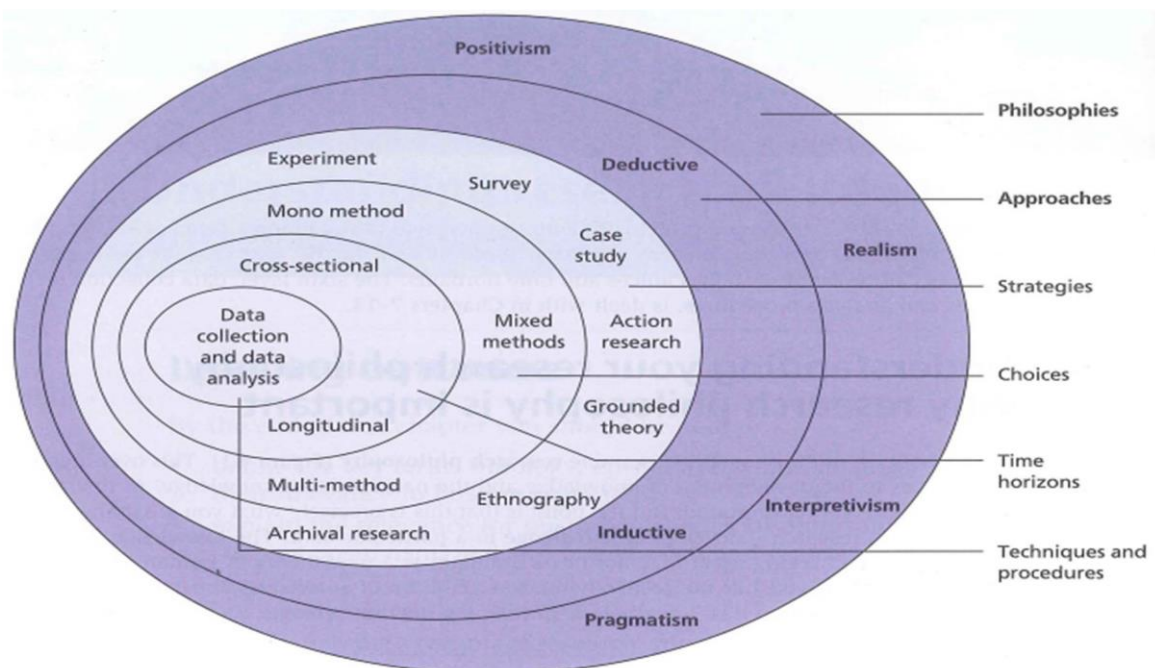


Figure 4.1: Research onion
Source: Saunders et al., (2007)

4.2 Research philosophy

Research philosophy denotes the beliefs concerning the nature of the reality (*ontology*) sources of facts or knowledge (*epistemology*) and beliefs, ethics and values (*axiology*) of the

research (Saunders et al., 2003; Bryman, 2012). The philosophy chosen in this research is positivism. Positivism entails realism that exists autonomously of the issue being researched (Newman, 1998). Positivism refers to the study of reality and it makes one understand how nature influences or affects people. Drought is a natural reality and this study focuses on how this natural event affects communities and how they react to it. Positivism is relevant to this research as it is useful in measuring and explaining common knowledge of the world (Silverman, 2013).

4.3 Approach

The second layer of the research onion is the approach, which can either be deductive and inductive. According to Silverman (2013), a deductive approach is when one creates a hypothesis using pre-existing theories and uses the research approach to test it. On the other hand, the inductive approach allows one to develop their theory. The researcher used the inductive approach which according to Bryman and Bell (2011) focuses on the move from specifics to general, where the researcher starts with observations and finds patterns from data to conclude (Beike, 2007). Data collection through interviews is conducted on a specific phenomenon and the patterns between the respondents (Flick, 2011). The researcher collected data on drought through interviews and examined patterns to come to conclusions about drought preparedness.

4.4 Strategy

According to Saunders et al. (2007), the strategy gives details on how the researcher plans to conduct the research. The strategy can use several approaches (Saunders et al., 2007) so this study used survey and case study and they are each explained in the next section.

4.4.1 Survey strategy

The survey strategy entails using representative sampling of the study population (Bryman and Bell, 2011). It allows the collection of vast data to answer the study questions. The researcher used this strategy because is an economic strategy to collect data about preparedness for the drought. The survey also enabled the answering of the study questions.

4.4.2 Case study

Creswell (2003) stated that case studies are used when the researcher is doing an exhaustive investigation of a phenomenon, action, and process of one or more people. A case study focuses on a single person, single group or single area. The researcher selected the case study strategy as the research only focuses on Daluka ward, which is a single

geographic area and carried out an in-depth examination of drought preparedness. Bryman (2012) concluded that a case study is a strategy that is used to assess a single unit so that important features are established enabling the researcher to draw generalisations. This research assesses drought preparedness in Daluka ward to draw generalisations about the state of drought preparedness. The researcher argues that the concept of drought preparedness is poorly understood hence a case study is relevant following Leedy and Ormrod (2001:149) who stated that, “*case studies attempt to learn more about a little known or poorly understood situation*”. The researcher chose the case study method as it seeks to answer ‘how’ or ‘what’ questions and the researcher has no control over events like drought.

4.5 Choice

The fourth layer on the research onion is the research choice, which helps the researcher to be able to know which methodology to use, whether to choose qualitative or quantitative or to combine the methods. What determines the credibility and exhaustiveness of the research are the methods used to collect and analyse the data (Bryman, 2008). This research uses the mixed method approach as it permits the combination of quantitative and qualitative methodology to achieve quality research. The mixed-method ensure that important aspects of the research are not missed. It is regarded as the third force in a survey as it ignores the difference between the qualitative and quantitative methods.

This research made use of a mixed qualitative and quantitative technique as this helps in the triangulation of the data and makes sure that the data is representative. Using the mixed method also helped in ensuring that the data sources are checked for authenticity. In addition, the mixed method enabled the researcher to benefit from the combination of both qualitative and quantitative techniques. As Johnson et al. (2007) concluded there is no need for the researcher to be forced to adopt one of the traditional paradigms when they can have the best from both methods.

4.6 Time horizon

Time horizon spells out the time required by the researcher to complete the research. The researcher adopted a cross-sectional time horizon as it allowed for data to be collected at a set time given the COVID-19 pandemic. Therefore, the researcher used the cross-sectional time horizon as the time for data collection was established when negotiations were done with the local authorities.

4.7 Data collection and analysis

Data collection and analysis is the sixth and innermost layer of the research onion according to Saunders et al., (2007). The reliability and validity of research depend on the processes carried out and tools used at this stage. According to (Bryman, 2012), data collection and analysis depends on the methodological approach the researcher adopts. This layer explains how the data is collected, prepared and analysed, sources of data, sampling methods adopted, sample size calculation, ethics and limitations of the study. It also covers the validity and reliability issues of the study.

4.7.1 Study population

Cooper and Schindler (2003) defined the study population as all the elements to which the researcher wishes to make inferences. It is a set of all the possible elements included in any research. This research focuses on Daluka ward and the population is all the people who are above the age of 18 years. Table 4.1 below shows the population of Daluka ward.

4.7.2 Sampling techniques

Kothari (2004) defined sampling as the process of choosing some part of the study population to make a judgment about the whole population. Sampling is a subset of the population from which the investigator extracts information and makes conclusions. It should be noted that the objective is to use the sample and learn about the study population. Sampling techniques also determine the manner data is collected. The selection of the data collection methods and from whom data is collected should be done wisely. The researcher adopted the purposive sampling method.

4.7.2.1 Purposive sampling

The purposive sampling technique is also called judgment sampling because it is a deliberate selection of research participants based on the knowledge they have about the research topic and study area. The researcher determines what information is required and then finds people who can provide information based on their experiences and knowledge (Bernard, 2002). In this study, the researcher first determined the information required on drought preparedness and then identified the key informants that had knowledge of the subject and the area under study.

4.7.2.2 Sampling of household representatives

The researcher purposively targeted adult household representatives who have participated or are participating in development, disaster response, disaster risk reduction and other community projects to be key informants. According to Bernard (2002), the key informant

technique is the most relevant in purposive sampling. Bernard (2002) added that key informants are very observant community members who can reflect and analyse the situation about their community and they are often willing to share their understanding and knowledge. Purposive sampling is relevant for this research as the researcher wanted to have an in-depth understanding of drought and preparedness in Daluka ward. The research targeted 15% of households in the 7 villages. The researcher targeted household representatives who are participating or have participated in community projects on development, disaster risk reduction and response.

4.7.2.3 Sample size

According to Fraenkel and Wallen (2000), there is no clear answer on what could be regarded as a sufficient or adequate sample size. The researcher made with the community leaders to find out the best way of getting in-depth information and who could be the best key informants. It was noted that at least one person per household had participated in projects and therefore could be part of the study population (N) and in Daluka ward there are 850 households so N=850. Table 4.1 below illustrates the calculation of sample size showing the sampled households in all the seven villages of Daluka ward. The researcher sampled 15% of the households in the ward to achieve data reliability given the limited resources, time and the COVID -19 restrictions that needed to be followed.

Table 4.1: Calculation of sample size of community projects key informants

Village	Population	Number of HHs	Study Population (N)	Sample size (n)15%
Daluka	898	176	176	26
Gandangula	704	138	138	21
Sivalo	607	119	119	18
Mafinyela	653	128	128	19
Sibangani 1	500	98	98	15
Sibangani2	490	96	96	14
Strip road	485	95	95	14
	4355	850	850	127

Source: Computed by the Author

The researcher agrees with Patton, 2002 (in DeVos, 2005) who stated that there is no rule for setting up a sample size for a qualitative inquiry. It should be determined by the researcher's information needs, purpose and what is useful. Although Grinnell & Williams (1990) concluded that 10% sample size is often sufficient to control sample error, the researcher decided to increase the sample size by 5% to 15% to increase reliability and reduce sampling errors.

4.7.2.4 Leaders and key experts informant sampling

The researcher used the expert sampling technique to identify respondents with expertise in drought, preparedness and the local area. The expert sampling method is part of the purposive sampling technique. Targeting experts and people who knew the area, drought and projects in Daluka was critical not only for triangulation of data from other sources like projects key informants and focus group discussions but also to understand some community socio-political dynamics. These helped to interpret and draw conclusions from the data. The researcher interviewed six people drawn from NGOs, government departments and community leaders as shown in Table 4.2 below:

Table 4.2: Key experts interview participants

Organisation/Department	Interviewees
Dan Church Aid (International NGO)	1
Agriculture Extension Services	1
Daluka Ward Councillor	1
Christian Youth Volunteers Association	1
Zwangendaba Secondary School	1
Daluka Disaster Risk Reduction Committee	1
Total	6

Source: Computed by the Author

4.7.6 Sources of data

Mesly (2015), stated that data collection is achieved through primary sources where the researcher is the first person to get the data. Saunders et al. (2003), further emphasizing the fact that primary data is data obtained from the point of origin by the researcher. The other source is secondary data where the researcher reviews data that was collected by other sources. Therefore, the researcher used both primary and secondary sources of data.

4.7.6.1 Primary data sources

The researcher used the household representative participants questionnaires (*attached as Annex 1*), Expert key informants interview (*Annex 2*) and focus group discussion (*Annex 3*). The three data collection tools collected both quantitative and qualitative data on drought and preparedness in Daluka ward through semi-structured interviews for the questionnaires and open-ended questions for focus group discussions. The researcher selected semi-structured interviews as they allowed questions to be adaptable to the interviews and allowed flexibility (Bryman, 2008). As opposed to structured interviews the semi-structured are not rigid and can easily change to suit the background of the interviewees hence relevant in Daluka ward where people of different educational and social background were interviewed.

4.7.6.2 Secondary data sources

The researcher also used secondary data sources to achieve an in-depth understanding of Daluka ward and drought preparedness. Secondary documents that were used in this study include reports from the Agricultural Department, Department of Social Welfare, NGOs, and community reports. The reports included Disaster and Resilience Plans, Contingency plans and strategies and Zimbabwe Vulnerability Assessment Reports amongst other documents from the local authorities in Lupane District.

4.7.7 Data collection process

4.7.7.1 Household representatives questionnaire

Cavana et al. (2001) stated that after the research questions the researcher should collect data by using qualitative or quantitative methods. Due to COVID-19 restrictions, data collection was carried out in a controlled environment during project activities like food aid distributions and community garden activities, which were supervised by the Ministry of Health and Child Welfare to ensure that COVID-19 protocols were being adhered to. The interviews were conducted with people wearing a facemask, observing the physical distance of two metres apart.

The researcher identified possible participants from different community projects with the help of project leaders. The households that participated in the survey were represented by one adult individual who was interviewed. The interview participants were encouraged to be truthful and answer as much as possible based on their knowledge and experiences. The research assistants collected all the responses using mobile data collection devices after receiving consent.

4.7.7.2 Mobile data collection method

The researcher opted to use the Mobile data collection (MDC) tool to collect data. Mobile data collection is the use of tablets or smartphones to record during a face-to-face interview. Bouwman, Reuver and Verkasalo (2013) quote the work of Dordick and LaRose (1992) in their pioneering work on telephony and Cohen & Lemish (2013) on the capabilities of mobile phones as the springboard for increased use of mobile phones and applications for data collection in research work. The advantages of mobile data collection include the elimination of data entry as data is uploaded via the mobile network and downloaded, it imposes validation rules on data entry reducing human error and reducing data cleaning time (Thriemer et al., 2012). The use of mobile data collection was also a COVID-19 precautionary measure to avoid many hands touching the paper questionnaire. It was easy to clean smartphones and tablets using alcohol-based sanitisers after every interview. In

addition, the researcher wanted to minimise the use and printing of the paper questionnaire and contribute to saving the environment and carbon emission.

The questionnaire was digitalised using a data collection tool called Magpi software as they appear on the paper questionnaire. Magpi application works offline and only requires mobile data or the internet during synchronisation and uploading to data. Therefore, the data collectors managed to collect data in remote areas as planned. The mobile tool captured geo positions through GPS in the build-in system. It also helped in reducing human error by building invalidation and logic like skip logic. The data collectors were trained on how to use the smartphones and most of them had previous experience in data collection using the same application as it was being used by NGOs in the area. All the responses were captured, and mobile phones/tablets synchronised using the internet so that all the data was saved in the database accessible to the researcher for download and analysis. This eliminated data entry and reduced the data cleaning process due to the in-built validation and logic.

4.7.7.3 Key informant Interviews- Leaders and experts interviews

Interviews with experts and leaders were done using mobile phones either through a telephone call interview or through WhatsApp messages. The procedure followed the one above for community project participants to explain the purpose of the interview, seeking consent and explaining confidentiality and stressing that all the information would be used for academic purposes only.

4.7.7.4 Focus group discussions

A carefully planned discussion meant to get views and perceptions on a topic in a free environment is called focus group discussions (FGDs) according to De Vos (2005). In addition, Krueger & Casey (2000) concluded that FGDs are important as they help the researcher to understand diversity and various experiences. FGDs are a useful tool for understanding diversity since they help the researcher to understand various experiences. The researcher mobilised two focus group discussions each with 12 participants, this number is recommended by Bruseberg & McDough (2003). The mobilised number of people helped to generate relevant discussions at the same time avoiding a crowd that would be difficult to control.

In each group, has 12 participants making a total of 24 participants 12 female and 12 males. The researcher thanked the participants, explained the purpose of the research, introduction of participants and research assistants who assisted in ensuring that all the notes were taken appropriately, and participants followed the COVID-19 protocols of social distancing,

wearing of mask and hand washing. The researcher explained that all the information would be confidential and anonymous, and they should feel free to share their thoughts and ideas. After the discussion, all participants were thanked for their participation. All the responses were collected by research assistants who wrote the responses that were given by the participants.

4.7.8 Data analysis and presentation of community projects informant data

Data analysis comprises finding facts or meaning from the tables, graphs and other qualitative information through computations and searching for relationships between data and variables and computations (Kothari, 2004). The researcher collected both quantitative and qualitative data. The quantitative data was primarily the coded data from projects key informants and the qualitative data was from focus group discussions and expert's informants.

The purpose of data analysis and presentation is to show and illustrate data outputs making data to be easily understood through frequency distribution tables. The researcher used some presentations, which included tables and different forms of graphs for qualitative and quantitative data. This presentation makes it easy for the interpretation of data and analysis. Before data presentation was done, data was cleaned and edited for errors as recommended by Kothari (2004). The data was thoroughly scrutinised by checking the responses making sure they were consistent and arranged in a manner to facilitate analysis. The researcher used a computer programme called Statistical Programme for Social Science (SPSS) and some features of Microsoft Excel to create graphs and other visual presentations. The graphs and tables made it easy for the researcher to understand the data and be able to interpret and analyse it further. The researcher used histograms, tables, graphs, pie charts to show the distribution of quantitative data varying on a continuum. The histogram helped the researcher to understand the distribution and spread of data sets. Bar charts were used on data like demographics, and other data sets, which are in discrete units.

4.7.9 Analysis of qualitative data land experts key informants and FGDs

The analysis of non-numeric data, interpretation of observations to discover patterns and meanings is called qualitative analysis (Babbie, 2001). The researcher followed the process of data reduction. The researcher followed a data analysis process which was proposed by Miles and Huberman (1994) which consist of three stages, which are data reduction, data display and drawing of conclusions.

4.7.9.1 Data reduction

Data reduction is the first step in qualitative data analysis and involves summarising data sets, choosing basic and important aspects, and compiling common themes and patterns. Patton (2002) states that it is the process of carefully selecting, simplifying and changing the data sets to be in clear and understandable formats and patterns. The researcher firstly downloaded all the qualitative data from mobile applications like WhatsApp and arranged it into clear patterns and categories, all the hand-written notes collected from focus group discussions and telephone conversations were categorised in such a way that enabled easy analysis. The process also included removal of unimportant texts, unnecessary repetition and organising the data into simple themes.

4.7.9.2 Data display

This is the second step of compressing the reduced data into information that would enable the researcher to make conclusions. It involves putting data into graphs or diagrams to illustrate details of the information that is in long textual formats. Welman et al. (2005) stated that data display is a systematic process that involves making it easy to make conclusions and actions from qualitative information using visual representations. The researcher organised the information into graphs and timelines to make it easy to conclude.

4.7.9.3 Concluding and verification

Drawing conclusions and verification is the third stage in qualitative analysis. This means looking at the analysed data and trying to find out the meaning and their implication to the research questions. The verification process is also part of concluding and it involves cross-checking the data many times to ensure that the conclusions are right. According to Miles and Huberman (1994), the meaning that comes from the data, "*must be tested for their plausibility, sturdiness and their conformability – which is their validity*". The researcher used the analysed information to draw conclusions based on the research questions. A verification process was undertaken several times to check if the conclusions drawn are indeed in line with what interviewees put across.

4.8 Validity and reliability

4.8.1 Validity

Bryman (2008) regards validity as truthfulness/integrity of the inferences that are made in research. Neuman (2003) states that validity refers to the truthfulness and it bridges data and constructs. It refers to the extent to which the researcher can get the intended participant meaning from all the data. It is regarded as the correlation between the data and

the conclusion. The researcher allowed participants of interview sessions to use their language and allowed them time to explain as much as possible their responses. By allowing other participants to repeat ideas in their own words and ways the researcher followed what Silverman (2006) termed the constant comparative method in qualitative validity. The constant comparative methods allowed the researcher to be able to test the truthfulness of the issues raised by different participants.

