The Vulnerability of Women to Droughts in Mudzi District, Zimbabwe: The Complexities of Livelihood Strategies and Responses

By

Tendai Chigavazira

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Short Abstract

Globally, the body of literature on climate change responses is heavily centred on the description of climate change adaptation strategies and perceptions thereof; yet misses the in-depth analysis of the selection and application of the different response strategies in drought scenarios. In bridging this gap, this study found that despite the recurrence of droughts, women in Mudzi district continue to rely on rain-fed agriculture and natural livelihoods; which poses challenges to their livelihoods thereby contributing to their vulnerability. The purpose of this study was to understand and explain the vulnerability of women to droughts through identifying and analysing the livelihood strategies employed by women and how they respond to droughts. Although the ultimate goal of employing different response strategies is to build resilience to droughts, there are complexities associated with the strategies which confine the women to vulnerability to droughts. The study employed the conservation of resources (COR) theory and ecological theory in understanding the issues of vulnerability, adaptation and coping. The theories were complemented by the application of the sustainable livelihoods framework in analysing the vulnerability of women to droughts focusing on the vulnerability context, livelihoods employed, coping mechanisms, and adaptation strategies which are concepts derived from the above theories. In addition, there was a reflection and inclusion of the gender and climate variability concepts on the sustainable livelihoods framework as an integrated approach with the context built on droughts and women. The study followed a qualitative approach and data was collected through the utilisation of semi-structured interviews, observation method and document review tools. The study confirmed that women in Mudzi district continue to rely on rain-fed agriculture despite its unreliability. This was due to lack of viable alternative livelihoods which is attributed to low educational attainment, inadequate financial capital, and issues pertaining to attitudes and perceptions which limit behavioural changes. Moreover, the institutions that exist continue to promote the suppression of women through confining them to their gender

roles thus limiting their power and reproducing the women's vulnerability. In addition, the political and socio-economic landscape hindered women from realising their potential as it was marred by disputed participation, unaccountability and mistrust; all which underpin poor governance. In attempting to explain the vulnerability of women to droughts, the propositions in the COR theory and ecological theory had limitations as they were based on assumptions, thereby falling short in elaborating the parameters in which the theories could be applied. Assumptions are problematic when confronting the reality as they ignore the contribution of behaviour in the selection of coping mechanisms and adaptation strategies which have a bearing on the vulnerability of women to droughts. Although the element of behavioural change is illuminated in the behavioural theories and applied in some studies such as HIV and AIDS, this element is missing in drought literature. As a result of this study, the behavioural change elements emerged from the data that was analysed and this generated a novice understanding and explanation of the vulnerability of women to droughts. Behavioural aspects are relevant in understanding the dynamics associated with drought responses and shape the drought discourse beyond the traditional arena better. This study proposes the need to redirect efforts in ensuring that issues of behavioural changes are addressed through changing attitudes and perceptions in responding to droughts at both individual and institutional level. Although the COR theory and ecological theory modelled this study, the elements of behavioural theories have a stronger interface in understanding the vulnerability of women to droughts, which underlie the contribution of this study hence are relevant in the discussions of droughts.

Key Words: droughts, coping mechanisms, adaptation, livelihoods, vulnerability, women

Long Abstract

Globally, the body of literature on climate change responses is heavily centred on the description of climate change adaptation strategies and perceptions thereof; yet misses the in-depth analysis of the selection and application of the different response strategies in drought scenarios. In similar global studies that focus on gender and droughts, there are contradictions on how women and men are impacted by droughts. In Zimbabwe, drought studies focus on coping, adaptation and impacts yet there is no analysis on why communities remain vulnerable despite the application of different response strategies. Moreover, the data is not gender-disaggregated. This study found that despite the recurrence of droughts, women in Mudzi district continue to rely on rain-fed agriculture and natural livelihoods which threatens their livelihoods thereby contributing to their vulnerability. The purpose of this study was to understand and explain the vulnerability of women to droughts through identifying and analysing the livelihood strategies employed by women and how they respond to droughts. The research questions that guided this study were: 1) How are droughts affecting the livelihoods of women in Mudzi district? 2) How are rural women in Mudzi district coping with and adapting to droughts? 3) Why are women in Mudzi district vulnerable to drought? Previous studies spell out the different livelihood strategies, adaptation strategies and coping mechanisms yet they do not analyse their contribution to the vulnerability of women to droughts. Although the ultimate goal of employing different response strategies is to build resilience to droughts, women are vulnerable to droughts as there are complexities that emerge due to the weaknesses, negativity and limitations of these strategies.

In the conservation of resources theory, Hobfoll (1988) argued that people have an innate desire to conserve the quality and quantity of their resources and limit any state that may jeopardise the security of these resources. He further pointed out that people must invest resources in order to protect themselves against resource loss, to recover from loss, and to gain

resources. Usually, women's resources are perceived to be of little value due to their position in the economy thus efforts should be directed to redressing the gender gaps that exist in resource allocation, availability and accessibility. By looking at different livelihood strategies and responses to droughts, the study found that livelihood diversification in and of itself does not guarantee that women will become resilient to droughts. It is the contextually-valuable livelihoods that generate sustainable income that can assist the women to overcome their vulnerability. However, the socio-economic and political context also plays a role in ensuring that the livelihoods are sustainable which calls for institutional reforms which in turn benefit the women in these communities. On the other hand, the responses to droughts are not a one-size-fits-all that can be replicated in all drought-stricken areas. An understanding of different contexts through the appreciation of how communities differ and the analysis of different responses to droughts in a given context assists in mapping out long-term, sustainable interventions.

According to the ecological theory, the principle of succession involves a long-term time perspective and draws attention to the historical context of a problem and the need for planning for a preferred future. In this study, it was found that although the women had experienced successive droughts for a long time, they could not successfully plan for a preferred future as there were dealing with many challenges on a micro level and bearing the brunt of trickle-down effects of macro-level misdemeanours. Through the analysis and appreciation of the relevant concepts that emerged from the conservation of resources theory and ecological theory, the elements of gender and climate variability were added to the sustainable livelihood framework with a focus on the vulnerability of women to droughts. The study utilised the qualitative research approach, and data was collected in a case study of Mudzi district through the utilisation of semi-structured interviews, observation method, and document review. A sample of 31 people that

included community women and men, government officials and NGO officials from Mudzi district were interviewed.

The major findings of this study are that all the vulnerable women interviewed depended on agriculture for their livelihoods and applied unsustainable alternatives which did not generate sustainable income such as: casual labour, vegetable sales, pottery and petty trading. Adaptation strategies were minimal or covered a very small scale although the communities were aware of them. It was found that the government and NGO officials had invested so much knowledge and skills in the communities on adaptation strategies yet actual practice was minimal. The 2015 Zimbabwe Vulnerability Assessment Rural Livelihoods Report found that Mudzi district was characterised by 42% school dropouts which was the highest in the country. This was also confirmed from the data collected in this study; hence women were subjected to a cycle of poverty as there were generations of illiterate people. To a larger extent, this contributed to a lack of viable alternatives to agricultural production. Although the government and NGO officials invested knowledge and skills in the communities, without resources to implement, this was futile. Therefore, any knowledge and skills shared should be accompanied by adequate and sustainable resources to implement the response strategies to droughts and should be long-term to support women in building resilience to droughts. Based on the analysis of the findings of this study, there is need to apply holistic approaches in order to look at issues of feasibility and motives in modelling practical approaches in addressing the droughts effectively.

In attempting to explain the vulnerability of women to droughts, the propositions in the conservation of resources theory and ecological theory had limitations as they were based on assumptions thereby falling short in elaborating the parameters in which the theories could be applied. For instance, planning for a preferred future cannot be applied as a blanket statement to those who experience recurring droughts as there are many

factors that contribute to their responses. Assumptions are problematic when confronting the reality as they ignore the contribution of behaviour in the selection of coping mechanisms and adaptation strategies that have a bearing on the vulnerability of women to droughts. The utilisation of the conservation of resources theory and ecological theory was not enough in analysing the vulnerability of women to droughts as behaviour change issues emerged in this study, hence the behavioural theories were reflected on in further building these two theories. Although there are many studies that incorporate behaviour theories to understand social problems, the issue of behaviour change is a missing link in the drought literature especially in understanding and explaining the vulnerability of women to droughts. Behavioural change elements emerged from the data that was collected and analysed in this study which are pertinent in the drought discourse.

Issues of attitudes and perceptions need to be incorporated to allow behaviour change in tackling droughts thus steering women to move beyond the reliance on rain-fed agriculture despite its repeated failure. Behaviour change does not only apply to individuals but also to institutions that develop policies which continue to suppress women thereby reproducing vulnerability. The ecological theory assumes that people can plan for a preferred future when they understand their historical context and the conservation of resources theory assumes that people are able to invest resources in order to protect themselves against resource loss, to recover from loss, and to gain resources. Thus, this study augments the ecological theory and conservation of resources theory by bringing the behavioural change aspect through tackling issues of attitudes and perceptions in addressing the vulnerability of women to droughts.