4.8.2 Reliability

Neuman (2003) stated that in qualitative research '*reliability means dependability of consistency*'. Neuman (2003) further argues that using a variety of data collection techniques like interviews, document reviews, participation and the recording of the observations and responses consistently is part of reliability. The researcher recorded all the observations and responses consistently to ensure reliability. Standardized methods of note-taking, data entry using Magpi software was used to enhance data reliability following Neuman (2003) who added that proper writing of notes and transcripts for interviews contribute to enhancing reliability.

4.9 Ethical issues

It is always important that if data collection is done by people and about people certain ethical considerations should be made (Punch, 2005). This is important to develop trust, enhance the integrity of the research, reduce misconduct, and negative issues that can affect them. Ethical considerations were particularly important especially given the COVID-19 pandemic. The researcher ensured that ethical issues concerning informed consent, secrecy, privacy, truthfulness were considered every time (Leedy and Omrod, 2001). Moreover, the issue of conducting interviews in a safe and comfortable environment was not going to expose people to the COVID-19.

4.9.1 Informed consent

The researcher explained repeatedly that participation in the research process was voluntary and the participants were allowed to withdraw anytime during the process.

4.9.2 Protection from possible harm

The research process especially the data collection process was done in a safe environment ensuring that COVID-19 protocols were observed. These included physical distancing, wearing masks and hand washing/sanitising during the process. This enabled the participants to be free from stress and safety concerns. The environment was free and

ground rules of respecting participant's contributions during focus group discussions were put in place for participants not to feel embarrassed and to feel respected.

4.9.3 Honesty and professionalism

The work of other researchers and scholars was fully acknowledged during this research using Harvard referencing method. The researcher also showed gratitude to all the people who participated in the survey as a way of showing professionalism.

4.9.4 Privacy and confidentiality

The researcher did not capture the names of the participants during data collection to ensure the right to privacy and the research questionnaires were coded and information was regarded as confidential. Instead of writing the name of the households participants, each household was given a number for identification.

4.9.5 Respect

During and after data collection the researcher respected the cultural values and norms of Daluka people and protocol requirements by the local leadership. The questionnaire was tailored to be in line with the language and beliefs of the local population.

4.10 Researcher's role

The researcher sought permission from Kusile Rural council authorities in Lupane (see *attached Annexure*), local political and traditional leaders in Daluka ward and from project leaders in the community. The researcher also ensured that all required documentation for approval was shared with the authorities and all protocol was observed. The researcher ensured that all the tools developed sent to the required areas, digital data collection phones/tablets were charged, and they were working well. The data collectors were trained and transported to the areas on time. The researcher also ensured that participants for focus group discussions were mobilised and they understood the purpose of the survey. The researcher also applied for Ethical Clearance to the University of Free State which was received.

4.11 Limitations of the study

This research was carried out when the COVID-19 pandemic was spreading around the world and the government of Zimbabwe had put in place different measures to contain the virus. Some participants for the focus group discussions did not attend, as they were afraid of exposing themselves to the virus. The curfews also affected the discussions as participants had to walk back home.

The local community was used to seeing or hearing NGO workers carrying assessments and similar studies, so they assumed that data collection was part of the Danish Church Aid food programmes in the area. Some respondents tried to influence the responses to show their vulnerability. However, the questions and the line of the questionnaire mainly focused on the study and the data collectors constantly reminded the participants to be truthful and focus on the study issues as this was only for academic purposes.

4.12 Summary of the chapter

This chapter discussed the research methodology outlining the steps and procedures that were followed by the researcher to collect data. The mixed-method approach that combines quantitative and qualitative approaches was adopted to take advantage of both qualitative and quantitative methods. The chapter showed the methods, strategy used and reasons why they were adopted by the researcher. The researcher adopted the research onion framework and illustrated how each stage of the framework was used.

The techniques and procedures of collecting data, processing and analysis were highlighted in this chapter. It also outlined different sources of data that were used in the research. The following chapter outlined the survey results and interpretation with the view of coming up with conclusions and recommendation.

CHAPTER FIVE: DATA ANALYSIS, PRESENTATION AND DISCUSSION OF FINDINGS

5.1 Introduction

Chapter 5 presents the study research findings. One hundred and twenty-seven (127) household questionnaires were completed which marks a 100% response rate. Data from two focus group discussions (FGDs) and six key informant's interviews are consolidated and discussed together with responses from household questionnaires. The results are presented in tabular and graphic forms, interpreted and discussed with the view of bringing out key findings. The key findings are then summarised at the end of the chapter to draw out conclusions and recommendations which are presented in chapter six.

The socio-demographic information of household respondents is analysed and discussed before presenting and analysing the results relating to drought frequency, impact and preparedness. To meet the research objective of analysing the effectiveness of drought preparedness in Daluka ward, the researcher followed the elements of the disaster preparedness framework proposed by Kent (1994). These elements of the disaster preparedness framework discussed are *vulnerability assessment, planning, institutional framework, information system, resource base, warning system, response mechanism, public education and training*. Rehearsal was left out as it is difficult to predict the nature and magnitude of a drought hence is it difficult to do drill and rehearse how to respond to a drought. The discussion is also informed and guided by Wilhite's (1991) work especially the 10-step drought planning process.

5.2 Socio-demographic analysis

The socio-demographic data of the respondents relate to the personal and household demographic and social information. The researcher only selected location, age, gender, educational level and marital status as socio-demographic parameters. Socio-demographic data can be used to explain a household's behaviour. Socio-demographic data is important to find out whether the responses and overall results are not influenced by their demographic and social status. Generally, the respondents and household characteristics influence the capacity of the household to implement drought preparedness interventions.

5.2.1 The geographic location of the respondents

The survey sampled all the seven villages in Daluka ward as follows, Daluka village had 26 respondents (20.5%), Gandangula village had 21 respondents (16.5%), Sivalo village had 18 respondents (14.2%). Mafinyela village had 19 respondents (15%), Sibangani 1 village had

15 respondents (11.8%), Sibangani 2 village had 14 respondents (11%), and Strip road village had 14 respondents (11%) as shown in Figure 5.1 below. The number of participants is proportional to the population of the village.

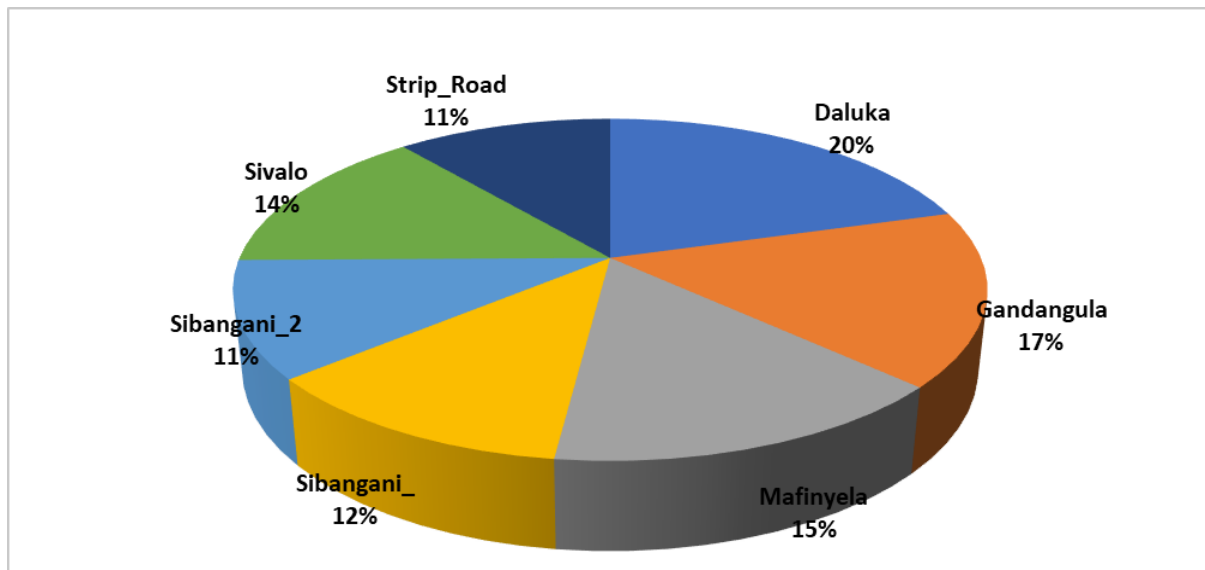


Figure 5.1: Distribution of respondents by the village

Source: Survey data

Two focus group (FGD) discussions were held, one at Zwangendaba Secondary school with 11 participants mainly from Daluka, Mafinyela, and Gandangula villages. The second FGD was held in Sibangani area shops with 12 participants mainly from Sibangani 1 and Sibangani 2 villages. In total, the two focus group discussions had 23 participants. Key informant's interviews were successfully held with six informants over telephone and WhatsApp chat due to COVID-19 restrictions. The key informants were drawn from the government Department of Agriculture, Non-Governmental Organisations personnel, political leaders who are based in Daluka ward. They were interviewed because they had knowledge of the ward and have participated in several drought interventions.

5.2.2 Age of respondents

In terms of the age range of the household respondents, the survey indicated that 43% of the participants were aged between 41 years and 59 years, 24% were between 31 years and 40 years, 15% above 60 years, 10% were between 26 and 30 years whilst 7% were between 18 and 25 years as shown in Figure 5.2 below. The age range of focus group discussion key informants was not collected, however, all of them were adults over the age of 18 years.

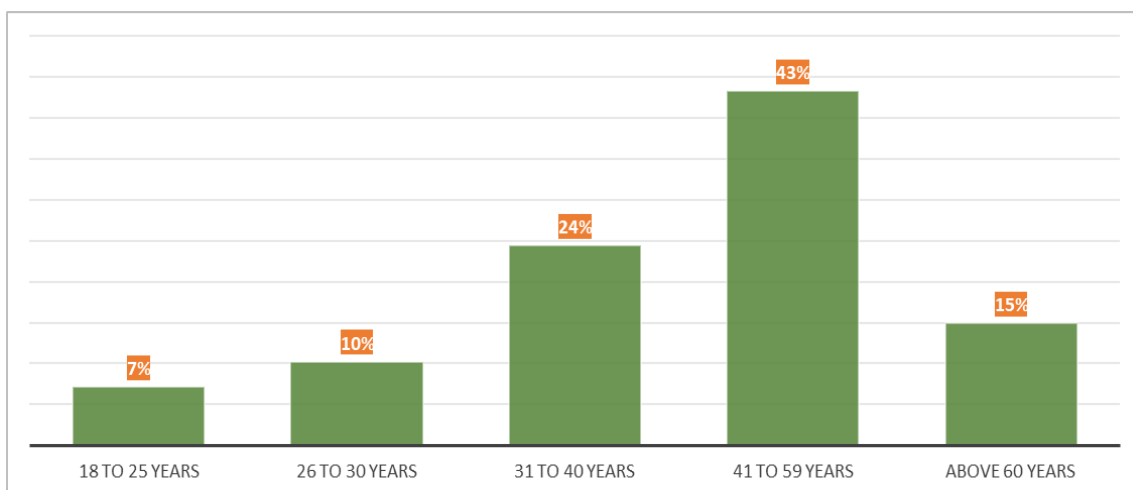


Figure 5.2: Age range of respondents

Source: Survey data

Most participants were aged between 41 and 59 years as this represents family members who participated in different projects in the areas. It is the norm in Zimbabwe and in a rural area like Daluka ward for people aged between 18 years and 40 years to migrate to towns or cities to find jobs hence the low numbers of survey participants who were below the age of 40 years.

5.2.3 Sex of the respondents

Interrogation of the gender of respondents is important in any research because in the African context gender influences communication, participation and decision making. In this case, gender roles and identity often influence the implementation of drought preparedness interventions. In Daluka ward and other traditional families' women influence decisions and implementation of drought management interventions at the household level especially those that are related to food and water conservation. On the other hand, the men often influence decisions and implementation of strategies that affect their extended family and the community at large.

In terms of the gender of participants, the survey showed that 33% of the participants were males and 67% were females as shown in Figure 5.3 below. The gender composition reflects the participation in community projects, which is largely done by women. Normally men will be in cities or neighbouring countries like South Africa or Botswana seeking greener pastures (Ndlovu, 2011). In addition, the survey coincided with food distribution activities, which are largely attended by women.

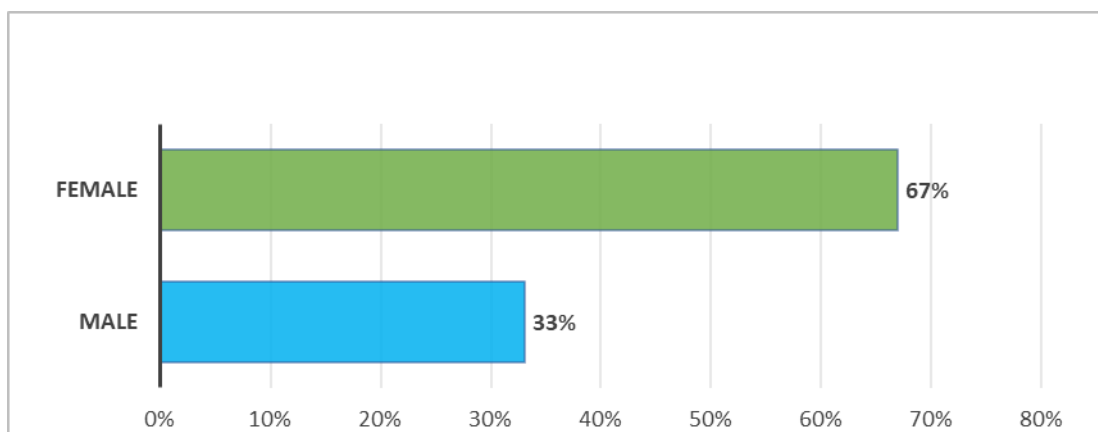


Figure 5.3: Sex of participants

Source: Survey data

In terms of the FGDs, the survey had an almost equal representation of males and female to balance the discussions and to benefit from views from both males (12) and females (12). The Key informant interviews had six key informants five of them were male and only one was female.

5.2.4 The educational level of respondents

The education level of the population plays a role in determining the quality of their decision in drought preparedness (Belle et al 2017). Therefore, the survey collected data on education levels. The results showed that 55% of the survey respondents had primary education as the highest level of education, 33% had reached secondary education level and 2% had tertiary education while 9% had no formal education. It was noted that those who had no formal education were mainly older people above the age of 60 years. The educational level is shown in Figure 5.4 below.

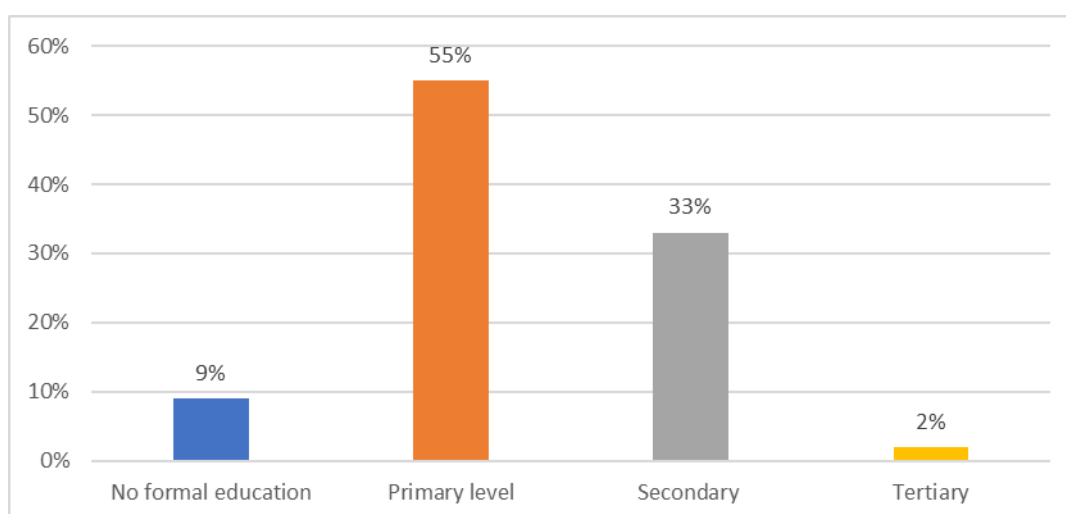


Figure 5.4: Highest education level of respondents

Source: Survey data

According to Jordaan (2012), the study group has basic education, which means they are literate and can understand and appreciate new ideas and concepts that are shared with them. Lack of education limits the understanding of some complex scientific and technical information. To ensure that lack of education did not affect responses mainly from the older people, the interviews were conducted in the local language which is *isiNdebele* making it easy for the participants to fully understand the questions and respond to the questions.

5.2.5 Analysis of the marital status of household representatives

Analysis of the respondent's marital status is important as it addresses the social issues concerning drought preparedness. Social factors like marital status contribute to human capital vulnerability, which is important for effective drought preparedness. The study showed that 57% of the respondents were married and staying with their spouses, 12% co-habiting, 10% widowed, 9% married but not staying together with their spouses and 6% never married as shown in Figure 5.5 below.

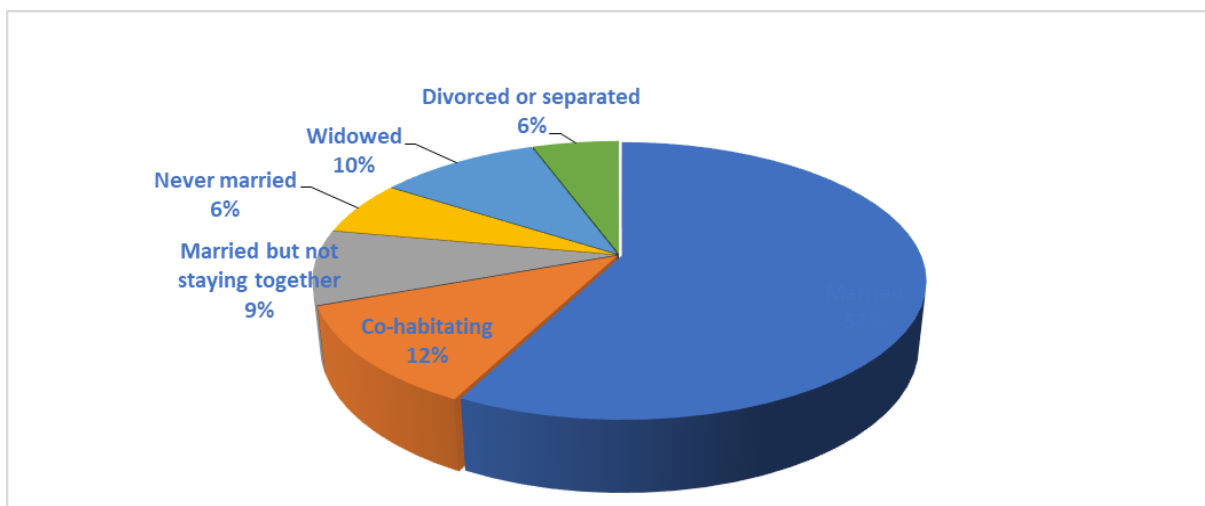


Figure 5.5: Marital status of the respondents

Source: Survey data

People who are married or co-habiting may have the human capital to adopt some drought preparedness strategies like food/water savings as they most likely have children to take care of. On the other hand, households headed by divorced or separated families, widows and unmarried may not have the human and financial capital to invest in drought preparedness and mitigation strategies.

5.3 Hazards frequency and impacts

5.3.1 Hazard frequency

Participants were asked to rank hazards according to frequency over the past five years in their community. First being the most frequent and the fifth being the least frequent hazard in the community. Seventy-one per cent (71%) of the interviewed households representatives stated that drought was the most frequent hazard faced by the community, HIV and AIDS were the second (10%), Veld fire (9%) was the third hazard, pest and diseases (8%). Lastly, on the fourth position is pandemics like cholera and recent COVID-19 was ranged as fifth (2%) as shown in Figure 5.6 below.

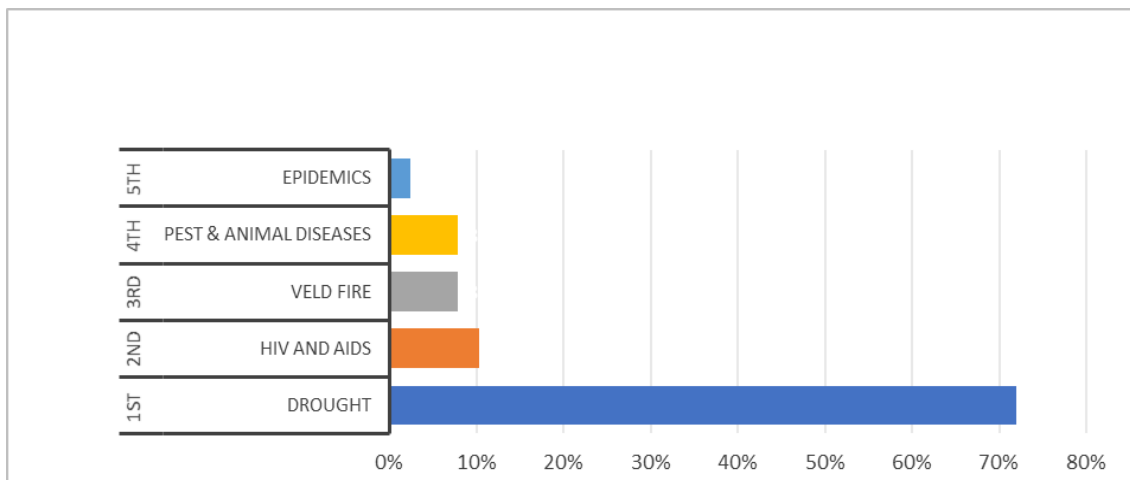


Figure 5.6: Hazard ranking according to the frequency

Source: Survey data

The government of Zimbabwe in the National Drought Plan (2013) also views droughts as the most frequent hazard in the study area. The respondents further stated that drought frequency is increasing, this is supported by Sangombe (2015), IPCC (2007), Gwimbi (2007) who stated that climate change has resulted in an increase in drought frequency in Zimbabwe and other sub-Saharan African countries.

5.3.2 Ranking the impact of hazards

The questionnaire/ households representatives participants and focus group discussion members were asked to rank hazards in terms of impact from high to low over the years. In addition to the reduction in crop yields, increased pests and disease infestation, drought has also contributed to livestock mortality, land degradation, secondary hazards like veld fires, and other economic costs. The response was almost unanimous that drought and veld fire had a high impact, HIV and AIDS had a moderate impact, epidemics, crop and animal pest and diseases had a low impact in the community as shown in Table 5.1 below.

Table 5.1: Ranking hazard impact

Drought	High
Veld Fire	High
HIV and AIDS	Moderate
Epidemics	Low
Pest and Diseases	Low

Source: Survey data

The researcher through a literature review of community-managed disaster risk reduction plans and key informants' interviews also verified hazard ranking. Discussions during focus group discussions showed that although COVID-19 was new its impact would be high in future. Community members noted that COVID-19 had started to reduce their capacity to manage, prevent and mitigate other hazards like veld fire.

The impact of the drought is regarded as high because Daluka community relies on rain-fed agriculture for their livelihoods. According to the National Drought Plan (2013), agriculture absorbs over 80% of all direct impacts of drought. The severity of drought in subsistence agricultural activities in Daluka ward cannot be ignored.

5.3.3 Perception of drought impact over the past ten years

Regarding the perception of the drought impact over the past five years, 106 respondents 83% of the household representatives interviewed stated that drought impact has increased greatly over the years. Eighteen (18) participants stated that it has been increasing slightly and only 3 participants stated that drought impact has not been increasing, but it has been decreasing slightly according to their view as shown in Figure 5.7 below.

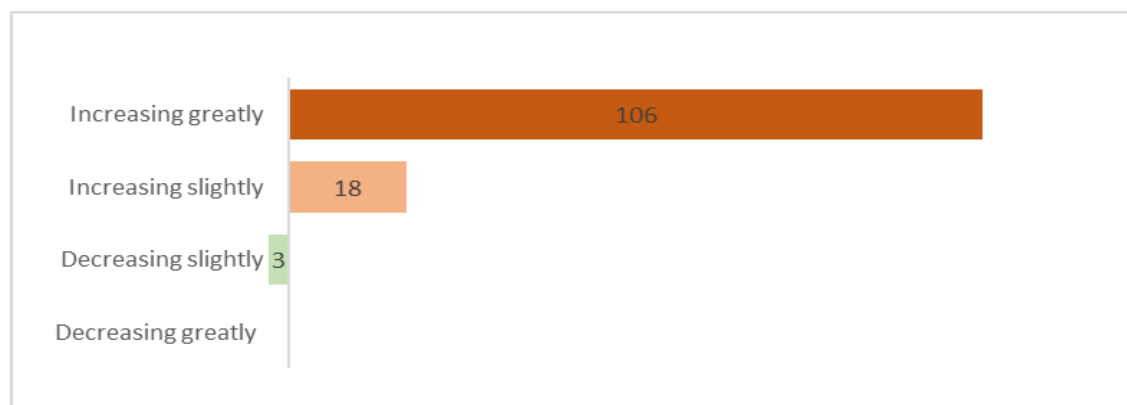


Figure 5.7: Perception of drought impact over the years

Source: Survey data

Focus group discussions also identified soil infertility, poor rains and lack of appropriate inputs as the major causes of drought. Mutasa (2010) also supported this view that poor

soils also contribute to the increased impact of drought as poor soil structure does not conserve water. The key informants felt that there is no wiliness to adopt climate-smart technologies and high dependency as the major causes for the increased impacts of drought.

5.4 Drought preparedness

5.4.1 The general perception of drought preparedness

The research participants were asked a question on their view on drought preparedness in their community. The question followed a Likert scale (*totally prepared, prepared, less prepared and not prepared at all*). Figure 5.8 below shows that 66 survey participants (52%) stated that the community is less prepared, 56 participants (44%) stated that their community is not prepared at all only 5 participants (4%) thought that their community is prepared for drought.

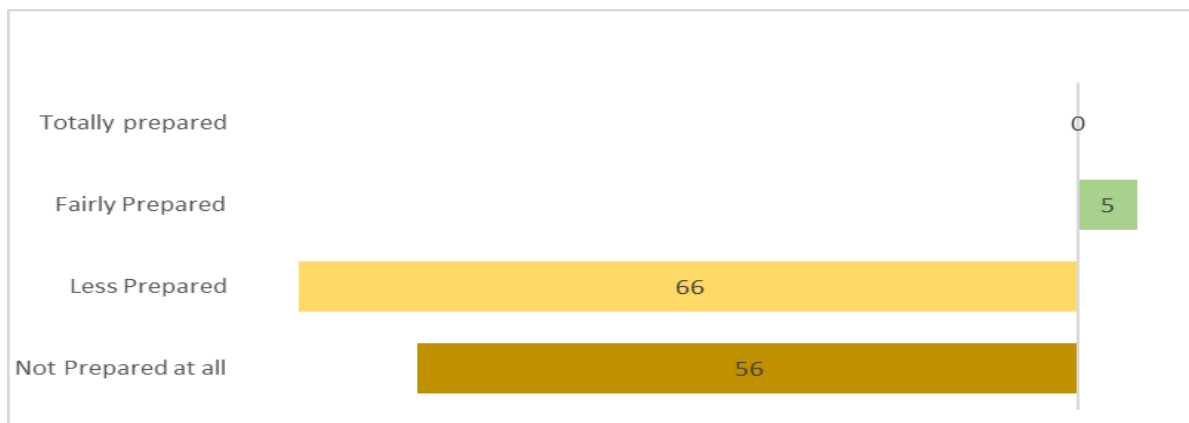


Figure 5.8: Community preparedness to drought

Source: Survey data

A similar question was asked to the focus group discussion participants and the majority over 60% felt that the community is not prepared to deal with droughts. Lack of drought preparedness in Daluka ward mirrors the state of the country in general where Wilhite (2000) concluded that in Southern Africa only South Africa and Botswana have made significant strides towards drought preparedness and there is a general lack of drought preparedness in other countries including Zimbabwe.

5.4.1.1 Major reasons for being less or not prepared at all

Survey participants were asked for reasons why they were less prepared or not prepared at all to deal with drought. Eighty-nine per cent (89%) of the respondents stated that they lack or have limited resources to prepare for drought, 58.3 % stated that they lack information and knowledge about drought preparedness, 35.4% of respondents said they have no institutional support, 32,3% identified late or no early warnings. The lack of clear policy

guidelines according to 18.9% is a problem and 15.7% stated that there was a lack of political will to prepare for drought in the community as shown in Figure 5.9 below.

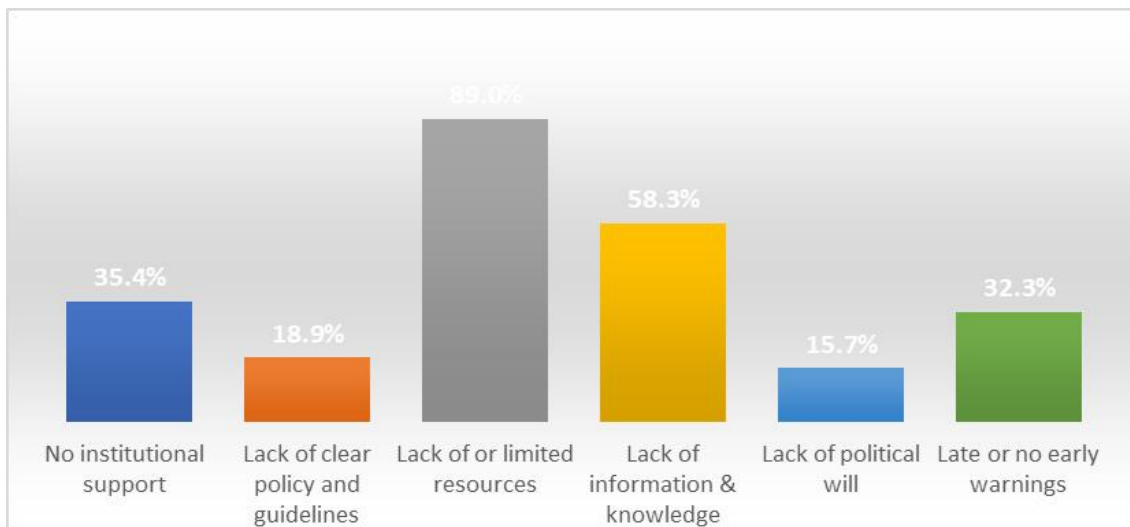


Figure 5.9: Reasons for lack of drought preparedness

Source: Survey data

During focus group discussions and key informant interviews, the respondents identified high levels of dependency syndrome as one of the reasons why Daluka ward is not prepared to deal with droughts. Evidence shows social assistance programmes like drought relief or cash transfers prevents serious negative impacts of drought. However, one of the challenges is that relief recipients become permanently dependent on relief handouts which is dependency syndrome. Key informants also identified unwillingness to change and embrace climate-smart technologies and individualism. Although lack or limited resources was identified as a major challenge, there was a general feeling amongst key informants that the community need continuous support and that could be a sign of dependency syndrome.

5.5 Analysis of drought preparedness effectiveness

This section is discussed following the disaster preparedness framework elements proposed by Kent (1994). The participants were asked several questions linked to each component of the framework to have a detailed understanding of drought preparedness interventions in Daluka ward.

5.5.1 Drought vulnerability assessments

Drought vulnerability assessment is a continuous and dynamic process of assessing drought hazard and risks with the view of preparing to respond to them. According to Kent (1994), vulnerability assessment includes structured data collection and analysis aimed at understating potential threats, needs and resources available to deal with the threats. The

survey participants were asked several questions including, types of those assessments if any, participation, their roles and responsibilities during the assessments. The underlying question was to find out if there is a *habit* of monitoring physical, socioeconomic trends on drought as proposed by Kent (1994).

5.5.1.1 Drought assessments

According to the survey results, drought assessments are carried out in Daluka ward with 31.5% of participants stating they know of drought assessments that were carried out within the past 12 months, 35.4% know of assessments carried out within 24 months, 18.1% remember drought assessments being carried out more than 2 years ago. Fifteen per cent (15%) of the participants did not remember drought assessments being carried out in their community as shown in Figure 5.10 below.

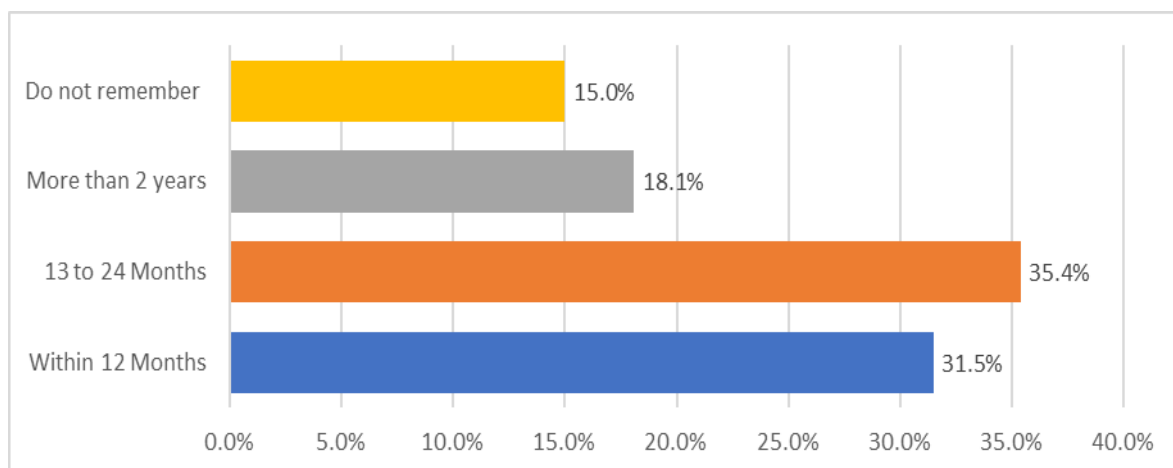


Figure 5.10: Drought assessments

Source: Survey data

Generally, the survey showed that drought assessments have been carried out in the Daluka ward usually by the relevant government authority, and NGOs working in the area. The habit of assessing droughts is fundamental in areas that are drought-prone and can help the community to prepare and plan for an effective response.

5.5.1.2 Types of drought assessments

Furthermore, the household representatives/questionnaire participants were asked to identify specific drought assessments they know, or those assessments are done in their community. Six per cent (6%) of the participants identified the national multi-sector assessment carried annually by Zimbabwe Vulnerability Assessment (ZIMVAC), 47% identified Crop and Livestock Assessment done by the Department of Agriculture and another 47% participants identified NGO/CBOs assessments as shown in Figure 5.11 below;

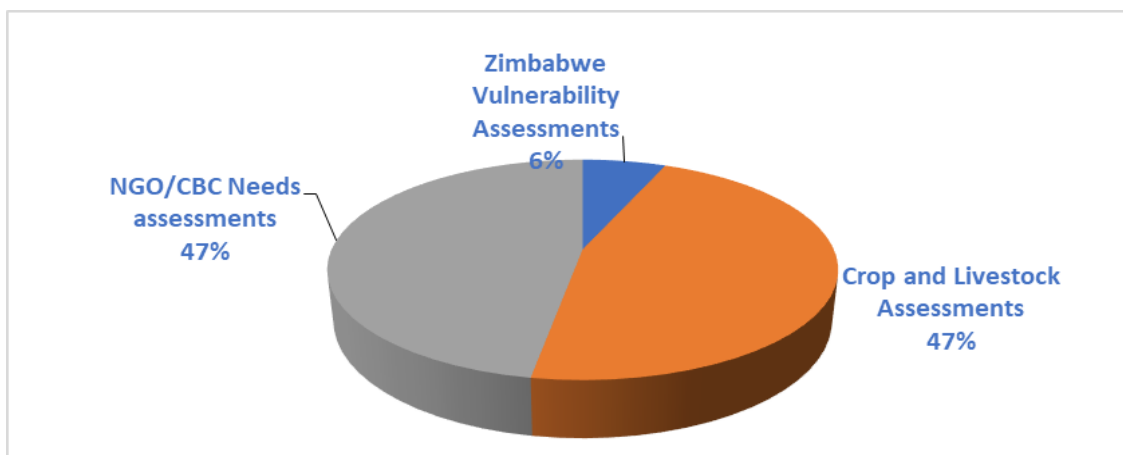


Figure 5.11: Types of drought assessments

Source: Survey data

It was noted that the three main assessments cover most of the sectors and dimensions of drought. Discussions with key informants show that Zimbabwe's Vulnerability Assessment (ZIMVAC) is one comprehensive assessment that covers meteorological, agricultural, socio-economic indicators of drought. However, the issue of concern is the timing of the assessments, which are done between February and April each year whilst the rain season is between October and February. Key informants felt that assessment information will only be useful for drought response instead of preparedness and it will indicate the impact of drought. Daluka community relies on seasonal forecasts, the unpredictability of drought makes it difficult to prepare and the magnitude on a spatial and temporal scale may not be determined until the effects are felt.

5.5.1.3 Participation in assessments

The third step in the 10-step drought planning process developed by Wilhite (1991) is about seeking stakeholder participation and resolving conflict. For any drought preparedness to be effective the participation should be multisectoral and the affected community should be part of the process especially assessments. According to Twigg (2004), participatory risk reduction processes are sustainable as they build the local community's capacity and enhances ownership. Sixty percent (60%) of the participants stated that the government, NGOs and CBOs, does assessments only. Community participation by the public and leaders was stated to be below 30% as shown in Figure 5.12 below.