The study suggests four propositions that are crucial to adapting to droughts. Firstly, accepting a situation and acknowledging that it might be the new normal is a prerequisite and calls for changed attitudes and perceptions. It is through changing one's attitudes and perceptions towards

droughts that one can begin to respond to them positively. Secondly, alternative options applied should be varied, viable and valuable. Livelihood diversification is promoted in droughts yet the emphasis should be on the viability and the value of such livelihoods. Thirdly, intentional learning promotes replication of skills and knowledge thereby enabling behaviour change. The transference of skills and knowledge should be central to adaptation to droughts with enough support to apply them effectively and sustainably. On the national level, there should be intentional learning from other countries that are managing droughts successfully and providing resources at a local level to promote best practices. Lastly, a constant awareness of the changes that occur with an attitude to adjust drives the need for adaptation. There are socio-economic, political and environmental changes that women should be conscious of that require adjustments.

Despite the influence of socio-economic, political and environmental changes, the application of negative coping mechanisms and weak adaptation strategies coupled with limited, unviable livelihood strategies is driven chiefly by behavioural predispositions at both individual and institutional level. This contributes to the vulnerability of women to droughts. Thus, this study proposes the need to redirect efforts in changing attitudes and perceptions at an individual and institutional level which perpetuate vulnerability to droughts in order for women to change their behaviour. Institutional reforms and civil participation should promote positive behaviour in drought management. Although the COR theory and ecological theory modelled this study, the elements of behavioural theories have a stronger interface in understanding the vulnerability of women to droughts, which underlie the contribution of this study to the body of knowledge, hence are relevant in the discussions of droughts.

Declaration

I declare that this thesis is my own, unaided work. It is submitted in partial fulfilment of the requirements of the degree of Doctor of Philosophy at the University of Witwatersrand, Johannesburg. It has not been submitted before any degree or examination at any other University.

…….

Signature

…….

Date

Dedication

My joy, my pride, my reason for toiling hard every day! Just to ensure that you have a better life than I had and a brighter future. This work is dedicated to my beautiful children Anashe and Anesu. No mountain is too high in this life, you can live to be the best and only the best there can ever be.

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Acronyms

AEASA	Agricultural Economists Association of South Africa
AGRITEX	Agriculture Research and Extension Services
AAAE	African Association of Agricultural Economists
AIDS	Acquired Immuno-Deficiency Syndrome
ATPS	African Technology Policy Studies
CA	Conservation Agriculture
CDKN	Climate and Development Knowledge Network
CGIAR	Consultative Group on International Agricultural Research
COR	Conservation of Resources Theory
DFID	United Kingdom Department for International Development
DNA	Deoxyribonucleic acid
DOI	Digital Object Identifier
DRR	Disaster Risk Reduction
EEA	European Environment Agency
EU	European Union
ENSO	El Niño-Southern Oscillation
FAD	Food Availability Decline
FAO	Food and Agriculture Organisation
FEWSNET	Famine Early Warning Systems Network
GDP	Gross Domestic Product
GII	Gender Inequality Index
HDI	Human Development Index
HES	Human-Environment Systems
HIV	Human Immuno-Deficiency Virus

ICRISAT	International Crops Research Institute for the Semi-Arid Tropics.
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IPCC	Intergovernmental Panel on Climate Change
ISS	Institute of Security Studies
KHOMAD	Knowledge Partnership on Migration and Development
LDC	Least Developed Countries
NEWU	National Early Warning Unit
NGO	Non-Governmental Organisation
OCHA	Office for the Coordination of Humanitarian Affairs
ODI	Overseas Development Institute
OECD	Organisation for Economic Co-operation and Development
ReSAKSS	Regional Strategic Analysis and Knowledge Support System for Southern Africa
SADC	Southern African Development Community
SST	Sea Surface Temperatures
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCC	United Nations Framework Convention on Climate Change
US	United States
USAID	United States Agency for International Development
WFP	World Food Programme
WHO	World Health Organisation
WIREs	Wiley Interdisciplinary Reviews
ZIMVAC	Zimbabwe Vulnerability Assessment Committee

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CHAPTER ONE

INTRODUCTION

1.1. Introduction

Zimbabwe has been undergoing political and economic challenges since the controversial land distribution in 2000 (De Villiers, 2003; Magede & Mukono, 2014). To aggravate the situation, Zimbabwe has been grappling with a series of droughts which has negatively impacted the most vulnerable people in the country (Manyeruke, Hamauswa, & Mhandara, 2013). However, Raftopolous (2004:1) argued that the origins of Zimbabwe's crisis pre-date independence for "it is analytically impossible to discuss the problems on internal politics, economics and land reforms without an understanding of the colonial inheritance". Prior to 2000, Zimbabwe experienced droughts in 1982-1984, 1986-87, 1991-92, and 1994-1995 (Kinsey, Burger, & Gunning, 1998) and this has worsened post-2000 as successive droughts have been rampant (Mutangi, 2010). In a period of ten years, there have been four successive droughts, that is, 2002-2003, 2004-2005, 2007-2008 and the 2011-2012 period. The 2015/2016 period experienced one of the worst El Nino induced droughts which further paralysed the already constrained agricultural sector (Southern African Development Community (SADC), 2016). The nation was once the bread basket of the SADC (Goto, 2014) yet today the once booming agricultural production has dwindled and has been overshadowed by multiple socio-economic and political challenges. In addition, Manyeruke et al*.,* (2013) reported that there has been an increase in food and nutrition insecurity in Zimbabwe due to climate variability and socio-economic challenges.

According to Ngaira (2007), most developing countries depend on agriculture for their economies; and according to the Food and Agriculture Organisation (FAO) and the World Food Programme (WFP) (2009), crop production, livestock rearing or a combination thereof constitute the primary

livelihoods in the rural provinces of Zimbabwe. Many women are vulnerable to climate variability as they are on the frontline of rural development which is normally agro-based (Nellemann, Verma, & Hislop, 2011; Sharma, 2016). However, this does not apply to every community as there are a few exceptions whereby women are more resilient to droughts than men as found in the study by Wawire (2003). The vulnerability of women to droughts exposes them to challenges, which has a bearing on their livelihoods. Moreover, their coping and adaptation strategies are unlikely to buffer them successfully as they emerge from a weaker position which brings the issue of complexities which are central to this study.

For this study, complexities refer to the features of the many interacting elements that cannot be understood with one explanation but should be given a holistic interpretation depending on the context. The complexities of livelihood strategies and responses to droughts are derived from their weaknesses, limitations, and negativity. In the context of this research, with regards to response to droughts, coping is short term (seasonal to annual) whereas adaptation is long term (decades to centuries). Selvaraju, Subbiah, Baas, and Juergens (2006:7) define vulnerability as “the degree to which a unit is susceptible to harm due to exposure to a perturbation or stress, and the ability of the exposure unit to cope, recover or fundamentally adapt.” It is therefore important to note that men and women experience vulnerability and resistance to climate variability differently. Vulnerability can be understood contextually hence the vulnerability of women and men in Mudzi district might not be relevant in a different community.

Although the central domain of this study is on vulnerability, the notion of resilience is embedded in this study as coping mechanisms, adaptation strategies and livelihoods strategies form the parameter in which positive responses to droughts are analysed. Ranjan and Athalye (2009) described drought resilience as the capacity of farmers to survive a certain number of consecutive droughts. In the same perspective, Ranjan (2011:4) elaborated

that “a farmer is drought resilient if he can survive the most difficult of the dry years and recover back to pre-drought conditions after the droughts have ended”. Furthermore, Hoddinott (2014) expounded that resilience in individuals reflects both individual traits and the presence of a supportive and nurturing environment. The ultimate goal of employing different response strategies is to build resilience to droughts, however due to the weaknesses, negativity and limitations of these strategies; women are confined to vulnerability to droughts which brings the issue of complexities of responses.

The study was necessitated by the limited research in Zimbabwe on the vulnerability of women to droughts despite the recurrence of droughts in the country. The National Gender Policy of Zimbabwe calls for research on climate variability and gender issues with a focus on disaggregating data thereby addressing the challenges posed by environmental changes (Ministry of Women Affairs, Gender and Community Affairs, 2013). Hence this study is relevant for policy making at a national level to ensure gender equality at community level vis-à-vis management and protection of environment and natural resources. In addition, the study reflected on the conservation of resources theory and ecological theory in order to bring new dimensions related to coping with special attention on the premises of investment and planning for a preferred future.

1.2. Background

1.2.1. Small-holder farming and droughts

In this section, the researcher reflects on small-holder farming and droughts as the majority of women in rural areas practice subsistence farming hence it is important to focus on this type of farming and the implications of droughts thereof. Droughts affect groups of farmers differently depending on their scale of farming and vulnerability. There has been an insurgence of small-holder farming in Zimbabwe since 1980s but what has been

questionable is the sustainability and broadness of such (Whiteside, 1998). The Department of Agriculture, Forestry and Fisheries (2012) highlighted that the definition of small-holder farming depends on the context, country and even ecological zone hence attempted to define small-holder farmers as those farmers owning small-based plots of land on which they grow subsistence crops and one or two cash crops while relying almost exclusively on family labour.

Small-holder farming is characterised by simple, out-dated technologies; low returns; lack of collateral or security; low income; high seasonal labour fluctuations; and women playing a vital role in the production (Altieri & Koohafkan, 2008; Baloyi, 2010; Department of Agriculture, Forestry and Fisheries, 2012; Mpandeli, Nesamvuni, & Maponya, 2015). Jennings and Magrath (2009) highlighted that the smallholder farming sector is vulnerable to droughts due to overdependence of existing farming systems on rain-fed agriculture, compounded by factors such as widespread poverty and weak financial and structural capacity.