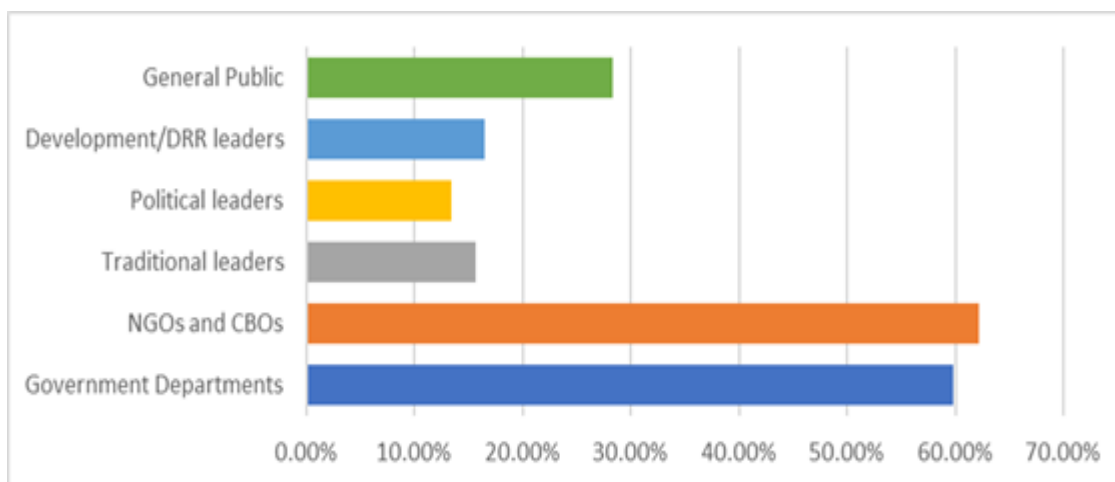


Figure 5.12: Level of participation in drought assessments

Source: Survey data

Although there is some participation, the key informants and focus group participants felt that the private sector as a subsector of the general public is not involved in drought assessment and response in general. Excluding the business community from assessments means that community members have limited information of possible drought impact of economic activities and in the end do not prepare adequately.

Affected communities understand, observe and adapt to these factors in ways that external decision-makers and experts cannot fully experience. Learning from the experience of affected communities is the best way for drought managers to test the effectiveness of an assessment method. Observing and analysing the experiences of the past and from different locations can help avoid oversights and recurring mistakes. These groups are also often the ones that have the greatest knowledge and experience of drought impacts and vulnerability. These are informed by their strategies for mitigating drought impacts and vulnerability. To collect this knowledge and experience and convey it effectively to a decision requires a bottom-up approach. In Daluka, the research also showed that during droughts they also experience an increase in veld fires due to dry biomass and heat. The researcher, therefore, recommends a multi-hazard assessment to be done.

5.5.1.4 Common roles of general community members in drought assessment

When asked about the roles played by community members during drought assessment, 83.1% of the respondents stated that community members are generally used as interviewees, 8.7% stated that they were used as data collectors, 3.1% said the public sometimes guide the assessment process and 5.1% stated that they do not have any role as depicted in Figure 5.13 below



Figure 5.13: Role-played by community members in drought assessment

Source: Survey data

The survey also noted that 70% of the respondents stated that questionnaires are the main drought assessment data collection technique. Less than 10% of the respondents stated that focus group discussions, key informant interviews and other participatory techniques like transact walks, scoring, scenario mapping are used. Lack of participatory techniques in data collection makes it difficult, limits general participation in assessments, and reduces their ownership of the process.

What also makes the community sidelined is that 70.9% of survey participants stated that data collectors are not local people, 52.8 % of the participants felt that all the data collectors have limited or have no knowledge of their community. The passive role played by the affected communities in drought assessment is one of the sources of mistrust of the results. A passive participation in drought management activities means that the community participate by being informed of what has been decided and they follow instructions from above. The decisions are done by the project management team which is mostly external professionals from NGOs and government departments.

5.5.2 Planning for drought

Drought planning is an important process to ensure that stakeholders can work collaboratively and follow clear agreed guidelines. According to Kent (1994), planning is essentially the theme of disaster preparedness. The objective of planning is to have an implementable, agreed plan where different stakeholders can commit resources. The community-level plan is usually guided by provincial and national plans. Wilhite, Hayes and Knuston (2005) stated that the objective of the drought planning process is to meaningfully change the way people prepare for and respond to drought by putting greater prominence on risk management and embracing appropriate mitigation intervention. The survey

participants were asked whether there is a drought plan in place, the process of drought response planning and how the drought response planning was done.

5.5.2.1 Drought plan/preparedness plan

When asked about the existence of a drought plan, 87% of the respondents said there is no drought plan, 10% stated that they do not know if there is a drought plan, only 3% said it was available as shown in Figure 5.14 below.

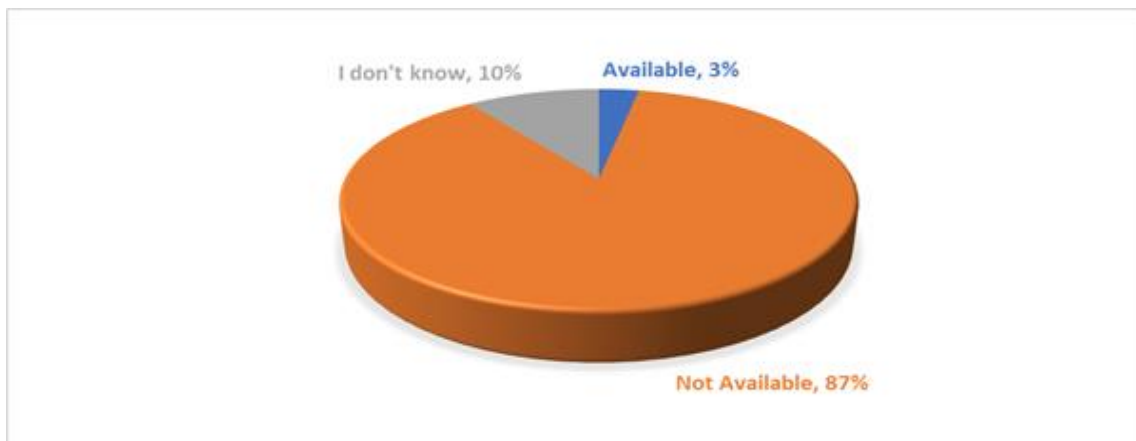


Figure 5.14: Presence of drought plan

Source: Survey data

A drought plan is generally a preparedness plan as this is done before droughts and based on previous drought events. Therefore, the lack of a drought plan means that the community does not have guidance on how to prepare for droughts. Lack of a drought plan makes it difficult for the community to respond to drought. Discussions with the community showed that planning is only done when drought events start to manifest.

(i) Drought response planning process

The unpredictable nature of drought means that the drought preparedness plan is not sufficient for an effective response. This researcher is of the view that even if the drought preparedness plan is in place there is a need for drought response planning when drought effects are in motion. The response planning process includes a review of the preparedness plan, allocation of resources, gap analysis in the communities' capacities, development of a continuous communication system, the establishment of drought impact monitoring and evaluation system. The survey showed that 46% of the respondents stated that when drought is declared drought response activities are initiated, 33% said there is no planning and 21% said they did not know as shown in Figure 5.15 below.

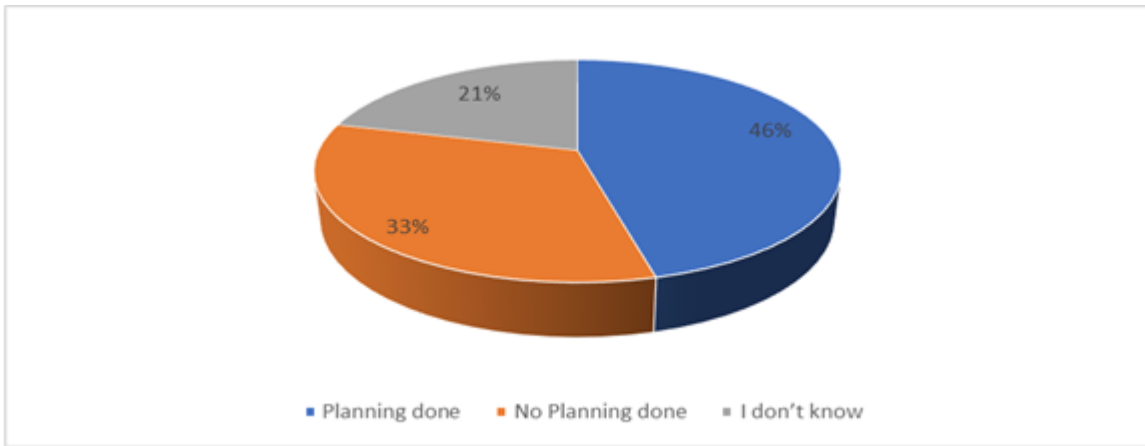


Figure 5.15: Drought response planning

Source: Survey data

The analysis shows that some people do not know if the response is planned and think the response is uninformed and depends on available resources and political power dynamics in the community. According to the focus group discussions, those who felt that there was no drought response planning identified delays and inadequate responses as reasons for their response.

(ii) Level of response planning

The survey participants were asked at which levels drought response planning were undertaken. Fifty-five percent (55%) of the participants said drought planning happens at the district level, 41% said it happens at ward level and 4% of the respondents stated that drought response planning happens at the village level as depicted in Figure 5.16 below.

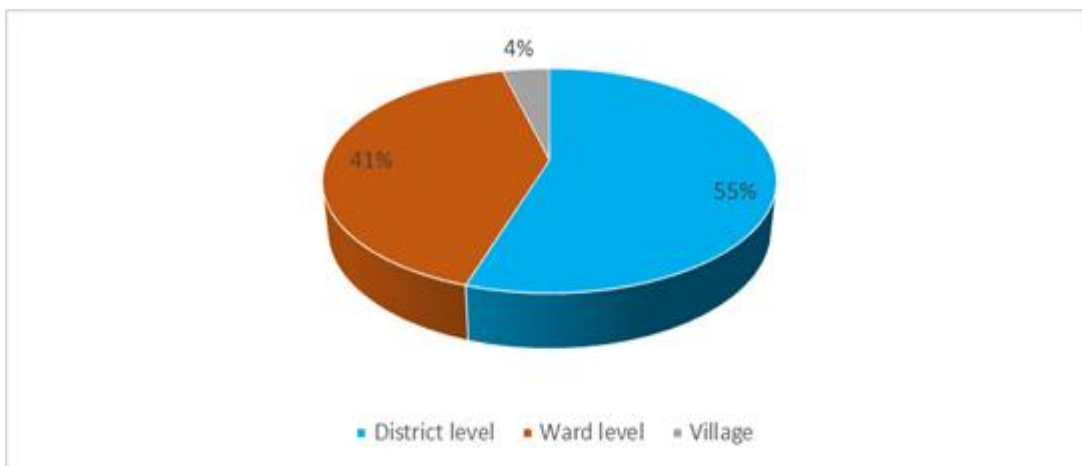


Figure 5.16: Levels of response planning

Source: Survey data

According to Kent (1994), “*planning is not simply the work of experts*”, it should involve the local people, the ones who bear the brunt of the drought. The survey showed that in the Daluka ward drought planning is mostly done at the district and ward level. Focus group

discussions indicated that at the village level members feel that their views are not considered when planning as demonstrated by inequitable distribution of response resources, delays and politicisation of response.

5.5.3 Institutional framework

According to Burke and Kent (2014), “*the nature of organisational behaviour often presents major barriers to effective hazard identification and appropriate measures*”. Analysis of the institutional framework in drought preparedness is important as it relates to the coordination of preparedness and response activities. According to Kent (1994), a disaster preparedness plan will quickly deteriorate unless there is vertical and horizontal coordination. Horizontal coordination is the coordination amongst various line ministries, departments at both local and national level, whilst vertical coordination is between the national and local authorities. According to Wilhite et al. (2007) droughts cuts across many disciplines, it is important to have a strong and transparent institutional framework that will ensure that policies and guidance from multi-sector top-level trickles down to the village and household level.

5.5.3.1 Availability of institutional framework

The drought task force/committee is one of the institutional frameworks that are important for horizontal and vertical coordination and connects the district, provincial and national drought coordination mechanism. The survey responses show that 77% of the respondents said there is a drought task force/committee, 13% said it's not available and 10% said they did not know if there is a drought task force/committee as shown in Figure 5.17 below.

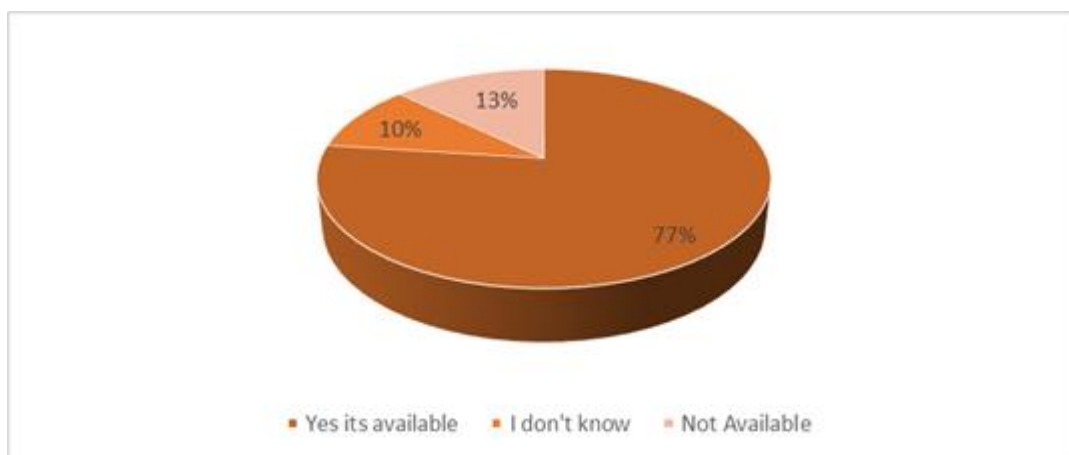


Figure 5.17: Availability of drought taskforce/committee

Source: Survey data

According to Wilhite (2005), the key political leader at each level of government should establish a task force. In Zimbabwe, the task force is called a committee established by political figures at national, provincial, district and ward levels. The results show that many

people in Daluka ward are aware of the drought task force/committee. This means that different government departments NGOs and other interested groups meet at various levels to prepare and coordinate drought response.

5.5.3.2 Levels of drought taskforce

The survey participants were asked about the level of drought task force/committee. Seventy percent (70%) of participants stated that drought task/force/committee is present at the ward level. Eighteen percent (18%) said it was also active at the district level and the other 18% said it was at the village level as shown in Figure 5.18 below.

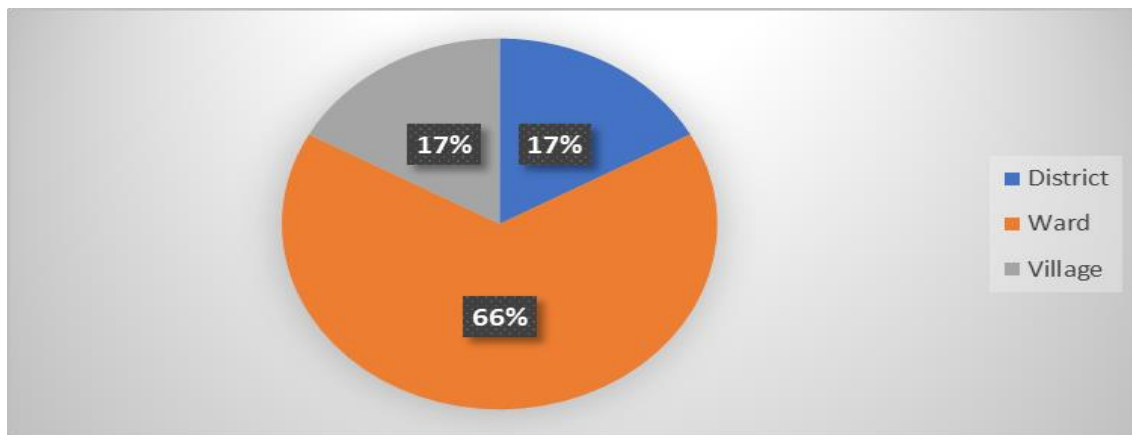


Figure 5.18: Level of drought taskforce/committee
Source: Survey data

5.5.3.3 Constitution of the drought task force/committee

The drought task force/committee should reflect the multidisciplinary nature of drought and its impacts (Wilhite, 2000). The participants were asked if they are aware of members who constitute the taskforce/committee members, 58% of participants stated that they are traditional leaders, 44% said councillors/political leaders, 32% said government representatives are part of the task force, 24% said NGO/CBOs participate as shown in Figure 5.19 below. Figure 5.19 also shows that 12% of respondents said special groups like HIV and AIDS home-based care groups, representatives of farmers amongst others were part of the drought task force/committee.

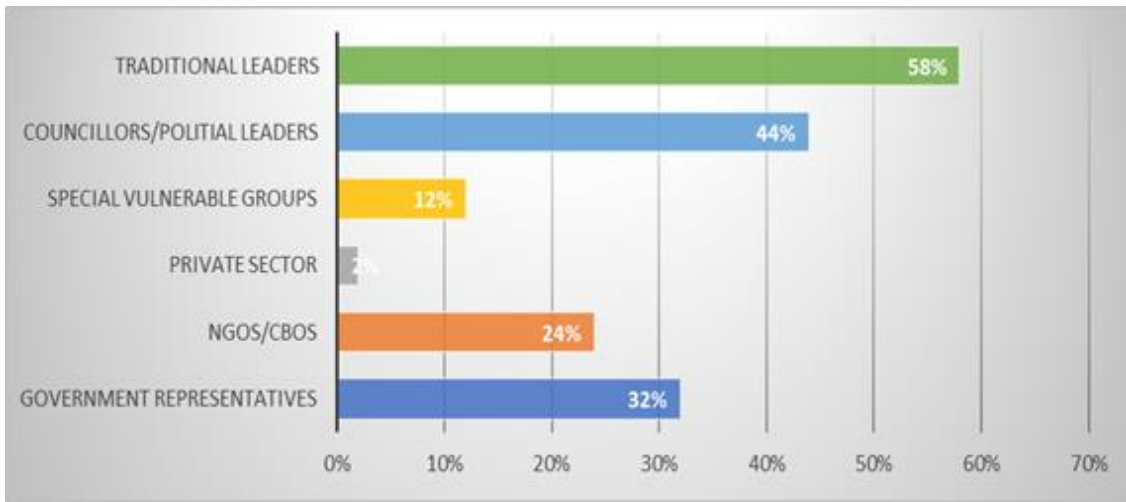


Figure 5.19: Drought taskforce/committee

Source: Survey data

During the focus group, discussion members highlighted that they were not aware that the private sector would play an important role if they are included as members of the task force. Only 2% of the respondents identified the private sector as participants of the current drought task force/committee. Ignoring the private sector and business is ignoring essential capital in disaster preparedness. Involving the business sector in drought risk management does not only unlock the business social responsibility drive but also helps in analysing drought in a multi-dimensional manner. Wilhite (2000) emphasised that drought is an interdisciplinary problem and it requires input from many disciplines and policymakers.

5.5.4 Information system

An effective drought early warning system is an important element to improve drought preparedness. Early warnings should be done timeously and using reliable data (Wilhite, Sivakumar and Wood, 2000). Early warning systems include information from the Meteorological Department, Agricultural Department, and community's traditional system. According to Kent (1994), for disaster preparedness to be effective, various inputs from different departments need to be coordinated. To reinforce the importance of information Wilhite and Svoboda (2000:12) emphasised the need for a clear "*organizational structure and a delivery system that assures information flow between and within levels of government*". The survey participants were asked how assessments reports from different departments were shared, their main sources of early warning information, use of traditional early warning systems and the degree of trust they have in the early warning system.

An effective early warning system provides adequate, timeous, accurate, relevant, and free weather information (Van Zyl, 2006). Kent (1994) further stated that warning systems relate to communication channels that are available to the community before and during a disaster. A preparedness plan should therefore outline communication channels and alternatives in case they are affected by the hazard.

5.5.4.1 Drought Information dissemination

Chitongo (2013) argues that if there are effective drought forecasting and monitoring then the community's adaptive capacity can be enhanced for proactive drought management. In that vein, the survey participants were asked if information from drought monitoring, vulnerability assessments, impact assessments, crop and livestock surveys is shared with the community in general. Twenty-four percent (24%) of the respondents stated that the information is shared, 70% said information is not shared and 6% said it is not shown in Figure 5:20 below.

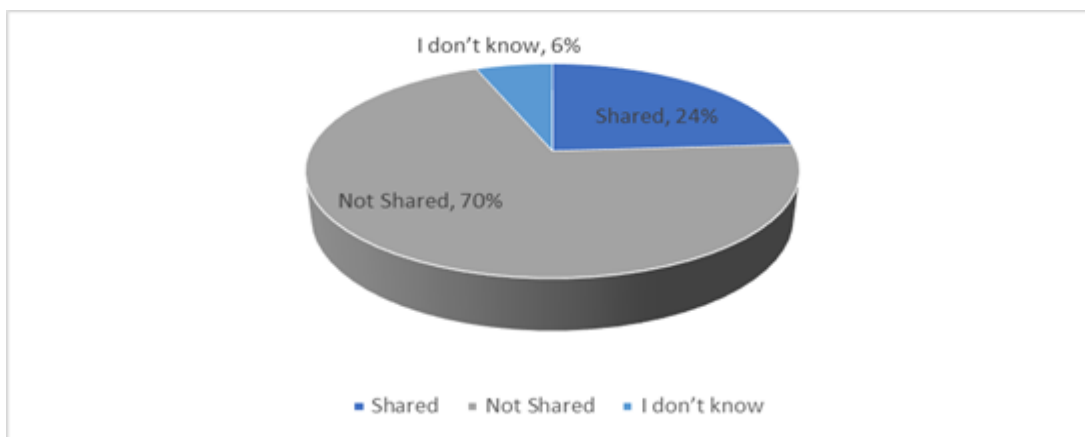


Figure 5.20: Sharing of assessment results with the community

Source: Survey data

Sharing of assessments results ensures that the community knows what to expect, the possible impact of drought and elements at risk. Assessment results enable the communities to start drought preparedness activities, mobilise resources and seek guidance on how the negative impacts could be mitigated. Some focus group discussion members stated that they are always suspicious of government and NGOs if they do not share the assessment results with the entire community.

5.5.4.2 Main sources of drought early warning information

The provision of reliable climate data is critical for drought planning and supports communities in decision-making (Wilhite and Svoboda, 2000; Van Zyl, 2006). Therefore, sources of drought early warning information are critical. Survey participants were asked to identify their main sources of early warning information generated by meteorological services or the government. The survey results show that 81.1% of survey respondents stated that their main source of weather and early warning information is agricultural extension services. NGOs and CBOs were identified by 33.1%, 31.5% said it from meteorological services directly, 37.8% said that their main source is public media like radio and newspapers, 28.3%

said their source is traditional leaders and 15.7% said their source is social media as depicted in Figure 5.21 below.

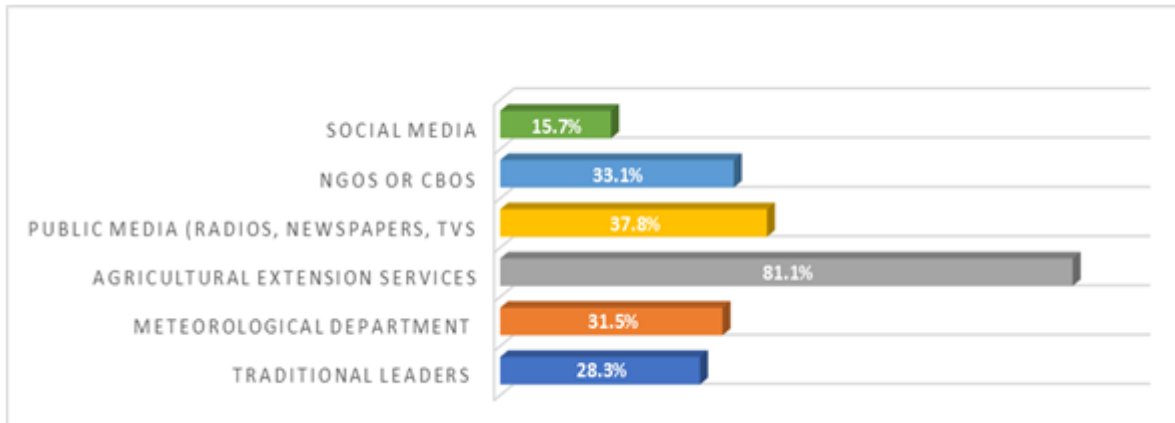


Figure 5.21: Main sources of drought early warning
Source: Survey data

5.5.4.3 Use of traditional early warning systems

The survey participants were asked about the use of the traditional warning systems, 48% of participants said they sometimes use traditional early warning systems, 35% said all the time and 17% said not at all as shown in Figure 5.22 below

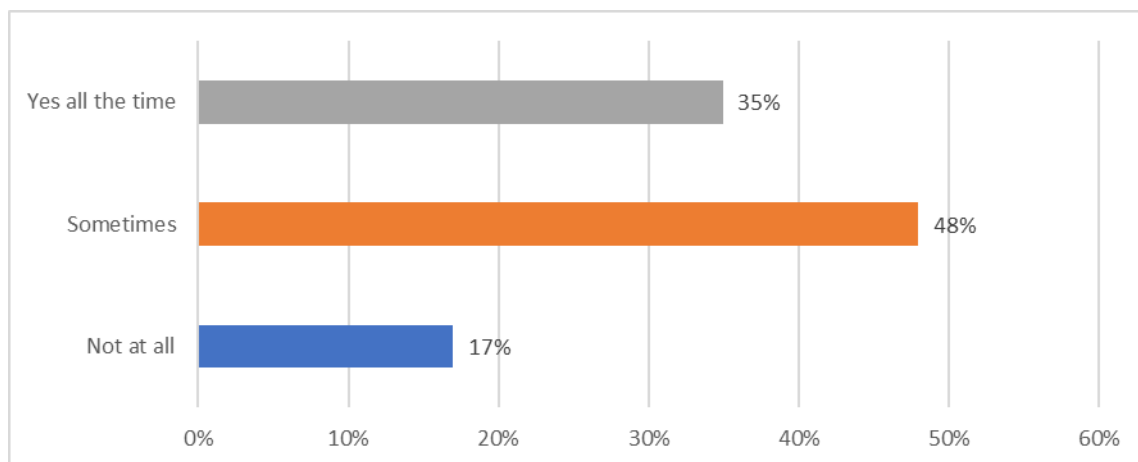


Figure 5.22: Use of traditional early warning systems
Source: Survey data

Focus group discussions show that communities sometimes rely on wind direction, birds flying direction and tree shading leaves to predict and forecast droughts in the community. However, participants stated that although they use traditional early warning system they do not rely on traditional early warning system and they as they are often discouraged by the external professionals from government and NGOs.

5.5.5 Resource base

Wilhite and Easterling (1987) identified important resources need to adequately prepare or respond to drought at political, institutional, human and budgetary resources. The identification of important resources required for drought response including proper plans on how to acquire them is necessary for effective drought preparedness and mitigation. The survey participants were asked about the resources for drought preparedness and response. The responses were in a Likert scale format (*always available, sometimes available, hardly available and not available at all*).

5.5.5.1 Community own financial resources

The survey results show that 58% of the participants said that community resources for drought preparedness and response were not available at all, 27% said the resources are hardly available. On the other hand, 12 % of participants said sometimes the resources are available from a few members, 3% of participants said resources are always available for preparedness as shown in Figure 5.23 below.

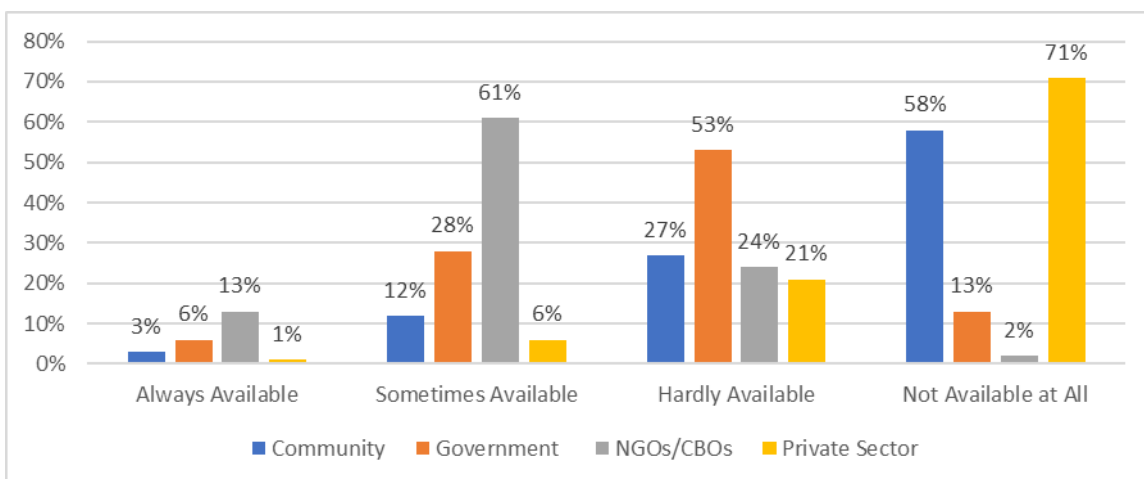


Figure 5.23: Availability of drought preparedness and response resources

Source: Survey data

Those who said the resources are sometimes available identified water points like boreholes, rivers as the resources that are in the community. However, they were quick to highlight the challenges of adequate skills and political will amongst other community leaders to manage the water points for them to help mitigate droughts.

5.5.5.2 Availability of government resources

The survey participants were also asked about the availability of government resources to improve preparedness and respond to drought. As shown in Figure 5.23 above, 13% of participants said government resources were not available at all, 53% of participants said the

resources are hardly available, however, 28% of participants said resources are sometimes available and 6% of participants said resources are always available.

The survey participants who said government resources are hardly available stated that government response takes time to reach the community and it is always limited making it difficult to prepare. The key informants stated that government resources are mainly for drought response and limited resources are earmarked for preparedness. On the other hand, the government provides skills training, early warning information as part of preparedness intervention. The community also identified government resources in the mitigation of drought impact through drought-resistant seeds support and rehabilitation of water points.

5.5.5.3 Availability of NGO/CBO resources for preparedness and response

When asked about the availability of resources from NGOs/CBOs, 61% of survey participants said resources are sometimes available, 13% of the participants said NGO/CBO resources are always available, however, 24% of participants said resources are hardly available, and 2% of the participants said it is not available at all as shown in Figure 5.23 above. Survey participants identified some organisations that are within the community doing DRR activities as having resources for preparedness and contribute largely to response through material, cash and skills resources.

5.5.5.4 Availability of private sector resources

The private sector like local businesses has a role in drought preparedness and response in Daluka as they are also affected by drought. Survey participants were asked if the private sector avails resources for preparedness and response. Seventy-two percent (72%) of the respondents stated that resources are not available at all and 12% said resources from the private sector are hardly available. Focus group discussions noted that the business community in Daluka do not avail resources in general. Some participants however said that some business people provide storage facilities during drought response interventions.

5.5.6 Response mechanism

Response mechanism relates to the strategies that are employed by communities to respond to drought threat or actual drought disaster. The survey participants were asked about the drought response mechanisms. The responses are shown in Figure 5.24 below. The survey results showed that 70% of the population sometimes stockpiles or conserves food after they receive information or warning about drought, 45% said they sometimes send livestock to areas where there are better sources of water and pasture, 46% seek guidance

from experts like agriculture extension workers, 49% plant drought-resistant crops like small grains. Fifty-four percent (54%) of the respondents said they always appeal for food and cash assistance from the government and NGOs in the area as a form of preparedness.

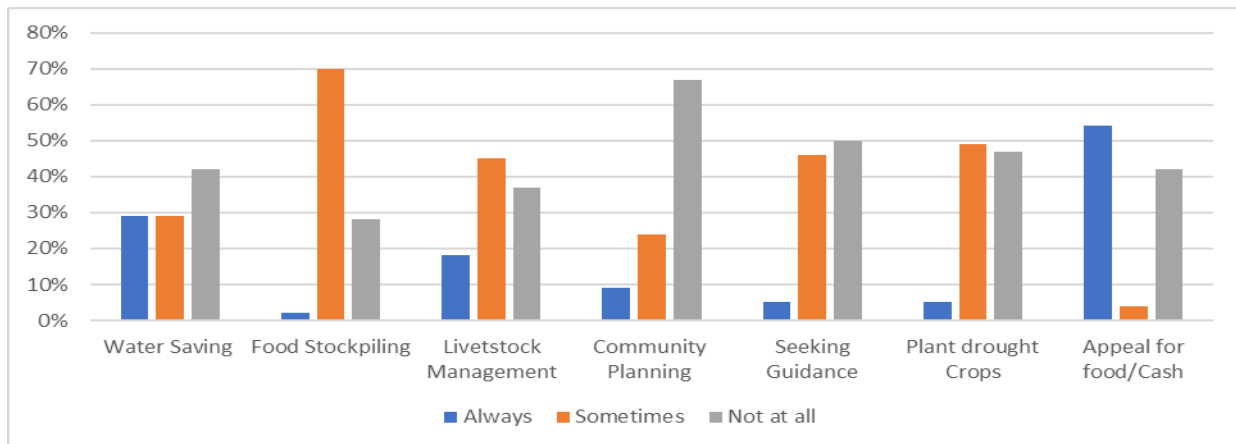


Figure 5.24: Response mechanism strategies

Source: Survey data

Only 2% of the participants say they stockpile food, 5% said they always try to come together and plan as a community and 5% plant drought-resistant crops. Focus group participants gave several reasons. Poverty in the area is high, thus, they do not stockpile food, lack political will to work together and that there is resistance to small grains, which are drought resistant in the community. Key informants also identified mixed messages that are given by NGOs and other donors in the area around small grains and conservation agriculture.

Daluka ward, like any other drought-affected area in Zimbabwe, receive drought assistance, there is a consensus in drought and food assistance but that relief is poorly coordinated, untimely and ineffective.

5.5.7 Public education and training

Waugh (2000) underscored the importance of public education and training by stating that it is not only fundamental, but it assists in disaster preparedness.

5.5.7.1 Drought related training received

The survey participants were asked about public education and training. Eighty-seven percent (87%) of the participants stated that they received drought-related training, 12% said they have not received any training and 2% did not remember if they received some form of training as shown in Figure 5.25 below. Further asked on who provided the training, 74% of the survey participants said they received training from agricultural extension workers and 18.1% from NGOs and CBOs operating in the area.

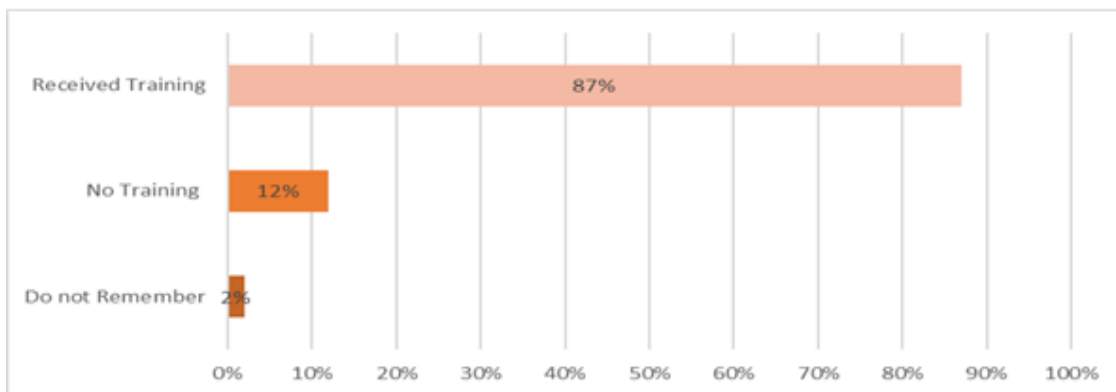


Figure 5.25: Drought related training received

Source: Survey data

5.5.7.2 Type of training and public education received

Survey participants were asked about the types of drought-related training they received. More than 80% of the survey participants stated that they have received conservation farming techniques and drought-resistant crops. Fifty percent (50%) of the participants received training on climate change, 40% on early warning systems, less than 25% of survey participants said they have received training on water/food conservation, drought preparedness planning and drought response planning as shown in Figure 5.26 below.

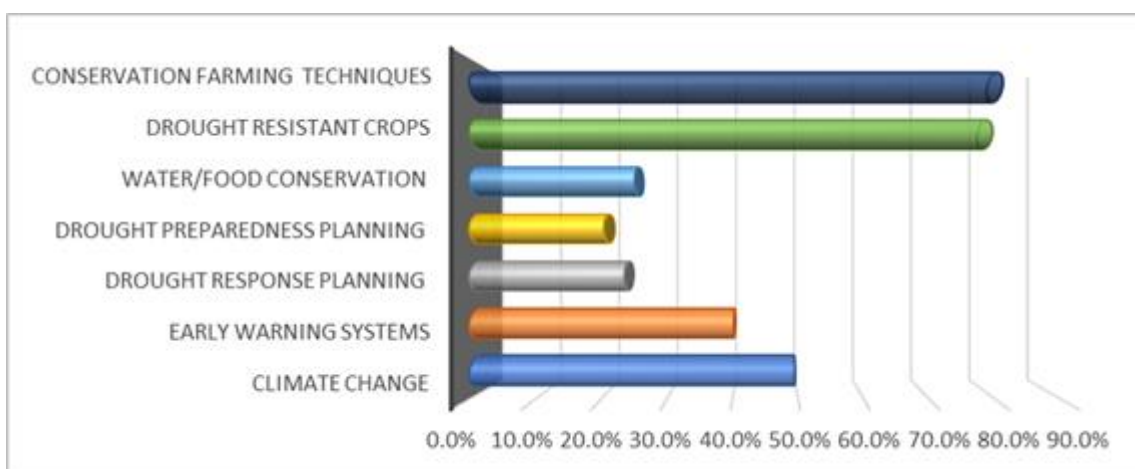


Figure 5.26: Types of drought-related training received

Source: Survey data

Given that the community's main sources of information come from agricultural extension services most of the training was largely related to agriculture as seen in Figure 5.26 above. Discussion with key informants and community members during focus group discussions showed that government and NGOs have introduced conservation activities such as agro forestry, contour ridges and minimum tillage. Conservation activities are commendable for drought risk reduction as confirmed by Chipindu (2008) who stated that they are not only important for development but they promote drought management.

CHAPTER SIX: CONCLUSIONS & RECOMMENDATIONS

6.1 Introduction

Chapter six presents conclusions on the main findings outlined in chapter five above. Furthermore, practical recommendations are made on the interventions and gaps identified in achieving drought preparedness for effective drought response. In outlining recommendations, Kent (1994) drought preparedness framework elements are applied, and the researcher feels they are comprehensive to achieving drought preparedness. Suggestions for further studies are made before the concluding remarks.