There are a number of studies that have been undertaken to look at the constraints of small-holder farmers in light of the droughts and perceived climate changes (Altieri & Koohafkan, 2008; Baloyi, 2010; Mudombi-Rusinamhodzi, Siziba, & Kongo, 2012; Munhande, Mapfungautsi, & Mutanga, 2013; Unganai & Murwira, 2010). What emerges from these studies is consistent in Southern Africa although in some regions, more constraints are stated. Issues that arise include but are not limited to: shortage of labour, lack of information, lack of seeds and fertilizer, pests and diseases, lack of credit, lack of market for produces, and so forth. In light of the need to boost small-holder farmers to be viable and incorporated in the economy, what continues to emanate is that even in instances when some of the constraints are dealt with, there is still vulnerability to droughts.

According to the Food, Agriculture, and Natural Resources Policy Analysis Network (FANRPAN) (2013), efforts have been made to assist smallholder farmers in increasing their production but have been futile as not all technology was appropriate or productive in all conditions. Among the successfully adopted technologies by small-holder farmers are: in-field rain water harvesting, small reservoirs and Zai pits. In contrast, the research conducted by Unganai and Murwira (2010) in Chiredzi district found that there was no yield of sorghum varieties although Zai pits were utilised. However, in the same research, in-field rain water harvesting yielded much thereby confirming its success rate as highlighted by FANRPAN. The inconsistencies of data regarding adaptation affirm the inapplicability of these strategies as an umbrella model across different regions.

Of notable importance is the data from Munhande et al., (2013) on gender responses to droughts in Zimbabwe where they found that soil and water conservation, irrigation, gardening and change of planting and harvesting dates were more common in male headed households compared to female-headed households. Gender dynamics play a big role in the responses to droughts hence there is need to understand how women select their adaptation strategies and coping mechanisms to droughts and what makes them vulnerable. The next section discusses the impact of droughts on livelihoods in different contexts and similarities and contrasts are deliberated on.

1.2.2. The impact of droughts on livelihoods

According to Ribot, Magalhaes, and Panagides (1996), impact assessments map out direct consequences of a climatic event such as water shortages, reduced crop yields, livestock losses, hunger and so forth. However, vulnerabilities to these need to be looked at in their physical, social, political-economic relations and processes. Droughts threaten the sustainable livelihoods of any society posing economic, social, and environmental consequences (Wilhite, 2000). Droughts are not isolated to poor

communities; there are a myriad of challenges that are embedded in these communities that weaken the economies and social relationships hence deepening the vulnerabilities and poverty. While a lack of rainfall is the underlying cause of drought, diverse socio-economic, biological and agricultural factors determine the severity of its impact (O'Farrell et al., 2009).

Impacts of droughts often linger for months or years beyond the termination of the event and the effects are aggravated by human or social factors (Anjum et al., 2012). Drought is a natural hazard that tests the development strength of a nation as it has a bearing on the most vulnerable people such as women, children, the elderly, the sick, the disabled and female-headed households. Drought can be disastrous if there are no mechanisms and policies in place on how to manage them. Udmale et al., (2015) found in his research in India that respondents with large family size, low to marginal land holding size, low income, and rain-fed farming systems are found to be more vulnerable to drought impacts. In this study, the researcher refers to drought as a natural disaster which severely affects the most vulnerable people in society.

However, Makoka (2008) found that the wealthier households were not affected severely by droughts because they had different means of protecting their consumption. Nonetheless, the wealthier households reported higher food prices than the poor households as the poor households were relying on food assistance thus limiting their purchases in local shops. Receiving government's agricultural input subsidies cushioned the poor households whereas the wealthier households were faced with high farm input prices (Makoka, 2008). Huho et al., (2010) indicated that food relief was distributed to farmers and pastoralists based on the severity and duration of droughts. Safety nets assist communities in enduring the hardships resulting from droughts although as indicated by the study in

Malawi, it creates a false state of affairs for the poor yet the wealthier groups manage it with their diverse livelihoods.

In Nicaragua, Segnestam (2008) found that people dependent on natural resources for their livelihoods are directly affected by the drought while those that do not depend on natural resources for their livelihoods are indirectly affected through increased food prices and reduced sales. In contrast to the general perception that women are the most hard-hit by droughts, in Nicaragua, males were more negatively impacted as they were agro-pastoralists who depended on natural resources for their livelihoods whereas women depended on non-natural resources-based livelihoods such as pottery, sales, remittances, or other gifts and loans. It can therefore be said that the impacts of drought vary from one community to another depending on their livelihoods and vulnerability context. Segnestam (2008) in her research of gendered impacts of droughts in Nicaragua concluded that female headed households do not suffer as many impacts, in absolute terms, since they have fewer resources to lose. Despite her findings that men were hit hard by droughts, she concluded that women were more vulnerable to droughts and this seems to distance impacts from vulnerability. However, the vulnerability context of a community to droughts is an enabling ground for socio-economic challenges to be magnified with little or no control of the ripple effects.

Nhemachena and Hassan (2007) noted that agricultural production is the main source of livelihoods for most rural communities in developing countries such as sub-Saharan Africa. Due to droughts, agricultural productivity is affected especially for the rural communities who do not practise irrigation or use other water harvesting mechanisms. In addition, Sahu (2013) highlighted that droughts contribute to food and livelihood insecurity, increased poverty and vulnerability, loss of vegetation and adverse gender inequity. In his study of the impact of drought in India, Sahu (2013) found that in one region, inadequate water availability and failure of

food crop production are perceived as major adverse impacts on households, yet for the other region which was a water and food deficit state, the state managed water resources and food better. On other hand, Udmale et al., (2015) found that people travelled for longer distances, increasing the time by double, to fetch water as the nearby sources of water had dried up; and also experienced crop losses. Droughts have social impacts which emanate from the general impacts of crop and livestock losses; and water scarcity. In Kenya, Aklilu and Wekesa (2002) reported that droughts undermined the households' social position by causing families to break down and split, and also damaged social safety networks, friendships and borrowing capacities.

The case studies discussed in this section show that different regions experience drought in different ways which makes this study relevant in looking at a different locale to understand the challenges faced and the vulnerability of women thereof. In the next section, the researcher looks at vulnerability of women to droughts vis-à-vis the studies undertaken in other countries.

1.2.3. Vulnerability of women to droughts

No known study has been undertaken to look at the vulnerability of women to droughts in sub-Saharan African yet this region has been affected by severe droughts with the recent 2012 Horn of Africa attracting much attention in the humanitarian field. Extreme weather events only become disasters when converging with vulnerabilities (Anjum et al., 2012). Being exposed to a hazard in itself is not a challenge but how one copes or adapts or recovers from the effects determines one's vulnerability or resilience to hazards such as droughts. The responses to hazards are influenced by one's class position, gender, age, socio-economic status and social protection as illustrated in Table 1. All the components mentioned in Table 1 cannot be ignored when looking at one's vulnerability to droughts and for

this research; the focus is on women's vulnerability to droughts in relation to the coping mechanisms, adaptation strategies and livelihoods employed. On the other hand, Anjum et al., (2012) highlighted that increased frequency of occurrence of the natural event (i.e., meteorological drought), changes in the factors that affect vulnerability, or a combination of these elements, therefore the magnitude of drought impacts may increase in the future.

Table 1: Components of Vulnerability

TYPE OF VULNERABILITY	COMPONENTS	DETERMINANTS
Livelihood vulnerability	income opportunities; livelihood type; entry qualifications; assets and savings; health status	class position; gender; ethnicity; age; action of state:
Self-protection	building quality; hazard protection; location of home/work	Socio-economic: as above, plus technical ability or availability; Hazard-specific: return period; intensity; magnitude;
Social protection	as above plus: building regulations; technical interventions	as above, plus: level of scientific knowledge; level (and characteristics) of technical practice: type of science and engineering used by state and dominant groups;

Source: Cannon (1996)

In a Kenyan study conducted by Wawire (2003), it was found that men's authority as household heads and breadwinners was diminished as women were in charge of the famine relief food. On the other hand, women faced constituted lack of time and energy to perform their gender roles under the drought conditions. In a similar study in Australia, Stehlik, Lawrence, and Grey (2000) found that women experienced stresses and hardships caused by droughts differently in that those that had supportive spouses, were less overwhelmed. This concurred with the data collected in Zimbabwe where married women were better off than the widowed women due to the better

sources of livelihoods they employed. In concurrence to the Australian study, Arku and Arku (2010) found that in Ghana, women worked more hours than their male counterparts during droughts because men were not supportive as their culture did not approve of men getting involved in reproductive work. It was established in the study that men in the villages were under-employed during droughts and 50% migrated to urban areas where they found work but did not bring remittances home. Instead they found concubines in the cities hence spread sexually transmitted diseases including HIV.

The three studies discussed above are from three different settings and locales thus only slight similarities can be derived from them. It is however important to note that the Kenyan study by Wawire (2003) portrays women as stronger than men as they received aid. In contrast, a study in Horn of Africa by Mwangi (2007:21) revealed that, “men are the breadwinners, they own land, livestock and any other property, including women who are less important than livestock and whose rights, duties, obligations and status men define.” In this context, women do not own anything which poses vulnerability on female headed households, widows, disabled and deserted women. Von Kotze (1996) stressed that women are most vulnerable because they are generally poorer than men, have less access to and control of resources, and many traditions and laws restricted their means to become independent and take up positions of power. She further argued that this reinforces the stereotype of helplessness in women yet it is their position in society that makes them weak. Segnestam (2008) concurred with Von Kotze (1996) that women are more vulnerable than men and female heads of households even worse than men in male headed households due to their limited access to assets, decision making power, and freedom of choice. This is however contextual and might not be applicable to every setting.

Given the scenarios above, it is important to look at the vulnerability of women in context and understand the social dynamics that make them differ from one society to another. Therefore, this study unpacked women's livelihood strategies and also the coping and adaptation mechanisms in order to understand their vulnerability to droughts. Enarson and Morrow (1998) in their book, the *Gendered Terrain of Disasters*, concluded that disasters do not impact women and men in uniform ways, nor all women uniformly thus there is need to plan for droughts considering varying life conditions in order to meet specific needs.

1.2.4. The role of culture and influence of patriarchy in drought response

Drought responses emerge from the facets and indoctrination of culture and perpetuation of the patriarchal systems that are centred from ideological beliefs, traditions and norms. Segnestam (2014) indicated that because the culture works in favour of men, they are able to build assets on assets thereby increasing their adaptive capacity. In contrast, women continue being vulnerable as their options are limited. In interviews conducted by Dometita (2017) in Turkana, Kenya, one male argued that the Bible says man were created first and society therefore has given men certain powers over women thus the culture does not recognize women's privileges or position of power as they are meant to supplement men in everything they do. INIDE (2005) noted that culturally in Nicaragua, the house is for the woman and the land is for the man. This notion is central in understanding the Shona culture in Zimbabwe which embraces the concept of "*musha mukadzi"* which means that a home is made by a woman; yet when one observes deeper into the home, major decisions are endorsed by a man. Mutasa (2010) found in his study in Zimbabwe that the majority of the farmers inherited their lands from their fathers or forefathers and the land was registered in the name of the father of that family or the eldest male in the homestead, which reflects the patriarchal system that still discriminates against the women. Moreover, this shapes the dialogue of who has access

to and control of the land thereby illuminating the debates in the role of culture and influence of culture in drought response.

According to Petros, Terefe, and Dico-Young (2017), women in Somalia culture have limited decision making powers in the household or over household assets and resources hence their powers rest in all domestic and unpaid care work related to reproductive health issues and household care activities such as caring for the children, cooking and collecting water and fuel. Similarly, in Nicaragua, Segnestam (2017) found that the division of other forms of capital and the division of labour were highly gendered thereby leading to gender-differentiated vulnerability to drought. Despite having the decision-making rights over reproductive health issues, the women do not have information or access to reproductive health and family planning services due to the social norms that hinder them (Petros et al., 2017). Although the study found that women and men jointly made decisions on food and cash assistance received from donors, women in mixed male-headed households had relatively low decision-making powers over the assistance compared to men. Making joint decisions shadows the deliberations and battles of power dynamics within the confines of a household thus it is subjective to the premise in which the decisions are made.

Petros et al., (2017) found that during a drought, men migrate in search of work and women's unpaid work in the households double as they travel far to search for firewood and fetch water. Nonetheless, it should be noted that the culture does not appreciate men in engaging in such activities as they are considered to be shameful. Hence the men's presence in a household is of little value in the daily contribution of the house chores. In retrospection, Dometita (2017) asserted that the more frequent and intense droughts become, the greater the burden women must carry in terms of performing reproductive and productive roles, as well as additional community roles. Segnestam (2017) highlighted that traditional norms on the view of women

and their roles in society as mothers and responsible for the household have not changed much despite the transformations in Nicaragua and the call for the emancipation of women.

Dometita (2017) however noted that there are gender shifts in Kenya as life becomes tougher with the frequent shocks and stresses, which is allowing women to make decisions on access to and to some extent control of resources and even engage in non-traditional activities. Similarly, Segnestam (2014) found that there is a change in culture in younger generations in Nicaragua, whereby women are living more like men thereby reducing their dependence on men. This observation is similar in various contexts especially in the urban centres however, women are still expected to undertake their unpaid work as a duty in the community, homes and extended families. Thus, despite the gender shifts in some countries, the issues of patriarchal systems and culture still surface in various engagements. Moreso, in the deliberations of drought responses which are strictly confined in the traditional settings. Zimbabwe still has a journey to undertake to address issues of culture and patriarchal systems amidst the political, socio-economic and environmental challenges it faces. These issues are cross-cutting in the realization of resilience of women to droughts.

In the next section, the researcher looks at the Zimbabwean context with special attention to the socio-economic context, environmental context and the legislations governing the environmental and disaster management issues which are relevant to this study.

1.3. Study Area

1.3.1. Socio-economic context

Zimbabwe has undergone a myriad of socio-economic challenges that have crippled its development. The highest levels of economic growth were

recorded between 1980 and 1990 with an average GDP growth rate of 5.5% - higher than the average for sub-Saharan Africa during the same period (Brown et al., 2012). However, economic performance declined sharply between 2000 and 2008 due to economic mismanagement, governance issues and the loss of international support coupled with the Zimbabwe's Fast Track Land Reform Programme (Brown et al., 2012). Before the land redistribution programme, Zimbabwe was regarded as the bread-basket of the Southern African region, being self-sufficient and a net exporter of food (Shizha & Kariwo, 2011) yet the agriculture sector has declined significantly since the Land Reform exercise (Beirinckx et al., 2015). According to the Government of Zimbabwe (2010), agriculture accounts for approximately 15-18% of Zimbabwe's GDP and approximately 60% of the raw materials required by the manufacturing industry and 40% of total export earnings.

Munangagwa (2009) indicated that Zimbabwe's economic decline since 1997 has seen the country's macro-economic condition deteriorate progressively into a hyperinflationary environment. According to the International Organisation for Migration (2010), the country's Gross Domestic Product (GDP) cumulatively declined by 46% between 2000 and 2007. The unstable economy resulted in a massive exodus of Zimbabweans to overseas or other neighbouring countries (International Organization for Migration, 2010). In divulging the depth of the current crisis, Munangagwa (2009) reported that Zimbabwe once had the fourth strongest economy in the world and was ranked among many middle-income countries such as Turkey, Singapore, Malaysia and Nigeria in the 1970's and used to engage in trade with the US and Europe. Zimbabwe adopted the US dollar in 2009 as the main currency which saw a bit of economic recovery and the reduction of inflation to 2.76%, with only mining and tourism being the main economic activities (Beirinckx et al., 2015). However, currently the economy is further shrinking rapidly - epitomized by company closures and large-scale retrenchments and limited disposable incomes (Beirinckx et al., 2015).

Zimbabwe has an estimated population of 13 million and the highest literacy rate of 97% in Southern Africa (Zimbabwe National Statistics Agency, 2013a). According to the Zimbabwe National Statistics Agency (2014), school drop-outs are more prevalent in rural areas compared to urban areas, with tertiary institutions attracting only 3.2% students from rural areas compared to 14.3% from urban areas. Twenty years after independence, Zimbabwe had achieved universal primary education yet the benefit of this was eroded due to economic and political factors (Shizha & Kariwo, 2011). Underfunding of education following the economic adjustment programmes of the 1990s and early 2000s was exacerbated by the economic meltdown that followed the land redistribution programme initiated by the ruling party in the year 2000. According to Thouvenot (2014), Zimbabwe's educational infrastructure has crumbled, teachers have left, educational resources have been depleted, and the quality of the system has been eroded. There are educational inequalities in Zimbabwe between the poorest and the well-off children; and between those from rural and urban areas, and this is reflected in actual learning, rather than simply enrolment and progression (Beirinckx et al., 2015).

Despite Zimbabwe's ratification of the Convention on the Elimination of all forms of Discrimination Against Women (CEDAW), the country has a hybrid legal system composed of statutory and customary law in which the statutory law complies with CEDAW, and discriminatory customary laws apply especially in rural areas (Beirinckx et al., 2015). Foucault highlighted that the manifestation of power may be an effect of a prior or permanent consent, but it is not by nature the manifestation of a consensus (Faubion, 2000). He further argued that power is exercised over people with a field of possibilities in which several kinds of conduct, several ways of reacting and modes of behaviour are available. In the same vein, Gupta and Ferguson (1997) explained that an individual can be someone's subject by control and dependence or tied to his own identity by conscience or self-knowledge. Power dynamics in rural areas such as Mudzi district subjugate women as

culture dictates the behaviour of different subjects. Although there are liberties on how women behave in urban settings, once they are under male domination, certain rights are suppressed by virtue of subordination. Moreover, economic dependence mars any form of freedom unless the relationship between a male and a female is bound by other mutual values which promote respect for the woman.

The socio-economic context described above is broad but can be applied in Mudzi district as a unit of study. According to the Zimbabwe National Statistics Agency (2013b), Mudzi district has an estimated population of 133,252 with 52.4% of the households female-headed. The literacy rate of Mudzi district stood at 91% in 2012. The Zimbabwe National Statistics Agency (2013b) estimated that 69.3% of the population in Mudzi district works in the agricultural sector with only a 5.4% unemployment rate in the district. It can however be argued that although there is 5.4% unemployment rate in the district, it does not reflect the poverty and vulnerability levels in the community. A combination of successive droughts in the country, with 69.3% of the population working in the agricultural sector, poses a threat to their main source of livelihoods hence making them vulnerable.