6.2 Conclusions

The research focused on why there is a lack of drought preparedness for effective drought response in the Daluka ward despite various interventions. The study explored the effectiveness of various interventions carried out in the name of drought risk management and preparedness in the area. Using Kent's (1994) preparedness framework the study explored each element and noted that there is a need to strengthen some interventions to improve the effectiveness of drought preparedness. Generally, in Daluka ward vulnerability assessment, an institutional framework is in place but there is a need for strengthening these interventions and ensuring participation of the local community at all levels.

Regarding drought planning, information and warning systems, resources base and public education the research concludes these elements are the major drivers of lack of preparedness in the community. A reactive approach to planning, delays in early warnings, dependency syndrome and lack of multi-dimensionality in approaches to preparedness hinder communities to prepared adequately for drought. Subsequently, the lack of preparedness affects drought responses.

6.2.1 Summary of the research findings

This section gives a summary of the research findings and conclusions based on the analysis and discussions above. The general finding is that lack of effective drought preparedness emanates from the number of gaps in addressing elements of preparedness to achieve effective drought response. The findings are therefore summarised as follows.

6.2.1.1 Increasing frequency and impact of drought

The survey showed an increase in drought frequency and impacts in low rainfall areas (Zimbabwe's agro-ecological region IV) in a country that has been facing economic meltdown for the past two decades which has eroded absorptive, adaptive and transformative capacities of rural communities. In Daluka ward like all other rural wards in

Matabeleland provinces, drought impacts affect water supplies more. The shortage of water has affected all spheres of human activities, environmental health and developmental projects. Although the community does not have adequate knowledge of climate change, there is acknowledgement and consensus amongst them that weather patterns have been changing and these changes have contributed to the increasing frequency and impact of drought.

6.2.1.2 Centralisation of the drought management function

The research found that drought management is centralised with management power concentrated more at the national and provincial level. The central nature of drought management makes it difficult for community members at the ward or village level to contribute to drought preparedness. Chitongo (2013) argues that the centralisation of the drought management function makes the participation of the affected local population in drought preparedness difficult. This conclusion is also supported by Chigodora (1999) who observed that contributions to drought management and preparedness in Zimbabwe by other spheres of government appear to be just ceremonial. The central nature of drought management creates challenges especially from ward level downwards. It creates suspicions especially in the politically polarised environment currently prevailing in Zimbabwe. Unclear policies and lack of preparedness plans make coordination of drought preparedness and response activities difficult. Mushore et al. (2015) concluded that government departments and non-governmental organisations often show a lack of capacity to implement and coordinate drought response every time drought strikes.

6.2.1.3 Lack of and passive participation in the drought vulnerability assessment process

The survey showed that although government and NGOs carry out assessments the assessments lack community participation especially from the village level and private sector. Most community members are regarded as interviewees and data collection techniques do not promote the participation of the community. Data collectors are regarded as government or NGO personal or even outsiders affecting the acceptance and trust of the assessment results.

6.2.1.4 Top-down planning process as opposed to locally-led drought planning

Although drought plans are developed from the national level down to the community level, at the village level there seems to be limited contribution. According to the community at the ward level, drought response planning is influenced by resource allocation by the government and NGOs. Top-down approaches are seen to be influenced by the political

expedience that comes with drought relief activities. Participation does not only focus on actual data collection but the community members need to be involved in data analysis and receive feedback from the assessment.

6.2.1.5 Limited role of the private sector and those affected by drought

Although private sector like businesses can be classified under the general public, their roles are a bit different because they have the financial capacity unlike other members of the community. The research showed that there is a limited role played by the private sector and those affected by drought. Although Daluka ward is located close to Kenmaur business centre there is limited involvement of the business community in drought preparedness and response. Limited or non-involvement of local business deprives the community of some financial and material resources and creates the view that drought preparedness and management is the role of government and non-governmental organisations.

6.2.1.6 Limited resources and high dependency syndrome

There are limited resources allocated for drought preparedness and response, there is no community-driven resources mobilisation strategy to deal with drought. Every time there is a drought the community appeals to the government and NGOs for assistance. Drought food assistance has been going on for many years and communities depend heavily on government and NGOs. Edward and Mackee (1997) stated that drought relief activities are post-impact which reinforces the status quo. Continuous drought relief activities help to perpetuate societal vulnerability to drought by creating a dependency syndrome. In Daluka, communities feel that they are entitled to food assistance during a drought season and they neglect their role in preparing and planning for drought. It can be argued that social protection is the role of government, the researcher feels that community contributions to solving their challenges are essential to reduce dependency.

6.2.1.7 Lack of trust in early warning and inaccessible information system

Nangombe (2015) concluded that Zimbabwe's drought early warning system is non-existent or not very effective and this research noted challenges in early warning systems. However, the researcher noted that the provincial meteorological department together with developmental partners has established remote weather stations and drought monitoring strategies. Drought early warning is supported primarily by the Department of Agriculture, which increases community awareness on drought through the farmers. Early warning is further complemented by traditional methods like wind, direction, rainmaking ceremonies and ancestral consultations. Chipindu (2013:13) reiterated the role of traditional early warning systems by saying, "*it is in this context where one can nullify the modernisation*

discourse's preoccupation with the repudiation of African traditional culture on the basis that they were inimical to development".

6.2.1.8 Reactive response mechanisms instead of proactive strategies

According to Chitongo (2013), there is an emphasis on crisis management, society has generally moved from one disaster to another with little if any, risk reduction. The researcher notes that this strategy could be the one that perpetuates dependency syndrome. Late and limited propagation of early warning information impedes proactivity forcing communities to react to droughts. The research also noted that there are no preparedness measures that are built in the drought response interventions as suggested by Brüntru and Tsegai (2017), who state that drought interventions should always include preparedness measures for future drought cycles. Daluka community is not doing much to conserve water although conservation of water is considered as a powerful drought mitigation strategy (Hayes and Svoboda, 2005).

6.2.1.9 Limited public training and capacity building

Most public training and capacity building activities are done by agricultural extension services, so they are mostly agronomy based like conservation agriculture. Other departments like Water, Social welfare do not carry out training or public awareness making communities see drought as agricultural drought only.

6.3 Recommendations of the research

6.3.1 Multi-dimensional preparedness planning

Drought calls for multi-dimensional preparedness planning as proposed by Burke and Kent (2014). In addition, drought preparedness and response are not solely the work of experts and emergency responders from government and humanitarian organisations. The planning process should include all sectors including the business sector and affected communities. There is a need for participation by the communities through their leaders and special interest groups like HIV and AIDS focal persons and the disabled amongst others. All government departments should participate in the planning process, currently, the Department of Agriculture seems to be at the forefront of working with NGOs. Lack of participation by other departments like Health, Water, Meteorology and business sector makes the community believe that drought is an agriculture problem.

6.3.2 Decentralised drought risk management

There is a need to decentralise drought risk management and ensure that village and ward institutions and structures are capacitated. The starting point is for the taskforce/committee

to be capacitated and local people to be involved. There is a need to create a village taskforce that will feed into the ward and district task force. Lack of a village taskforce and limited participation of the community leaders creates suspicion and conflict within the community. There is a need for government and NGOs to clarify the roles and responsibilities of the task force members and to ensure the roles are not only focusing on drought response.

6.3.3 Accessible and timely information and warning systems

Information systems should be accessible to communities and allow for preparation time. Time is a factor of effective preparation so early warning information should be given to the community in time. To improve trust and uptake of early warning information the communities need capacity building, participation and integration of indigenous information together with scientific weather information.

6.3.4 Set up preparedness resources

The government and NGOs operating in Daluka wards should follow the suggestions made by the Global Platform for Disaster Risk Reduction 2009 that 10% of humanitarian funding and at least 1% of development funding goes to risk reduction (UNDP/BCPR, 2013). Communities should also initiate strategies to mobilise preparedness financial and material resources.

6.3.5 Pro-active response strategies

To reduce the impact of drought and ensure that the community is better prepared when drought strikes, preparedness and mitigation strategies should be emphasised by the government and NGOs. Too much emphasis on drought response strategies like food aid has not only created dependency but has undermined human social capital like collectivism and social networks that exist in the community. The research identified the lack of political will and individualism as challenges created by government and NGO interventions.

6.3.6 Comprehensive public education and training on drought

The researcher reiterates the need for information dissemination, public education and awareness from the national to the village level (Hayes and Svoboda, 2005). Public education and training should encompass all other sectors like water, socio-economic, environment and climate change. Modules of drought risk management training should be developed by all the sectors to address the multi-dimensional aspect of drought. The current emphasis in drought preparedness and mitigation is on using agricultural strategies.

6.4 Summary of recommendations

Table 6.1: Practical recommendations to improve drought preparedness in Daluka ward

Recommendations for Effective Drought Preparedness		
<p>Vulnerability Assessment</p> <p>Drought assessment should be an annual 'habit'.</p> <p>Adopt participatory assessment techniques.</p> <p>Involve local people in data collection.</p> <p>Share assessment results with the community using trusted platforms like traditional leader's meetings.</p>	<p>Planning</p> <p>Adopt community-based drought preparedness and response planning.</p> <p>Ensure micro-level planning is supported and it feeds into national plans.</p> <p>Include private sector, community project members.</p> <p>Establish a planning calendar that allows time to prepare and mitigate drought impact.</p> <p>including all elements that use water and at risks, like livestock, wild animals, institutions, people and vegetation.</p>	<p>Institutional Framework</p> <p>Micro-level institutions like village/ward taskforce/committees need clear terms of reference (ToRs) that covers preparedness.</p> <p>Invest in training and capacity building of the taskforce members.</p> <p>Members of taskforce should be apolitical and trusted include (religious leaders, traditional leaders, community project leaders, vulnerable groups and technical members from all government and NGOs in the area.</p>
<p>Information System</p> <p>The information system should be accessible by all members.</p> <p>Establish a coordinated information system that is trusted by the community.</p>	<p>Resource Base</p> <p>Establish local village level food conservation/banking schemes.</p> <p>Involve private sector players in resource mobilisation.</p> <p>Increase investment in drought preparedness</p>	<p>Warning System</p> <p>Develop a clear communication strategy on drought early warning.</p> <p>Integrate traditional early warning systems.</p>
<p>Response Mechanism</p> <p>Develop proactive response strategies for preparedness.</p> <p>Develop response mechanisms that will reduce dependence.</p>	<p>Public Education</p> <p>Multi-sectoral and multi-dimensional public education and awareness approach.</p>	

Source: Compiled by Author (2021)

6.5 Suggestion for future research

This research only focused on one ward of Lupane District. It is important also to focus on the wider district or even province to broadly understand the issue of drought preparedness on a larger scale. This is important as drought preparedness planning by government, and NGOs focuses on the district and province rather than ward level. It is important to carry out a study on what strategies can be implemented by drought-prone areas as drought progresses from meteorological to socio-economic. Drought preparedness mainly focuses on agricultural drought and this has entrenched the view that drought is only an agricultural problem.

6.6 Concluding remarks

The purpose of this research was to find out the effectiveness of drought preparedness interventions in Daluka ward. A case study format was adopted to have an in-depth analysis of the interventions based on the elements of the disaster preparedness framework. The results of this research show that there is generally a lack of drought preparedness in Daluka ward and this affects effective drought response interventions. Interventions have loopholes that need to be sorted out and authorities to consider some recommendations made above. The challenges faced by the people of Daluka need bottom-up approaches, participation of all the stakeholders including affected the community. It also calls for capacity building of the local community, mainstreaming of drought preparedness in all community, government and NGO activities and adoption of a preparedness sensitive culture. It is fair to say that drought is an insidious hazard with its effects pervasive and geometric on the affected community. It is always challenging to prepare for drought as it progresses and difficult to determine its impact until the end. It is however critical to employ strategies and interventions that will reduce the impact of drought because the cost of not preparing is far more than the costs of preparing for drought response.

References

- Andear, C. 2009. *Zimbabwe- Coping with drought and climate change*. [Online]. Retrieved from: <http://www.adaptationlearning.net> [2020, January 28]
- Alley, W.M., 1984. *The Palmer Drought Severity Index: limitations and assumptions*. Journal of Climate and Applied Meteorology, 23: 1100–1109.
- Alston, M, Kent, J. 2004. *The social impacts of drought: a report to the NSW Department of Agriculture and NSW Premier's Department*, Centre for Rural Social Research. Wagga Wagga, Australia
- Babbie, E. 2001. *The practice of Social Research, 9th Edition*. Belmont: Wadsworth
- Babbie, E. and Mouton, J. 2004. *The Practice of Social Research*. Cape Town: Oxford University Press
- Balamir, M. 2002. *Painful steps of progress from crisis planning to contingency planning: Changes for disaster preparedness in Turkey*. Journal of Contingencies and Crisis Management, 10(1), 39–49. [Online] Retrieved from <https://doi.org/10.1111/1468-5973.00179> [2020, March,21]
- Baird, M. E. 2010. *'The Phases of emergency management*, background paper prepared for the Intermodal Freight Transportation Institute (ITFI). Memphis: University of Memphis
- Bang, S.K. & Sitango, K. 2003. *Indigenous Drought Coping Strategies and Risk Management against EL Nino in Papua New Guinea*: CGPRT centre working paper No. 74.
- Benson, C and Clay, E.J. 2004. *Understanding the Economic and Financial Impacts of Natural Disasters*, Disaster Risk Management Series paper # 4, World Bank, Washington DC
- Beiske, B. 2007. *Research Methods: Uses and limitations of questionnaires, interviews and case studies*, Munich: GRIN Verlag
- Belle, J., Moyo, S., Ogundeji, A.A. 2017. *Assessing communal farmers' preparedness to drought in the Umguza District, Zimbabwe*. *Int. J. Disaster Risk Reduction*. 22, 194–203

Belle, J.A. 2016. *The integration of disaster risk reduction and climate change adaptation strategies into wetlands management in the eastern Free State*, South Africa. PhD. Thesis. University of the Free State: Bloemfontein

Bernard, H.R. 2002. *Research Methods in Anthropology: Qualitative and quantitative methods. 3rd edition*. Alta Mira Press, Walnut Creek, California

Best, J.W. and Kahn, J.V. 2006. *Research in Education* (10th ed) Pearson Education Inc. Cape Town

Borsotti, M. 1993. *Drought Relief Programmes in Zimbabwe. Critical Considerations on its implementation*. [Online]. Retrieved [https://www.researchgate.net/publication/247641348 Zimbabwe's_Drought_Relief_Programme_in_the_1990s_A_ReAssessment_Using_Nationwide_Household_Survey_Data](https://www.researchgate.net/publication/247641348_Zimbabwe's_Drought_Relief_Programme_in_the_1990s_A_ReAssessment_Using_Nationwide_Household_Survey_Data). [2020, August 12]

Bouwman, H., Reuver, M., and Verkasalo, H., 2013. *Opportunities and problems with automated data collection via smartphones*. *Mobile Media and Communication* 1 (1) 63-68

Bowling, A. 2002. *Research Methods in health. Investigating health and health services*. 2nd Edition, Open University Press.

Brüntru, M. and Tsegai, D. 2017 '*Drought Adaptation and Resilience in Developing Countries, in Promoting food security in rural sub-Saharan Africa*'. German Development Institute / Deutsches Institut für Entwicklungspolitik (DIE) funded by the German Ministry for Economic Cooperation and Development (BMZ)

Bruseberg, A, and McDonagh, D., 2003. "*Organizing and Conducting a Focus Group*." In Langford J. and McDonagh D., eds. *Focus Group: Supporting Effective Product Development*. St. Louis: CRC Press, 21–45

Brown, D., Rance Chanakira, R., Chatiza, K., Dhliwayo, M., Dodman, D., Masiwa, M., Zvigadza, S. 2012. *Climate change impacts, vulnerability and adaptation in Zimbabwe*. IIED Climate Change Working Paper No. 3

Bryman, A. 2012. *Social research methods* (5th ed.). Oxford: Oxford University Press

Bryman, A., & Bell, E. 2011. *Business research methods*. 3rd ed. Cambridge; New York, NY: Oxford University Press

Bullock, A.J, Haddow, G. D, Coppola, D., 2013. *Introduction to Emergency Management*. Butterworth Heinemann

Burke, J and Kent, R, 2014. *Preparedness in Action in Present and Future Contexts: Lessons Learned and to be learned*

CADRI (Capacity for Disaster Reduction Initiative). 2017. *Capacity Assessment of the Disaster Risk Management System in Zimbabwe*. Harare. [Online] Retrieved at <https://www.cadri.net/sites/default/files/Zimbabwe-Report-May-2017.pdf>. [2020, July 20]

Cavana, R., Delahaye, B., & Sekaran, U. 2001. *Applied Business Research: Qualitative and Quantitative Methods* (3rd ed.). Australia: John Wiley & Sons

Changnon, S.A. 2003. Measures of economic impacts of weather extremes: Getting better but far from what is needed – a call for action. *Bulletin of the American Meteorological Society*, 84(9): 1231–1235

Chatiza, K. 2019. *Analysis of policy implication for post-disaster institutional development to strengthen disaster risk management*. Cyclone IDAI in Zimbabwe. OXFAM. Harare

Chatora, G. 2007. *An Analysis of Contingency Planning Systems for Disaster Management Authorities in Southern Africa*. Masters. University of Free State, South Africa

Chikodzi, D., Simba, F. M. and Murwendo, T., 2013. Climate Change and Variability in Southeast Zimbabwe: Scenario and societal opportunity. *American Journal of Climate Change*, 2013, 2, 36-46

Chigodora, J 1997; *Famine and drought: The question of food security in Zimbabwe*. *Drought Network News* (1994-2001) 40: 1–7.

Chikoto and Sadiq, 2013. *Disaster Mitigation and Preparedness: Comparison of Non-profit, Public, and Private Organizations*. *Non-profits and Voluntary Sector Quarterly*, 42(2), 391–410

Cohen, A. A., & Lemish, D. 2003. Real-time and recall measures of mobile phone use: Some methodological concerns and empirical applications. *New Media and Society*, 5(2), 167–184

Cohen, L., Manion, L., Morrison, K., 2013. *Research methods in education* (7th ed.). Abingdon, Oxon; New York: Routledge. DOI:10.4324/9780203720967

Cooper, D.R. And Schindler, P.S. 2003. *Business Research Methods*. 8th Edition, McGraw-Hill Irwin, Boston

Corbin, J. & Strauss, A. 2008. *Basics of qualitative research*. Technique and procedures for developing grounded theory. 3rd ed. Sage Publication. Inc

CRED, 2015. *The Human Cost of Natural Disasters: A Global Perspective 2015.*, s.l.: s.n.

CRED, 2020. *Disaster Year Review 2020*. Issue number 58 [Online] Retrieved from: <https://www.preventionweb.net/publications/view/71642> [2020, July 19]

Creswell, J. 2003. *Research design: Qualitative, quantitative and mixed methods approach* (2nd ed.). Thousand Oaks, CA: SAGE Publications

Crossman, N.D., 2018. *Drought Resilience, Adaptation, and Management Policy (DRAMP) Framework*

Dai, A., 2011. *Drought under global warming: a review*. Wiley Interdisciplinary Reviews: Climate Change, 2(1), pp.45-65

Dai, A., 2013. *Increasing drought under global warming in observations and models*. Nature Climate Change, 3(1), 52

Department of Civil Protection, 2012. *Zimbabwe national Contingency plan 2012–2013*, Harare

Denney A, S, & Tewksbury, R. 2012, *How to Write a Literature Review*. Review, Journal of Criminal Justice Education [Online] Retrieved from <https://www.researchgate.net/publication/263041369> *How to Write a Literature Review* [2020, April, 5].