In 2012, the infant mortality rate in Mudzi district was 60 out of 1000 live births; and the maternal mortality ratio was 628 out of 100,000 live births, which is one of the highest in the Mashonaland East province (Zimbabwe National Statistics Agency, 2013b). Given that small-holder farming depends on intensive labour input from family members, the statistics have a bearing on human resources. Moreover, the health of women who are the most vulnerable members in a community can arguably have an impact on agricultural production.

The socio-economic challenges of a community influence its development hence the connection between these challenges and the occurrence of droughts concurrently destabilises the most vulnerable groups which

include women. This background influenced the analysis of the vulnerability of women to droughts in Mudzi district through understanding different livelihood strategies and the responses that women apply when faced with droughts.

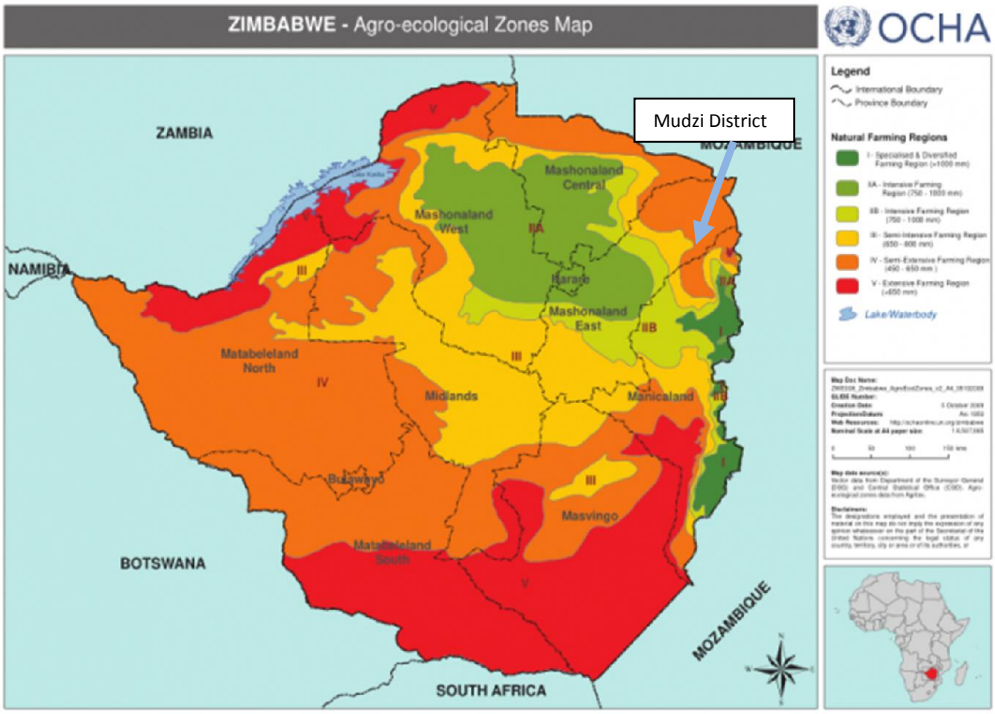
1.3.2. Environmental context

Zimbabwe is a landlocked country in Southern Africa that borders South Africa, Mozambique, Zambia, Namibia and Botswana. The 2014 Labour Force Survey estimated the population of Zimbabwe to be 13.4 million, with 68% in rural areas (Zimbabwe National Statistics Agency, 2016). Zimbabwe's total land area is about 39 million ha; of which about 32.6 million ha is dedicated agricultural land. The remaining land is used for national parks, wildlife areas, forests, and urban settlements. The economic collapse of the country between 2000 and 2008 coincided with temperature increases, erratic rainfall patterns and recurrent droughts, all of which exacerbated suffering, especially for people living in rural areas where approximately 62% of the population resides (Brown et al., 2012). Although the drought in early 2000 is blamed for Zimbabwe's inflationary economy, the annual rainfall was significantly higher than the average of 754mm and contributed only to one-seventh of the overall downturn (Munangagwa, 2009).

Zimbabwe has five agro-ecological regions as reflected in Figure 1 and most crop production is done in Regions I, II, and III because of their conducive climatic conditions (Manyeruke et al., 2013). Regions IV and V are more drought-prone and have become drier than before yet they constitute 74% of the land of Zimbabwe where the majority of the smallholder farmers are based (Musiyiwa, Leal Filho, Harris, & Nyamangara, 2014). The Land Apportionment Act (LAA) of 1930 and the Land Tenure Act of 1969 provided a platform for land alienation in which white settlers seized the best of the land, about 18 million hectares in prime and fertile arable land which is mostly in agro-ecological regions I, II and III, with good rainfall patterns

(Mazingi & Kamidza, 2010). In contrast, the worst, remote, low lying, in some cases tsetse fly-ridden poor soil, unreliable rainfall and less suitable for meaningful agricultural activities in agro-ecological regions IV and V, was left to black peasant farmers (Mazingi & Kamidza, 2010).

Figure 1: Agro-ecological Map of Zimbabwe



Source: Office for the Coordination of Humanitarian Affairs (2009)

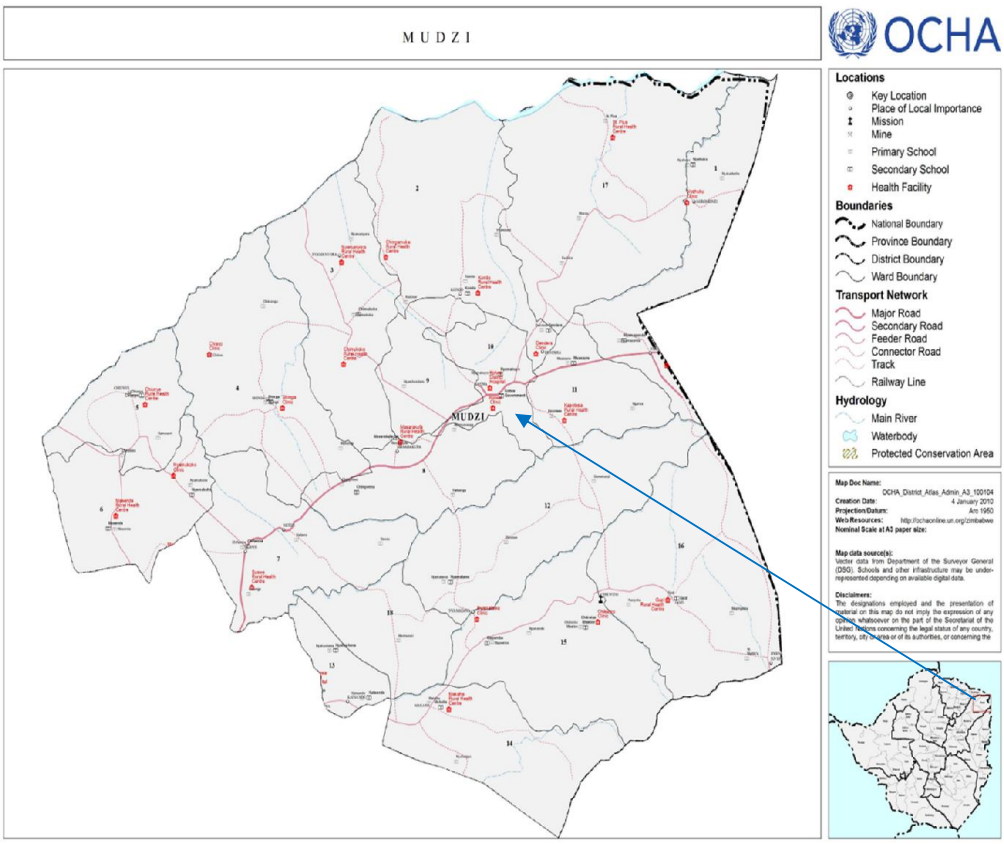
After independence, attempts were made to redistribute land even through the Land Acquisition Act of 1992 which was very slow and benefited the cabinet ministers, top civil servants and the army generals (Ness & Cope, 2016). Karumbidza (2002) noted that the state is under pressure to redistribute land whereas the donors demand the maintenance of the status quo through prioritising the needs of settlers and misalignment of land reform funding to addressing world poverty. The stifling and suppression of the land reform exercise by different interested parties contribute to an upheaval and tensions which was exhibited in the case of Zimbabwe.

According to Zamchiya (2011), the land issue could have been dealt with systematically instead of the Fast Track Land Reform. Inadequate government support through legal structures and finances, land ownership uncertainties and inadequate skills to manage the seized lands contributed to the low agricultural production in Zimbabwe (Thouvenot, 2014). Booysens (2003) argued that the land distribution plan would not have been beneficial without a rapid economic plan to alleviate the existing hunger, poverty and unemployment. Manjengwa (2010) pointed that the land-reform programme focused on the highly skewed racial imbalances of land holdings and discriminatory land-tenure systems but failed to mainstream the interests of women. However, Scoones et al., (2011) found that the Fast Track Land Reform exercise was not all about chaos, destruction and violence but there were unrecorded successes such as re-allocation of land to small-holder farmers who are currently practising mixed farming thereby creating entrepreneurial dynamism and productive potential. Furthermore, Scoones et al., (2011) argued that although there were some agrarian transformations and major problems in certain areas; agriculture has not collapsed as found in their study in Masvingo where some successful farmers are gaining surpluses as a result of their hard work. Similarly, Manjengwa, Hanlon, and Smart (2014) argued that the controversial disruptive nature of Zimbabwe's land reform process actually took people out of poverty thereby empowering women as part of smallholder commercial farming.

Nonetheless, research by Mugandani, Wuta, Makarau, and Chipindu (2012) has shown that there have been significant changes in size, structure and composition of the five regions, with region II shrinking by 49% in size and region III by 14%. Brown et al., (2012) pointed that the changes in climate have contributed to the shifts of the agro-ecological zones. For example, Chinhoyi and Chibero and their surroundings have shifted from natural region II to natural region III while Kwekwe and its surroundings have shifted from natural region III to natural region IV. In addition, natural region I has

reduced in size, natural region II has shifted further east and natural region III has shifted to the north. The changes in the different regions will likely reduce food production hence leading to increased food insecurity.

Figure 2: Mudzi District Map



Source: Office for the Coordination of Humanitarian Affairs (2008)

According to the Food and Agriculture Organisation (2000), about 80% of the rural population live in Natural Regions III, IV and V where rainfall is erratic and unreliable, making dry-land cultivation a risky venture. In addition, Manyeruke et al., (2013) indicated that the climatic conditions are drifting towards arid conditions which are not suitable for agriculture yet it is the backbone of Zimbabwe's economy. Musiyiwa et al., (2014) highlighted that fertile red soils are mainly found in agro-ecological region I whereas soils in agro-ecological region II, III and IV are mainly grayish-brown sands and sandy loams which are derived from granitic rocks that are associated with acidity, low cation exchange capacity and poor water holding capacity.

On the other hand, soils in agro-ecological V are variable and include vertisols, brown loam soils and sands and sandy loams.

Furthermore, Musiyiwa et al., (2014) pointed that the length of growing seasons ranges from 170-200 days for agro-ecological region I to 70-100/130 days for most of agro-ecological region IV. According to Unganai (2000), the annual rainfall variation, including the onset, intensity, duration and cessation of rainfall greatly impact socio-economic and agricultural activities in Zimbabwe. Zimbabwe receives almost all of its rain during the five summer months from November to March, although the significant feature during the rainy season is its unreliability in terms of amount, duration and distribution (Moyo, Mvumi, Kunzekweguta, Mazvimavi, & Craufurd, 2012). Chagutah (2010) pointed that mean annual temperature varies from less than 15-18°C and can rise up to 30°C in the agro-ecological region I around October and in agro-ecological region V ranges from 23-25°C but can rise to over 40°C in summer. Figure 2 shows the Mudzi District map where the research was undertaken.

Mudzi district is in Mashonaland East province under region 4 of the agro-ecological zones. According to Mutami and Chazovachii (2012), Mudzi is a semi-arid region whose annual rainfall ranges from 400mm to 650mm; with average temperatures of 26 degrees. The soils are sandy, with scattered vegetation; therefore, there are scarce pastures for grazing (Misi, 2013). The region is marked by severe, concurrent dry spells which affect the rain-fed crops such as maize and cotton on which the communities heavily rely. According to the Parliament of Zimbabwe (2011), the people rely on subsistence farming and vegetable gardening as a source of livelihood. Another source of livelihood is gold panning.

Mudzi district depends on food aid yearly for their food requirements. It is within this region where the research was undertaken and this is in the agro-ecological region 4 where droughts occur frequently and affect the agro-

based livelihoods of the inhabitants. It was therefore important in this study to delve into the vulnerability of women to droughts in Mudzi rural areas and how they are responding in light of the recurring droughts. In the next section, the researcher looks at the different statutes in Zimbabwe that guide environmental issues.

1.3.3. The legislative and policy context

Zimbabwe boasts of different policies and legislations that govern the disaster management, environmental issues and the protection of poverty-stricken groups. Out of all the existing policies and legislations, this study prioritised the most relevant which are: the Social Welfare Assistance Act of 2001, the Traditional Leaders Act of 2001, the Civil Protection Act of 2003, Environmental Management Act of 2006, the National Gender Policy and the National Climate Change Response Strategy. This section discusses these statutes and policies and how they are applied to understand climate variability and gender issues.

The Social Welfare Assistance Act 1998, 2001 stipulates that grant social welfare assistance may be awarded to a destitute or indigent person where the person is over 60 years old or falls under the category of mentally or physically handicapped; or suffers continuous ill-health; or is a dependent of a person who is a destitute or indigent or incapable of looking after himself; or otherwise has a need of social welfare assistance. However, with the limited resources available to the government, it is difficult to ensure that the vulnerable groups are protected effectively. Moreover, it has become difficult to single out families who are really poverty-stricken in rural areas as droughts continue to ravage their agricultural production successively thus creating vulnerable villages.

According to the Traditional Leaders Act 1998, 1999, 2001, the chiefs ensure that the land and its resources are used and exploited within the confines of the law, in particular, controlling overgrazing, over-cultivation,

the indiscriminate destruction of flora and fauna, and generally preventing the degradation, abuse and misuse of natural resources in their area. They are also responsible for notifying the rural district council of the outbreak of any epidemic or prevailing disease, flood or other natural or unnatural disaster affecting the inhabitants, livestock, crops, the land, flora or fauna. In addition, the chiefs are responsible for promoting good standards of health and education; and assist the drought and famine agencies in coordinating relief and related matters through the directive of the district administrator or rural district council. Their responsibilities to the villages are of paramount importance yet they are reportedly marred by discrimination, unaccountability, and corruption. The interference of the chiefs in drought relief hampers accurate targeting as favouritism and intimidation obscure the good intentions of the programmes.

The Civil Protection Act 1989, 1992, 2001 was drafted in compliance with the Hyogo Framework of Action which is an international standard that ensures that disaster risk reduction is a national and local priority with a strong institutional basis for implementation. The framework seeks to identify, assess, monitor disaster risks, enhance early warning, and reduce underlying risk factors. The Civil Protection Act was revised three times and the current 2003 act stipulates the powers of civil protection officers and the circumstances that call for the declaration of a disaster. The act is silent about vulnerable groups and more specifically, ignores women's issues. Disasters come in varying severity hence cannot be handled in the same way. The Civil Protection Act 1989, 1992, 2001 has been criticised for its alignment to security forces hence people fail to understand its applicability.

In addition to the Civil Protection Act discussed above, Zimbabwe is guided by the Environmental Management Act 2002, 2006 which aims to provide for the sustainable management of natural resources and protection of the environment, the prevention of pollution and environmental degradation. The emanating environmental challenges may be stemming from the

mismanagement of the natural resources and environment; hence this act plays a role in minimising the emergence of disasters. In response to many debates that link natural disasters to climate change, Zimbabwe is developing the National Climate Change Response Strategy which is also significant in understanding the successive droughts in the country (Ministry of Environment and Natural Resources Management, 2013).

Social relations and environmental issues cannot be separated hence the National Gender Policy was written to cover the 2013-2017 phase, with the acknowledgement that there is limited gender consideration in policy frameworks on the management and protection of the environment and natural resources in Zimbabwe. The policy integrates the environmental management in order to respond to the evolving climate which has a bearing on both men and women. The focus on gender, environment, and climate change was against the background that Zimbabwe is an agro-based economy with 86% of the women involved in farming activities in rural areas. Although they are the majority, they are the most disadvantaged group thereby increasing inequalities due to climate risks involved with farming. An analysis of the key indicators of Gender and Environment in the National Gender Policy brings the notion that the department is not focusing on long-term but short-term responses. The proportion of population by sex sufficiently coping with climate change risks is an indicator that will be measured for success yet it is important to go beyond coping and seek for advanced, long-lasting, and effective ways of responding to climate issues.

The different statutes and policies provide an enabling environment for guiding issues dealing with disasters and environment management. However, the realisation of such policies and legislations might not be existent or effective or adequate due to the socio-economic and political challenges the country has been facing since 2000. On the other hand, Chagutah (2010) noted that there is an absence of gender in policy frameworks involving the management and protection of the environment

and natural resources in Zimbabwe, which is counterproductive because women often play central roles in adaptation and post-disaster recovery. The Parliament of Zimbabwe (2011) recommended that women in Mudzi district need to hold seats in local government structures in line with the SADC Protocol on gender. The presence of women in decision-making positions awards women a voice that addresses their plight through actionable policies. Despite the different policies and acts Zimbabwe drafted and passed, whenever droughts ravage the nation, the most vulnerable populations such as women bear the brunt. Thus, there was need to analyse the vulnerability of women to drought in relation to their livelihood strategies, coping mechanisms and adaptation strategies. The next section focuses on the research problem by giving attention to the problem statement, purpose statement, and research questions.

1.4. Research Problem

1.4.1. Problem statement

The drought phenomenon cuts across the global landscape. Different livelihood strategies and responses entrenched in communities, contribute to how vulnerable or resilient affected populations become. According to CARE (2011), vulnerabilities differ within countries, communities and households. In a study carried out by Neumayer and Plumper (2007) in 141 countries, it was found that men and women are affected differently by any disaster due to their social, cultural, and economic inequalities. Generally, the global body of literature on climate change responses largely describes the climate change adaptation strategies and perceptions thereof (Boansi, Tambo, & Müller, 2017; Grothmann, & Patt, 2005; Mase, Gramig, & Prokopy, 2017; Sahu, & Mishra, 2013; Shikuku, Winowiecki, Twyman, Eitzinger, Perez, Mwongera, & Läderach, 2017) yet misses the in-depth analysis of the selection and application of the different response strategies in drought scenarios. In addition, the narrative on adaptation strategies is rarely gender-disaggregated.