De Vos, A. S. 2001. *Research at Grass Roots: A primer for the caring professions*. Pretoria: Van Schaik

Dordick, H., & La Rose, B. 1992. *The telephone in daily life: A study of personal telephone use*. Unpublished manuscript. Temple University

Dube, C., 2008. *The Impact of Zimbabwe's Drought Policy on Sontala Rural Community in Matebeleland South Province.*, s.l.: Department of Geology, Stellenbosch University

Drost, E. A. 2011. *Validity and Reliability in social science research*. Education Research Perspective. 38. 105-123

Edwards, D.C. and McKee, T.B. 1997. *Characteristics of 20th Century Drought in the United States at Multiple Time Scales*. Climatology Report 97-2, Department of Atmospheric Science, Colorado State University, Fort Collins

Eriksson, K. 2010. *Preparing for preparedness—Shaping crisis planning processes in local authorities*. Ph.D. dissertation. Department of Fire Safety Engineering and Systems Safety, Lund University, Lund

FAO (2016) *The State of Food and Agriculture, 2016: Food Aid for Food Security?*, Food and Agriculture Organisation of the United Nations

FAO, 1996. *Rainfall variability and drought in Sub-Saharan Africa*, Environment and Natural Resources Service (SDRN) FAO Research, Extension, and Training Division

FAO, 2004. *Mitigation and prevention of drought in the Limpopo River basin*. A situational analysis. Land and Water discussion paper 4. Rome

Field, A. P. 2005. *Discovering Statistics Using SPSS*, Sage Publications Inc.

Flick, U. 2011. *Introducing research methodology: A beginner's guide to doing a research project*. London: Sage

Fraenkel, R. J., & Wallen, E. N. 2000. *How to design and evaluate research in education* (4th ed.). San Francisco McGraw-Hill

Gaha-Sapir, D., Hoyois, P., Below, R., Vanderveken, A., 2016. *Annual Disaster Statistical Review 2015. The numbers and trends*, Centre for Research on the Epidemiology of Disasters (CRED)

Gornall, J., Betts, R., Burke, E., Clark, R., Camp, J., Willet, K., Wiltshire, A., 2010. *Implications of climate change for agricultural productivity in the early twenty-first century*. The Royal Society Publication [Online] Retrieved at <https://doi.org/10.1098/rstb.2010.0158> [2020, June 5]

Ghuri, P. & Gronhaug, K. 2005. *Research Methods in Business Studies*, Harlow, FT/Prentice Hall

Giller, K. E, Andersson, J.A, Corbeels, M, Kirkegaard, Mortensen, D., Erenstein, O, Vanlauwe, B., 2015. *Beyond conservation agriculture*, Frontiers in Plant Science. US National Library of Medicine National Institute of Health

Glantz, M. H. 1987, *Drought and Hunger in Africa: Denying Famine a Future*, Cambridge University Press, Cambridge

Goddard, W., & Melville, S. 2004. *Research Methodology: An Introduction*. Juta Academic

Government of Zimbabwe, 1989. *Civil Protection Act Chapter 10:06*. Government of Zimbabwe, Zimbabwe

Government of Zimbabwe, 2013. *National Contingency Plan*. Harare, Zimbabwe

Government of Zimbabwe, 2019. *National Drought Risk Capacity Operational Plan for Early Response*. Harare, Zimbabwe

Graef F. and Haigis J., 2001. *Spatial and temporal rainfall variability in the Sahel and its effects on farmers' management strategies*. Journal of Arid Environments, 48:221–231

Grant, C, and Onslow, A., 2014. Understanding selecting and integrating a theoretical framework in dissertation research, developing a blueprint for your house. [Online] Retrieved at <https://www.researchgate.net/publication/266015734>. [2020 June 20]

Grinnell, R.M. & Williams, M. 1990. *Research in social work: a primer*. Itasca: F.E. Peacock Publishers

Gwimbi, P. 2007. *The effectiveness of early warning systems for the reduction of flood disasters: Some experiences from cyclone-induced floods in Zimbabwe*. Journal of Sustainable Development in Africa, Volume 9(4):152-169. Fayetteville State University, North Carolina, USA. [Online]. Retrieved from: http://www.jsdafrica.com/Jsda/V9n4_Winter2007/PDF/EfectivenessEalierWarningSystem.pdf [2021, March 12]

Hannes K, Lockwood C, 2011, *Synthesizing Qualitative Research*. Chichester: John Wiley & Sons, Ltd;

Hagman, G. 1984. *Prevention before Cure: Report on Human and Natural Disasters in the Third World*, Swedish Red Cross, Stockholm

- Haile, M., 2005. *Weather patterns, food security and humanitarian response in sub-Saharan Africa*. Philosophical Transactions of the Royal Society B, 360(1463): 2169–2182
- Hammersley, M. 1992, *What is Wrong with Ethnography: Methodological Explanations*, London: Routledge
- Hayes, M. J. and Svoboda, M. 2005. *Drought Monitoring: New Tools for the 21st Century*.
- Hayes, M., M. Svoboda, N. Wall and M. Widhalm, 2011: *The Lincoln Declaration on Drought Indices: Universal Meteorological Drought Index Recommended*. Bulletin of the American Meteorological Society, 92(4): 485–488
- Hayes, M. J., M. Svoboda, D. Le Comte, K. T. Redmond, and P. and Pasteris, 2005: *Drought Monitoring: New Tools for the 21st Century*. *Drought and Water Crises: Science, Technology, and Management Issues*, D. A. Wilhite ed., CRC Press, Taylor & Francis Group, 53-69
- Hayward, C., Simpson, L., & Wood, L. 2004. *Still left out in the cold: Problematizing participatory research and development*. Sociologic Rural, 44, 95– 108
- Hemond, Y., & Robert, B. 2012. *Preparedness: The state of the art and prospects*. *Disaster Prevention and Management: An International Journal*, 21(4), 404–417
- Henning, E., Van Rensburg, W. and Smit, B., 2004. *Finding your way in qualitative research*. Van Schaick Publishers, Pretoria
- Hulme, M., Doherty, R., Ngara, T., New, M., Lister, D., David 2016, *African climate change: 1900–2100*. Tyndall Centre for Climate Change Research and 2 Climatic Research Unit, School of Environmental Sciences, University of East Anglia, Norwich NR4 7TJ, United Kingdom
- Hobson, S.D., 1994, '*Vulnerability, Food Security and appropriate interventions*', MSc thesis, Dept. of Agricultural Economics, University of Pretoria, South Africa
- Inspire Consortium, 2015. *Evidence-Based Decision Making for Funding Allocations*. [Online] Retrieved at <http://reliefweb.int/report/world/evidence-based-decision-making-funding-allocations> [2020, August 24]

Inter-Agency Standing Committee (IASC), 2011. *Preparedness saves time, money and lives*. [Online]. Retrieved from. https://www.who.int/hac/network/interagency/news/iasc_preparedness_saves_time_money_lives.pdf. [2020, July 23]

IPCC, 2012. *Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX)*. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change, edited by C. B. Field, V. Barros, T. F. Stocker, and Q. Dahe, Cambridge University Press: Cambridge, UK.

IPCC, 2014: Annex II: Glossary [Mach, K.J., S. Planton, and C. von Stechow (eds.)]. In: *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II, and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, R.K. Pachauri, and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, pp. 117-130.

Jiri, O.; Mtali-Chafadza, L.; Mafongoya, P.L. 2017, Influence of smallholder farmers' perceptions on adaptation strategies to climate change and policy implications in Zimbabwe. *Chang. Adapt. Socio Ecol. Syst.*

Johnson RB, Onwuegbuzie AJ, Turner LA. Toward a Definition of Mixed Methods Research. *Journal of Mixed Methods Research*. 2007;1(2):112-133. doi:[10.1177/1558689806298224](https://doi.org/10.1177/1558689806298224)

Kent, R. 1992. *Disaster Preparedness*. 1st Edition. UNDMTP

Kent, R., 1994, *Disaster Management Training Module*, UNDP, DHA. University of Wisconsin Disaster Management Center

King-Okumu, C.; Jillo, B.; Kinyanjui, J.; Jarso, I. 2017. *Devolving water governance in the Kenyan Arid Lands: from top-down drought and flood emergency response to locally-driven water resource development planning*. *International Journal of Water Resources Development*

Kirschenbaum, A. 2002. *Disaster preparedness: A conceptual and empirical re-evaluation*. *International Journal of Mass Emergencies and Disaster* 20(1), 5-18

Kothari, C. R. 2004. *Research methodology: methods and techniques*. New Delhi: New Age International

Krueger, R. A. & Casey. M. A., 2000. *Focus Groups. A Practical Guide for Applied Research* (3rd Edition). Thousand Oaks, CA: Sage Publications

Lawrence Neuman, W. 2003, *Research Methods: Qualitative and Quantitative Approaches* (5th ed.), New York: Pearson Education, Inc

Leedy, P. & Ormrod O. 2013. *Practical research: planning and design*. 10th edition. New York: Pearson

Leedy, P.D. and Ormrod, J.E. 2005. *Practical Research: Planning and Design*. Prentice Hall, Upper Saddle River, NJ.

Leedy, P.D. & Ormrod, J.E. 2001. *Practical Research Planning and Design*, Seventh Edition. New Jersey: Prentice-Hall

Lewis, J. L., & Sheppard, S. R. J. 2006. *Culture and Communication: Can Landscape Visualization Improve Forest Management Consultation with Indigenous Communities?* *Landscape and Urban Planning*, 77, 291-313

Makungurutse, C, S, Nyapwere, N, Manyanga A, M, Mhaka L. 2018 *Pedological Characterization and Classification of Typical Soils of Lupane District, Zimbabwe*, *International Journal of Plant & Soil Science* 22(3): 1-12, 2018; Article no.IJPSS.39609 ISSN: 2320-7035

Maree, K. 2007. *First steps in research*. Pretoria: Van Schaik

Mavhura, E. 2016. *Disaster legislation: a critical review of the Civil Protection Act of Zimbabwe*, *Natural Hazards*. Springer Netherlands, 80(1), pp. 605–621.

Mays, R. E., Walton, R., & Savino, B. 2013. *Emerging trends toward holistic disaster preparedness*. In T. Comes, F. Fiedrich, S. Fortier, J. Geldermann, & T. Meuller (Eds.), 10th international ISCRAM Conference Baden-Baden, Germany (pp. 764–769). Karlsruhe: KIT.

Mesly, O. 2015. *Creating models in psychological research*. Etats-Unis: Springer press

Michler, J.D., Baylis, K., Arends-Kuenning, M., Mazvimavi, K. 2019. *Conservation agriculture and climate resilience*. *J. Environ. Econ. Manag.* 2019, 93, 148–169

Miles, M. B., & Huberman, A. M. 1994. *Qualitative data analysis: An expanded sourcebook*. (2nd ed.). Thousand Oaks, CA: Sage Publications

Mishra A.K, Singh V.P. 2010. *A review of drought concepts*. *J Hydrol.* [Online]. Retrieved from: <https://www.sciencedirect.com/science/article/pii/S0022169410004257>. [2020, July 18]

Mouton, J., and Marais, H.C. 1990. *Basic Concepts in the methodology of social science*. HSRC Publishers, Pretoria

Maliva, R. G. and Missimer, T. M. 2012, *Arid Land Water Evaluation and Management*, Springer, Berlin.

Mpofu, S. 2014. *WFP struggles to avert starvation in Zimbabwe*. [Online]. Retrieved from: <http://reliefweb.int/report/zimbabwe/wfp-struggles-avert-starvation-zimbabwe> [2020, March 8]

Mudimu, G. 2003. *Zimbabwe Food Security Issue Paper*. Overseas Development Institute. England, Wales

Mushore, T. D. 2013. *Climatic Changes, Erratic Rains and the Necessity of Constructing Water Infrastructure: Post 2000 Land Reform in Zimbabwe*. International Journal of Scientific & Technology Research 2(8)

Mutowo, G. and Chikodzi, D. 2014 *Remote sensing-based drought monitoring in Zimbabwe* [Online] Retrieved at <http://doi: 10.1108/DPM-10-2013-0181>

Nangombe, S.S. 2014. Drought conditions and management strategies in Zimbabwe. [Online] Retrieved at <http://www.droughtmanagement.info/literature/>. [2020, July 28]

Nangombe, S.S., 2015. *Drought conditions and management strategies in Zimbabwe*. In Proceedings of the Regional Workshops on Capacity Development to Support National Drought Management Policies for Eastern and Southern Africa and the Near East and North Africa Regions

Ncube, B; Twomlow, S, J; Dimes, J, P; Van Wijk, M, T; Giller, K, E. 2009. Resource flows, crops and soil fertility management in smallholder farming systems in semi-arid Zimbabwe

Ndlovu, E. 2011. *An investigation into the impact of prolonged food aid programme on the vulnerable population on vulnerable population in Zimbabwe*. A case study of food aid programming in ward 9 and 10 on Matobo District in Southwestern Zimbabwe. University of Free State, South Africa.

Neuman, W.L. 2003. *Social Research Methods Qualitative and Quantitative Approaches*. Allyn and Bacon, New York

Neuman, W.L. 2003, *Social Research Methods: Qualitative and Quantitative Approaches* (5th ed.). Boston: Allyn and Bacon

- Nyakudya, I., Stroosnijder, L., 2011. *Water management options based on rainfall analysis for rainfed maize production in Rushinga District, Zimbabwe*. *Agric Water Management* 98(10): 1649–1659.
- OCHA, UNCT Zimbabwe, 2020; Zimbabwe Humanitarian Response Plan, Harare, Zimbabwe
- Patton, M. 2002. *Qualitative Research and Evaluation Methods*, 3rd edn. Thousand Oaks, CA
- Perry, R. W and Lindell, M. K., 2004. *Preparedness for Emergency Response: Guidelines for the Emergency Planning Process*. *Disasters* 27(4):336-50
- Poulton, C., Davies, R., Matshe, I. and Urey, I. 2002. *A review of Zimbabwe's agricultural economic policies 1980-2000*. ADU working paper. Imperial college Wye, Wye. [Online]. Retrieved at: <http://ageconsearch.umn.edu/bitstream/10922/1/adwp0201.pdf> [2020, May 09]
- Punch, K, F. 2005. *Introduction to Social Research–Quantitative & Qualitative Approaches*. London: Sage
- Raithatha, Y. 2017. *Understanding the economic impact terrorism has on destination decision making: Northern Irish tourists*. Doctoral dissertation. Dublin Business School
- Randela, R., 2005, '*Integration of emerging cotton farmers into the commercial agricultural economy*', PhD thesis, Dept. of Agricultural Economics, University of Free State, Bloemfontein, South Africa
- Rathore, M.S. 2005. *State Level Analysis of Drought Policies and Impacts in Rajasthan, India*, IWMI Working Papers H037842, International Water Management Institute.
- Ramamasy, S. & Baas, S., 2007. *Climate Variability and Change: Adaptation to Drought in Bangladesh*, A resource book and Training Guide, Rome: FAO
- Reed, S. B. 1997. *Introduction to hazards*. 3rd edition. UNDMTP.
- SADC (Southern African Development Community) (2016) Regional Strategic Action Plan on Integrated Water Resources Development and Management Phase IV. SADC, Gaborone
- SADC (Southern African Development Community) (2016) SADC Regional Humanitarian Appeal, June 2016. Secretariat S, Gaborone, Botswana
- Saunders, M., Lewis, P., & Thornhill, A. 2003. *Research Methods for Business Students*, (3rd edition.) London: Pearson

Saunders, M., Lewis, P., & Thornhill, A. 2007. *Research Methods for Business Students*, (6th ed.) London: Pearson.

Scoones, I. 1992. *Coping with Drought: Responses of herders and livestock in contrasting savanna environments in Southern Zimbabwe*. *Human ecology* 20, 3: 293-315

Silverman, D. 2013. *Doing Qualitative Research: A practical handbook*. London: Sage Publishers

Sivakumar, M.V.K, Wilhite, D.A, Svoboda, M.D, Hayes, M., Motha, R., 2011. *Drought Risk and Meteorological droughts*. Global Assessment Report on Disaster Risk Reduction (GAR) , ISDR.

Simpson, D. M. (2008). *Disaster preparedness measures: A test case development and application*. *Disaster Prevention and Management: An International Journal*, 17(5), 645–661.

Slik, J.W F. 2004. El Niño droughts and their effects on tree species composition and diversity in tropical rain forests. *Oecologia*, [Online] Retrieved at <https://doi.org/10.1007/s00442-004-1635-y> [2020 October 15]

Staupe-Delgado, R., Kruke, B, I., 2017. *Preparedness: Unpacking and clarifying the concept*: *Journal of Contingencies and Crisis Management* 26 (4).

Stringer L, Dyer J, Reed, M, Dougill J, Twyman C, Mkwambisi D. 2009. *Adaptations to climate change, drought, and desertification: local insights to enhance policy in southern Africa*. *Environ SciPolicy* 12(7): 748–765.

Sutton, J., and Tierney, K. 2006. *Disaster Preparedness: Concepts, Guidance, and Research* Assessing Disaster Preparedness Conference Sebastopol, California, [Online] Retrieved at <http://www.fritzinstitute.org/pdfs/whitepaper/disasterpreparednessconcepts.pdf> [2020, July 28]

Swanson, R. A., & Chermack, T. J. 2013. *Theory building in applied disciplines*. San Francisco, CA: Berrett-Koehler Publishers

Tadesse, T. 2016. *Strategic Framework for Drought Risk Management and Enhancing Resilience in Africa*. African Drought Conference 2016, Windhoek, Namibia

Tadele, F., & Manyena, S. B. 2009. *Building disaster resilience through capacity building in Ethiopia*. *Disaster Prevention and Management: An International Journal*, 18(3), 317–326. [Online] Retrieved from <https://doi.org/10.1108/09653560910965664> [2020, July, 20]

Thompson, C. 1993. *Drought Management Strategies in Southern Africa: From Relief through rehabilitation to vulnerability reduction*. Windhoek: UNICEF

Thriemer K, Ley B, Ame SM, Puri MK, Hashim R, Chang NY. 2012. *Replacing paper data collection forms with electronic data entry in the field: findings from a study of community-acquired bloodstream infections in Pemba, Zanzibar*.

Toulmin, C. 2009. *Climate change in Africa*. ZED Books, London and New York, 172 p.