Moreover, the reviewed drought literature is silent about how an individual or institutional behaviour contributes to vulnerability, which is a key theoretical knowledge gap that this research found. How women select livelihoods in a given context and their response strategies to droughts can be understood through the lens of their attitudes and perceptions, thereby influencing their behaviour. In some instances, donor-funded institutions transfer skills to communities with good intentions to build resilience to droughts yet the effectiveness thereof is undermined by challenges of short project duration with no follow-up after project termination. There is a knowledge gap in understanding how institutions track the application of skills they transfer to communities, support the utilization of the skills and how the communities apply the skills learnt in building resilience to droughts, which calls for behaviour change in drought management.

In similar studies that focused on droughts and gender in different countries, that is; Ghana, Great Horn of Africa, Nigeria, Nicaragua, Australia and Kenya (Arku & Arku, 2010; Mwangi, 2007; Schroeder, 1987; Segnestam, 2008; Stehlik, Lawrence, & Grey, 2000; Wawire, 2003), there are some contradictions and differences on how women and men are impacted by droughts. Arku and Arku (2010); Mwangi (2007); Schroeder (1987); and Stehlik et al., (2000) portray women as vulnerable to droughts yet Segnestam (2008) and Wawire (2003) show women as more resilient to droughts as they relied on food aid and non-natural livelihoods respectively. Literature in Zimbabwe (Bola et al., 2013; Kinsey, Burger, & Gunning, 1998; Manyeruke et al., 2013; Mutasa, 2010; Ndlovu, 2011; Zvikomborero & Chigora, 2010) is silent about the vulnerability of women to droughts hence this study is important to delve into the research gap.

In light of the above global perspective, this study focuses on Zimbabwe, where there has been a recurrence of droughts since independence in 1980. Moreover, the country's climatic situation has worsened as droughts have become more frequent between 2002 and 2012 with four droughts

being recorded. Despite the recurrent of droughts, women in Mudzi district in Zimbabwe where the study was carried out, continue to rely on rain-fed agriculture and natural livelihoods which poses challenges on their livelihoods thereby contributing to their vulnerability. Although there are coping mechanisms and adaptation strategies in many communities, this does not make women more resilient to droughts as evidenced by the continuous reliance on food assistance from international organisations. In the last decade, droughts have been exacerbated by an ailing economy in Zimbabwe and political instabilities.

Many similar studies in Zimbabwe focus on socio-economic impact of droughts, coping and adaptation (Bola et al., 2013; Kinsey, Burger, & Gunning, 1998; Manyeruke et al., 2013; Mutasa, 2010; Ndlovu, 2011; Zvikomborero & Chigora, 2010) but miss the disaggregation of data by gender. It is important to disaggregate data by gender as women and men are affected differently by droughts. The Zimbabwe National Gender Policy drafted in 2013 calls for a focus on gender-disaggregated research on climatic issues. Demographics in Zimbabwe show that more women than men (sex ratio 1:16) are poor and live in rural areas where livelihoods are intimately linked with the exploitation of the natural resource base (Ministry of Women Affairs, Gender and Community Affairs, 2013).

Although there are successive droughts in Zimbabwe, literature relevant to Zimbabwe that focuses on the vulnerability of women is limited, for example, the closest study is on climate risk and smallholder farming (Mapfungautsi & Munhande, 2013) yet it is a quantitative study which lacks the analysis of vulnerability issues. Thus there was need to analyse different contexts and draw applicable conclusions regarding women's responses to droughts and explain their vulnerability. Moreover, all the studies including the global literature that the researcher reviewed focused on the descriptive and exploratory understanding of gendered vulnerability to droughts. This study was explanatory in nature through analysing and explaining the vulnerability

of women to droughts given the responses they employed hence enabling the researcher to advance the understanding of the issues in their complexity and root system.

Given a series of droughts in Zimbabwe and the evidence of women's vulnerability to natural disasters such as droughts in literature (Arku & Arku, 2010; Mwangi, 2007; Schroeder, 1987; Segnestan, 2008; Stehlik et al., 2000), this study is significant in explaining why women are vulnerable to droughts in light of their livelihood strategies and responses in the context of Mudzi district in Zimbabwe. Von Kotze (1996) posited that disaster management programmes need to consider gender if they want to reduce the risks of disasters. The problem necessitated the need to do more research on the vulnerability of women to droughts in Zimbabwe in order to document and find ways of mitigating them in a more effective way.

1.4.2. Purpose statement

The purpose of this study was to explain why women are vulnerable to droughts in Mudzi District while recognising differentials on the depth and levels of vulnerability between men and women. In order to explain women's vulnerability to droughts, the researcher explored how different livelihoods are affected. In responding to droughts, the study provided understandings on latent coping mechanisms and adaptation strategies in Mudzi District. Through this study, different stakeholders might have an understanding on how to respond to the emerging issues and draw policies in relation to climate variability and gender. The researcher reflected on the premises in the identified ecological theory, on coping with, and adaptation to droughts especially regarding the planning for a preferred future thereby contributing to the body of knowledge. The conservation of resources theory was also reflected upon regarding the premise of investing in order to protect themselves from resource loss, recover from loss and to gain resources.

1.4.3. Research questions

a. How are droughts affecting the livelihoods of women in Mudzi district?

The livelihoods of women determine their resilience hence if droughts strike their sources of income, depending on their various livelihood strategies; they either succumb to droughts or are resilient.

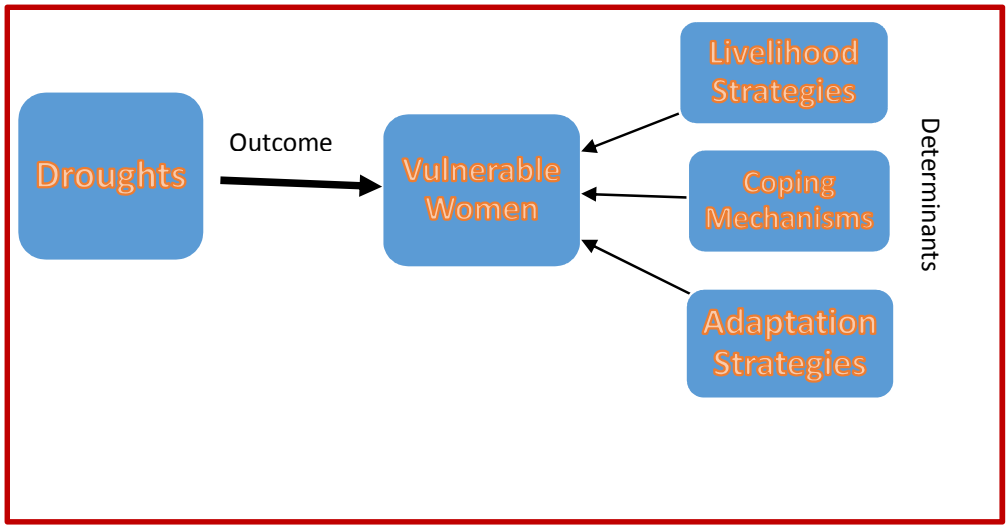
b. How are rural women in Mudzi district coping with and adapting to droughts?

Droughts are historic in Zimbabwe hence establishing how people cope with and adapt to them draws attention to the shortcomings of the continuous methods used versus the influence of the context.

c. Why are women in Mudzi district vulnerable to drought?

This question assists in explaining the vulnerability of women based on the livelihood strategies and their responses to drought. There are challenges that are posed by utilising certain livelihood strategies and responses to droughts.

Figure 3: Broad Conceptual Framework



Source: Own (2018)

Figure 3 shows that livelihood strategies, coping mechanisms and adaptation strategies determine how vulnerable the women can be to droughts. The weaker and negative the responses to droughts are, the more vulnerable become to droughts. The choices of livelihood strategies play a bigger role on how women are vulnerable to droughts. The main conceptual framework is presented in Figure 5 and the revised conceptual framework based on the findings of this study is presented in Figure 18.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

This chapter focuses on the relationships that exist between droughts, gender and livelihoods. Since droughts can be linked to climate variability, the concept of climate variability is looked at and the difference between climate variability and climate change is expounded. Climate variability and gender issues are located in the Development Management field which can be expanded to influence policy making and governance issues. Governance and social protection issues in drought management are discussed in this chapter. The researcher discusses the vulnerability of women to droughts, how they cope and adapt, and the impact of droughts on livelihoods. The gaps in the disaster management plans and policies in relation to gender are identified.