Trenberth, K.E., 2010. *Changes in precipitation with climate change*. *Climate Research*, 47, 123–138

UN, 2015. *The Sendai Framework for Disaster Risk Reduction 2015-2030*. [Online] Retrieved at <http://www.unisdr.org/we/coordinate/sendai-framework> [2020, August 23]

UN/ISDR, 2008. *Disaster Preparedness for Effective Response Guidance and Indicator Package for Implementing Priority Five of the Hyogo Framework*. UN/ISDR and UN/OCHA, Geneva, Switzerland

UNDP/BCPR., 2013. *Issue Brief: Disaster Preparedness -UNDP in Action*, UN, New York

UNISDR & UNOCHA, 2008. *Disaster Preparedness for Effective Response Guidance and Indicator Package for Implementing Priority Five of the Hyogo Framework*. [Online] Retrieved at http://www.unisdr.org/files/2909_Disasterpreparednessforeffectiveresponse.pdf [2020, August 23]

UNISDR, 2004. *Terminology: Basic terms of disaster risk reduction*. The UNISDR Secretariat. [Online] Retrieved http://www.unisdr.org/files/7817_7819isdrterminology11.pdf [2020, August,14]

UNISDR, 2008. *Disaster preparedness for effective response: Guidance and indicator package for implementing priority five of the Hyogo framework*. Geneva: United Nations Office for Disaster Risk Reduction

UNISDR, 2015. *Sendai Framework for disaster risk reduction 2015-2030*. Third UN World Conference in Sendai Japan

United Nations, 2005. *International Cooperation on Humanitarian Assistance in the Field of Natural Disasters, from Relief to Development A/RES/59/212*. General Assembly Resolution 59/212 available from undocs.org/A/RES/59/212

UNFCCC, 2007. IPCC Fourth Assessment Report (AR4), 2007. Glossary of key terms. [Online] Retrieved from <https://www4.unfccc.int/sites/NAPC/Pages/glossary.aspx> [2020 October, 10]

UNSO, 1999, *Drought Preparedness and Mitigation in Sub-Saharan Africa*, United Nations Office to Combat Desertification and Drought, New York

USAID, 2020; Food Assistance Fact Sheet, Zimbabwe [Online] Retrieved <https://www.usaid.gov/zimbabwe/food-assistance> [2020, August, 20]

Van Zyl, K., 2006, *A study on a Disaster Risk Management Plan for the South African Agricultural Sector*, South Africa

Vincent, V., and R.G. Thomas, 1961. *An Agricultural Survey of Southern Rhodesia, Part One – Agro-29 ecological Survey*, The Government Printers, Salisbury

Waugh, W. L. 2000. *Living with Hazards, Dealing with Disasters. An introduction to Emergency Management*. Armok, New York. M.E. Sharpe

Welman, C. Kruger, F. And Mitchell, B. 2005. *Research Methodology, 3rd edition*. Cape Town: Oxford University Press

WFP, 2016. *Lupane District Profile*, VAM, WFP, Harare

Wilhelmi, O.V, and Wilhite, D.A. 2000. Natural Hazards. [Online] Retrieved at <http://doi.org/10.1023/A:1013388814894>

Wilhite, D.A. and Glantz, M. H.,1985. *Understanding the Drought Phenomenon: The Role of Definitions*. Drought Mitigation Center Faculty Publications. 20.

Wilhite D.A., Hayes M.J. and Knutson C.L. 2005. *Drought preparedness planning: Building institutional capacity*. In: *Drought and Water Crises: Science, technology, and management issues* (Wilhite, D.A. Ed.). CRC Press, Taylor and Francis Group, Boca Raton, London, New York

Wilhite, D.A., Sivakumar, M.V.K, Wood, D., 2000, *Improving Drought Early Warning Systems in the Context of Drought Preparedness & Mitigation*, University of Nebraska, Lincoln

Wilhite, D. A and Svoboda, M. D. 2000. *Drought early warning systems in the context of drought preparedness and mitigation*. In Wilhite, D.A, Sivakumar M.K.V and Wood, D.A (Eds) EWS for drought preparedness and drought management. Proceedings of an expert group meeting in Lisbon, Portugal. 5-7 September. Geneva, Switzerland

Wilhite, D. A. 1991, "Drought Planning: A Process for State Government," Water Resources Bulletin, Volume 27, Number 1, pp. 29–38

Wilhite, D. A. 1999, *Preparing for Drought: A Methodology*, in Wilhite, D. A. (Ed.), *Drought: A Global Assessment*, Routledge Publishers, London, Volume 2, pp. 89–104

Wilhite, D. A., 2000. *Drought a Natural Hazard*. Concepts and Definitions. Chapter 1. Lincoln: National Drought Mitigation Centre

Wilhite, D. A., and Easterling, W. E. 1987, *Introduction (workshop summary)*, Chapter 34, in D. A. Wilhite and W. E. Easterling (eds.), *Planning for Drought: Toward a Reduction of Societal Vulnerability*, Westview Press, Boulder, Colorado, U.S.A

Wilhite, D.A, 2000. *Drought: A Global Assessment, Natural Hazards and Disaster Series*. London: Routledge Publishers

Wilhite, D.A. 2000. *Drought Preparedness and Response in the Context of Sub-Saharan Africa*. Drought Mitigation Centre. Faculty Publication. 34. The University of Nebraska-Lincoln

Williman, N. 2011. *Research Methods*. The Basics. New York Routledge

World Bank, 2019. *Zimbabwe Agriculture Sector Disaster Risk Assessment*. Building Disaster Resilience in Sub-Saharan Africa.

Yin, R. K. 2009. *Case study research: Design and methods* (4th Ed.). Thousand Oaks, CA: Sage

Zeng, N. 2003, *Glacial-interglacial atmospheric CO₂ changes–The glacial burial hypothesis*, *Adv. Atmos. Sci.*, **20**, 677– 693.

Zimbabwe National Water Authority (ZINWA), 2015; Environment and social management plan for Lupane water supply subproject, Matabeleland North Province, Lupane. Zimbabwe

Zimbabwe Resilience Building Fund (ZRBF) 2019. *Lupane District Ward 19 Resilience Plan*, UNDP

Zimbabwe Statistical Agency (ZimStat). 2012. *Census 2012 Preliminary Report*. Harare. Government of Zimbabwe

ZimVAC, 2012, *Rural Livelihoods Assessment May 2012 Report*, Food and Nutrition Council (FNC), Harare Zimbabwe

ZimVAC, 2015, Rural Livelihoods Assessment May 2015 Report. Food and Nutrition Council (FNC), Harare, Zimbabwe

References

Annexe 1: Household representative questionnaire

University of the Free State

Disaster Management Training and Education Centre for Africa (DiMTEC)

INTRODUCTION

My name is Tobias Ndlovu, a postgraduate student at the Disaster Management Training and Education Centre for Africa (DiMTEC) at the University of the Free State, South Africa. As part of the study programme and requirement for the partial fulfilment of a master's degree in Disaster Management, students are expected to engage in a field of research and produce a mini dissertation covering their chosen research area. I am, therefore, researching ***“an assessment of the effectiveness of drought preparedness in Daluka ward of Lupane district”***. I guarantee that the information gathered in this exercise will be strictly used for academic purposes only, and the respondent's confidentiality will be respected. Having said this, I would like to request your participation in this exercise. You can, of course, decide not to answer any uncomfortable questions or pull out of the interview if you deem it necessary.

Development & Disaster Management Community Project Participants Interviews

Date: Interviewee No:.....

Name of the village

- | | |
|-------------------|----------------------|
| 1. Daluka Village | <input type="text"/> |
| 2. Sivalo | <input type="text"/> |
| 3. Sibangani 1 | <input type="text"/> |
| 4. Sibangani 2 | <input type="text"/> |
| 5. Strip Road | <input type="text"/> |

Socio-Demographics

Q1: How long have you participated in community projects in Daluka? (*Indicate the response number(code) in the box, example 1 or 2 etc*)

- 1 = Less than 1 month 2 = Between 2 to 6 months 3 = 7 to 12 months**
4 = 13 to 24 months 5 = 25 to 60 months 6 = More than 5 years

Q2. What is your highest educational level? (*Indicate the response number (code) in box*)

- 1 = No formal education 2 = Primary 3 = Secondary 4 = Tertiary**

Q3 What is your age group? (*Indicate the code in the box*)

- 1 = 18 to 25 years 2 = 26 to 30 years 3 = 31 to 40 years 4 = 41 to 59 years**
5 = Above 60 years

Q4 What is your gender? (*Indicate the code in the box*) **1 = Male 2 = Female**

Q5 What is your marital status? (*Indicate the code in the box*)

- 1 = Married 2 = Co- habitating 3 = Married but not staying together**
4 = Never married 5 = Widowed 6 = Divorced or separated

Q6 How many are you in your households? (*Indicate the number in the box*)

Hazards

Q7. Rank Hazards in terms of frequency in your Community (*Indicate 1, 2,3 in the box below*)

Hazard	Rank
Floods	

Droughts	
Veld Fire	
Epidemics	
Other	

Q8. How would you describe the impact of the most frequent hazard over the past 5 years?
(Tick where appropriate)

Response	Tick
1 = Largely Decreasing	
2 = Slightly decreasing	
3 = Has been the same	
4 = Slightly increasing	
5 = Largely increasing	
6 = I am not sure	

Q9. How do you rate your community's preparedness for these hazards? (Tick where appropriate)

Response	Tick
1 = Totally Prepared	
2 = Almost prepared	
3 = Less prepared	
4 = Not prepared at all	

Q10. If less prepared or not prepared at all what do you think are the reasons? Tick responses appropriate (multiple responses)

Response	Tick all appropriate
1 = No institutional support	
2 = Lack of policy and guidelines	
3 = Lack of resources	
4 = Lack of information & knowledge	
5 = Lack of political will	
6 = None	
7 = Other _____	

Other comments of disaster preparedness

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Drought Preparedness related assessments

Vulnerability Assessment

Q11. When was the last drought vulnerability assessment carried out by NGOs/Government in your community? (*Indicate the code in the box*) **1 = Within 12 months** **2 = 13 to 24 months** **3 = More than 2 years** **4 = Do not remember**

Q12. Who was involved in drought vulnerability assessments? (*Tick all involved*)

Response	Tick
1 = Government departments	
2 = NGOs & CBOs	
3 = Traditional leaders (village heads)	
4 = Political leaders (councillors)	

5 = Community DRR committees	
7 = Other _____	
8 = None	

Q13. Are the results of the Vulnerability Assessment shared with the community? (*Indicate the code in the box*) **1 = Yes 2 = No 3 = I don't know**

Q14. If results are shared on Q13 how are they shared? (*tick all appropriate*)

Response	Tick
1. Public Community meetings	
2. Feedback to the selected community level committees/ stakeholders	
3. Public media	
4. Social media	
5. Not shared at all	
6. I am not sure	

Training and Capacity Building

Q15. In the past 5 years has your community received any training on how to prepare for droughts? (*Indicate the code in the box*)

1 = Yes 2 = No 3 = I don't know

Q16. If yes on Q15 above who conducted the training on the drought preparedness? (*Indicate the code in the box*) **1 = Government Extension 2 = NGOs 3 = Educational Institutions 4 = Other(Specify) _____**

Q17. If the project participants /community members were trained what kind of information was given?

	Responses	Tick all appropriate
1	Climate Change information	
2	Early warning systems	
3	Drought Response	
4	Drought preparedness planning & strategies	
5	Water/Food Conservation	
6	Drought resistance crops	
7	Conservation farming	
8	Other	

.....

Information & Early warning

Q18. What are the community main sources of drought warning systems?

	Responses	Tick all appropriate
1	Traditional leader meetings	
2	Government Meteorological services	
3	Agricultural Extension services	
4	Public medial Radio, television & newspapers	
5	NGO & CBO awareness activities	
6	Social media platforms	
7	Other _____	

8	None	
---	------	--

Q19: Does the community use traditional early warning to prepare for drought? (*Indicate the code in box 1 or 2 or 3*) **1 = Yes all the times** **2 = Sometimes** **3 = Not at all**

Q20. In your opinion, how reliable are these drought early warnings sources?

	Responses	Very reliable	Sometime reliable	Less reliable	Not reliable at all
1	Traditional Knowledge systems				
2	Met Department forecast				
3	Agritex forecasts & predictions				
4	Religious leader prophecies				
5	Traditional spirit medium				
6	Other _____				

Resources

Q21. What resources are available in your community for drought preparedness? (*Tick where appropriate*)

	Responses	Always available	Sometime available	Less available	Not available at all
1	Community drought funds				
2	Government drought funds				
3	NGO & CBO preparedness funds				

4	Community Food reserves				
5	Government food reserves				
6	Private sector financial/material				
7	Alternative water sources				
8	NGO food/cash assistance				
9	Government free/subsidised food assistance				
10	Other specify _____				

.....

 Q22. Is there drought response or preparedness funds in your community (*Indicate the code in the box*)?

1 = Yes 2 = No 3 = I don't know

Q23. How can you describe your community in terms of drought preparedness and mitigation resources dependency? (*Indicate the code in the box*)?

1 = Entirely depend on government; 2 = Sometimes depend on government; 3 = Entirely depend on NGOs; 4 = Sometimes depend on NGOs; 5 = Entirely independent

Institutional structures

Q24. Is there a drought task force/committee in the community? (*Indicate the code in the box*)?
1 = Yes 2 = No 3 = I don't know

Q25. If there is a drought task force in your community at what level is it established?

	Response	Tick all appropriate
1	Village	

2	Ward level	
3	District level	
4	I am not sure	

Q26. If there is a drought taskforce/committee that participates in the drought committee/taskforce (tick where appropriate)

	Response	Tick all appropriate
1	Traditional leaders	
3	Councillors	
4	Special interest groups e.g. Home-based Care, Disabled people	
5	Private sector	
6	NGOs	
7	Government representatives	
8	Other _____	

Q27. What are the roles of the drought committee/taskforce in your community?

	Responses	Tick all appropriate
1	Carry out the vulnerability assessment	
3	Meet and plan for drought response	
4	Resource mobilisation for drought	
5	Drought awareness activities	
6	Receive food assistance and distribute	

7	Select beneficiaries for food assistance	
8	I don't know	
9	Other _____	

Drought Preparedness Plan

Q.28 Is there a drought preparedness plan before a drought event for your community?
(Indicate the code in the box)?

1 = Yes 2 = No 3 = I don't know

Q29. Is there drought planning during a drought event in your community? *(Indicate the code in the box)?*

1 = Yes 2 = No 3 = I don't know

Q30. If there is a drought preparedness or response plan at what level is this plan established?

	Response	Tick all appropriate
1	Village	
2	Ward level	
3	District level	
4	I am not sure	

Q31: Who participates in developing drought plans in your community?

	Response	Tick all appropriate
1	Ward/Village leaders only	
2	Community leaders & NGOs	

3	Government & NGOs	
4	Government, NGOs & Community leaders	
5	Everyone in the community	
6	None	

Strategies

Q32. If a drought year is predicted what actions do you take as a community to prepare?
(Tick where appropriate)

	Responses	Always	Sometime	Not at all	Not available at all
1	Employ water-saving strategies				
2	Stockpile food				
3	Improve water availability by sinking boreholes or deepening wells				
4	Send livestock to alternative water points to save water				
5	Community meetings and strategies to mitigate droughts impacts				
6	Request for further information on drought for community planning				
7	Plant drought-resistant crops				
8	Carry out further drought risk				

	assessments.				
9	Appeal for food/cash assistance				
10	Other Specify_____				

.....
.....
.....
.....

33: Any other comments:.....

.....
.....

End

Annexe 2: Key Informant Interview questions

INTRODUCTION

My name is Tobias Ndlovu, a postgraduate student at the Disaster Management Training and Education Centre for Africa (DiMTEC) at the University of the Free State, South Africa. As part of the study programme and requirement for the partial fulfilment of a master's degree in Disaster Management, students are expected to engage in a field of research and produce a mini dissertation covering their chosen research area. I am, therefore, researching "***an assessment of the effectiveness of drought preparedness in Daluka ward of Lupane district***". I guarantee that the information gathered in this exercise will be strictly used for academic purposes only, and the respondent's confidentiality will be respected. Having said this, I would like to request your participation in answering these questions. You can, of course, decide not to answer any uncomfortable questions.

Questionnaire for GVT/NGO/CBO Representatives (Phone Calls)

Q1: What is your role in your organisation?

Q2: What is your organisation doing in the Daluka ward and how long have you been doing these activities?

Q3: In terms of drought what achievements have you made or have you witnessed in the Daluka ward?

Q4: In all your organisation or what you have witnessed in Daluka how was the community involved?

Q5: In terms of Vulnerability Assessment for drought, what have been done in Daluka and your assessment of what can be improved?

Q6: In terms of Drought planning what has your organisation or your self done in Daluka ward what were your experiences?

Q7: Do you think the institutions and policies support drought preparedness in a community like Daluka

Q8: In terms of information system, drought early warning and awareness of what has been happening in Daluka what are your opinions?

Q9: In terms of resources need for preparedness and response what do you think is the situation and what can be done?

Q10: In your, you view what is done properly or wrong in Daluka in terms of drought preparedness and what are your conclusions and recommendations

Thank you

END

Annexe 3: Focus Group Discussion guide

Q1: Tell us your experience in drought management in your community?

Q2: What is going right and what is going wrong in drought management and preparedness in your community?

Q3: Who do you think to have a role in drought risk management, do you think you as a community have a role?

Q4: How are you as a community and organisations doing to manage drought in your community do you think it is sufficient.

Q5: What support do you think is needed by your community to deal with drought effectivity.

End

Annexe 4: Ethical Clearance



GENERAL/HUMAN RESEARCH ETHICS COMMITTEE (GHREC)

27-Jan-2021

Dear Mr Tobias Ndlovu

Application Approved

Research Project Title:

**AN ANALYSIS OF DROUGHT PREPAREDNESS INTERVENTIONS IN DALUKA WARD,
LUPANE DISTRICT, MATABELELAND NORTH, ZIMBABWE**

Ethical Clearance number:

UFS-HSD2020/1881/251

We are pleased to inform you that your application for ethical clearance has been approved. Your ethical clearance is valid for twelve (12) months from the date of issue. We request that any changes that may take place during the course of your study/research project be submitted to the ethics office to ensure ethical transparency. Furthermore, you are requested to submit the final report of your study/research project to the ethics office. Should you require more time to complete this research, please apply for an extension. Thank you for submitting your proposal for ethical clearance; we wish you the best of luck and success with your research.

Please ensure that you comply with all government and UFS protocols related to COVID-19 when conducting research

Yours sincerely

Dr Adri Du Plessis

Chairperson: General/Human Research Ethics Committee

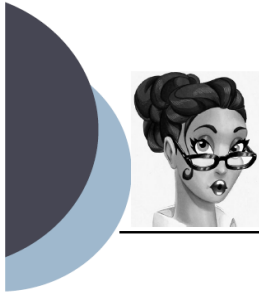
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Annexe 5: Letter of Confirmation



D.K.M

LANGUAGE AND TECHNICAL EDITING ♦ PROOFREADING ♦ PLAGARISM CHECKING ♦ ACADEMIC RESEARCH
(HONS AND MASTERS) AND PROJECT SUPERVISION ♦ BUSINESS PROPOSAL

30 April 2021

LETTER OF CONFIRMATION

I hereby confirm that I have done the language editing for the following dissertation:

Author: Mr T Ndlovu

Title: AN ANALYSIS OF DROUGHT PREPAREDNESS INTERVENTIONS IN DALUKA WARD, LUPANE DISTRICT,
MATABELELAND NORTH, ZIMBABWE.

Document: Master of Disaster Management

I have edited Mr T Ndlovu document and made appropriate changes and highlighted areas that the student needs to revisit. The document was edited using track changes and comments in Microsoft word.

I am not responsible for any additional information that is added to the document after I have edited it. The student is responsible for the final document submitted.

I trust you find the above in order.

Regards

Hazvinei Majonga
Registered Board: South African Translators Institute
Membership Number :10033691