2.1.1. Definition of key concepts

a) Vulnerability

There are various definitions of vulnerability and Wisner, Blaikie, Cannon, and Davis (2003:11) defined vulnerability as "the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard". They further noted that "vulnerability can be measured in terms of the damage to future livelihoods, and not just as what happens to life and property at the time of the hazard event" (Wisner et al., 2003:12). According to IPCC (2001), vulnerability to climate change is a function of: (1) exposure to climate variability and change which refers to the degree of vulnerability that an entity experiences; (2) sensitivity to climate shocks and stresses, which is an assessment of the amount of impact climate factors have on an entity; and (3) adaptive capacity, which describes the ability of the entity to manage the negative impacts and take advantage of any opportunity that arise. Smit

and Wandel (2006) concurred with IPCC's definition by stating that vulnerability is a function of exposure to a hazard; sensitivity to that hazard; and the capacity of the system to cope, adapt or recover from the effects of those conditions. Vulnerability to climate change is defined as "the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes" (IPCC, 2001:995). Chambers (2006) defined vulnerability as the exposure to stress and contingencies, and difficulty to cope with them. He mentions two sides of vulnerability, that is, an external side of risks, shocks, and stress to which an individual or household is subject; and an internal side which is defenceless, meaning a lack of means to cope without damaging loss (becoming or being physically weaker, economically impoverished, socially dependent, humiliated or psychologically harmed). According to the IPCC (2014), vulnerability refers to ''the propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt." The researcher adopted the Chamber's definition as it is extended to look at the sides of vulnerability, that is, internal and external. Vulnerability extends beyond the current exposure to stress and shocks through manipulating weakened response systems, which confine victims to the status quo or exacerbate the situation, if not managed strategically and operationally.

b) Gender and Feminism

Risman (2004) conceptualised gender as a socially constructed phenomenon that is embedded in the individual, interactional, and institutional dimensions of our society. There is a concurrence among international agencies such as United Nations in conceptualising gender as socially constructed. The United Nations Development Programme (2009) defined gender as the differences in socially constructed roles and opportunities associated with being a man or a woman and the interactions and social relations between men and women. According to the World Health Organisation (2012), gender is a concept used to describe

characteristics associated with what is considered masculine or feminine in a given society. The characteristics include norms, roles or relationships of and between groups of women and men. Serote, Mager, and Budlender (2001) argued that the manner in which genders are assigned also depends on the ways in which gender relations are institutionalised and played out in a community or society. Furthermore, Serote et al., (2001) explained that the interaction of racially defined categories, class, geographical location, political power relations and ideological factors contribute to how women and men are gendered hence gendering is not universal. It is important to note that there have been on-going debates among African female scholars on the conceptualisation of gender using African women's perspective and experiences (Kolawole, 2004; Oyewumi, 2002). There is however a consensus in these debates that gender is socially constructed yet Chauraya (2012) believed that gender is learnt in Eurocentric perspective but in an African view, there is no separateness between nature and humans, and gender like sex is natural, fixed and un-interchangeable.

On the other hand, feminism deepens our understanding of gender through probing the pervasiveness of gender inequality. It is a social movement whose basic goal is equality between men and women (Lorber, 2005). It recognises gender inequality and the practice of working for a greater gender justice (Harnois, 2012). There are different types of feminisms, which include but are not limited to radical feminism, neo-liberal feminism, ecofeminism and socialist feminism. According to Hoffman (2001), feminism (in the singular) is a movement towards greater equality and freedom, to which particular feminists and feminisms contribute both positively and partially. He added that all feminisms are a critique of patriarchy or male domination. Feminists hold the view that women are discriminated because of their sex and their needs are unsatisfied and negated hence there is need for social, economic and political change (Delmar, 1986; Squire, 2017). This research recognises the discrimination against women and the need to redress gender inequality issues.

c) Climate change and variability

A number of studies have been undertaken that look at climate variability and change yet in many of these studies, climate variability is used interchangeably with climate change. It is thus important to differentiate these two concepts in this study so that it can be clear which particular concept is in use. According to the Intergovernmental Panel on Climate Change (IPCC) (2007), climate change refers to the build-up of greenhouse gases in the earth's atmosphere causing major changes in climate and catastrophic events. Gifford, Kormos, and McIntyre (2011) pointed that climate change is primarily driven by greenhouse gas-emitting human behaviours, such as the burning of fossil fuels, and therefore maybe largely mitigated by changes to those behaviours. On the other hand, Mubaya, Njuki, Mutsvangwa, Mugabe, and Nanja (2012) conceptualised climate change as longer term trends in mean climate variables of periods of decades or longer. This definition looks at the systematic deduction of how climate change is determined through calculations. These definitions play a role in understanding climate change debates, therefore it is important to integrate all the definitions and not use one in isolation as some elements which give a clear meaning to a study might be omitted.

Babugura (2006) argued that there are uncertainties about the projections of climate change hence it is complex to determine how much the climate will change as a result of greenhouse gas levels. On the contrary, Dube and Phiri (2013) in their study of south-western Zimbabwe linked the recurring droughts to climate change. It is however debatable if indeed climate change is causing the droughts yet climate variations are imminent and apparent. Although climate scientists believe that the impact of climate change is already apparent, it is difficult to tell whether the different disasters such as droughts, floods, hurricanes, and so forth are as a result of climate change or it is a natural occurrence that is not linked to climate change. Thus there is need to look at climate variability which is measurable and

present. In defining climate variability, Dinse (2011) and Nelson (2011) concurred that it refers to year-to-year fluctuations of climatic elements such as temperature and precipitation at several time scales.

d) Droughts

For this study, the researcher looked at droughts as a climatic variability element. There are various definitions of droughts and Wilhite (2000) conceptualised them as the consequence of a reduction in the amount of precipitation during an extended period of time, usually a season or more in length. Furthermore, Wilhite (2000) stated that drought is related to the timing and effectiveness of the rains: principal season of occurrence, delays in the start of the rainy season, occurrence of rains in relation to principal crop growth stages, rainfall intensity and number of rainfall events. In the same line of perspective, the National Weather Service (2008) also defined drought as a deficiency in precipitation over an extended period, usually a season or more, resulting in water shortage causing adverse impacts on vegetation, animals, and/or people. The National Drought Mitigation Center (2015) concurred with Wilhite (2000) that drought is a protracted period of deficient precipitation resulting in extensive damage to crops, resulting in loss of yield. In describing drought, Folger and Cody (2015) looked at the balance between precipitation and evapotranspiration, citing that the imbalance could result from a decrease in precipitation, an increase in evapotranspiration, or both. From the different definitions of a drought, it can be deduced that it is not only the reduction of precipitation that causes droughts. The timing and effectiveness of the rains compounded with social, economic, and political conditions can even aggravate the effects of drought.

e) Livelihoods

Chambers and Cornway (1992) and Serrat (2008) defined livelihoods as comprising of capabilities, assets (including both material and social

resources), and activities for a means of a living. In concurrence, Ellis (1999) defined a livelihood as the activities, the assets, and the access that jointly determine the living gained by an individual or household. Similarly, Huho, Ngaira, and Ogindo (2010) defined a livelihood as a means of living, especially of earning enough money to feed oneself. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base (Chambers & Cornway, 1992; Serrat, 2008). Scoones (2009) pointed that in analysing different definitions of livelihood, a complex web of activities and interactions that emphasises the diversity of ways people make a living is portrayed. For this study, attention was given to the assets, capabilities and activities that result in the communities earn a living.

f) Coping and Adaptation

There is a distinction between coping and adaptation. Vincent et al., (2011) defined coping as the short-term response that facilitates immediate survival, but does not reduce vulnerability in the long term. In the same vein, the Stockholm Environment Institute (2012) defined coping as a way of responding to an experienced impact with a shorter-term vision, for example, for a season. Similarly, Maxwell, Majid, Adan, Abdirahman, and Kim (2016:66) defined coping as "relatively short-term changes in behaviour to deal with a set back – with varying degrees of reversibility in the individual strategies employed." This concurs with a definition from Alemayehu and Bewket (2017), who defined coping as short-term responses to shocks. On the other hand, adaptation is defined by the Intergovernmental Panel on Climate Change (IPCC) (2001) as: "adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities." Furthermore, Leary (1999) and Burton, Huq, Lim, Pilifosova, and Schipper (2002) referred to climate adaptation as a wide range of behavioural adjustments that households and institutions make (including practices, processes,

legislation, regulations and incentives) to mandate or facilitate changes in socio-economic systems, aimed at reducing vulnerability to climatic variability and change. In addition, Nhemachena and Hassan (2007) conceptualized adaptation as a process of improving society's ability to cope with climatic conditions across time scales, from short term (e.g. seasonal to annual) to the long term (e.g. decades to centuries). The element of time scale is important in adaptation as communities need to move away from short term interventions to lasting and sustainable means of survival.

According to the IPCC (2007), there are various types of adaptation and these are: autonomous, or planned and reactive, or anticipatory. According to Malik, Qin, and Smith (2010), adaptation can be classified based on purposefulness (autonomous or planned), timing (anticipatory or reactive), temporal scope (long-term or short-term) and the implementing agent (public or private). In implementing these types of adaptation, they either complement each other or act as a substitute to one another (Fankhauser, Smith, & Tol, 1999). Anticipatory adaptation takes place before impacts of climate change are observed, and this is also referred to as proactive adaptation (IPCC, 2007). Autonomous adaptation, which is at times referred to as spontaneous adaptation is triggered by ecological changes in the natural systems and by market or welfare changes in human systems (IPCC, 2007). Forsyth and Evans (2013) concur with the IPCC that autonomous adaptation describes spontaneous acts of reducing risks posed by resource scarcity, and is driven by how environmental change and scarcity present livelihood risks, rather than physical risks alone. Planned adaptation is the result of a deliberate policy decision, based on an awareness that conditions have changed or are about to change and that action is required to return to, maintain, or achieve a desired state (IPCC, 2007).

As much as climate adaptation is ideal in moving the communities to a long-term solution to the effects of droughts, there are barriers that need to be tackled. Adger et al., (2009) categorised limits to adaptation as ecological and physical, economic and technological; and all these depend on societal ethics and attitudes to risks. In a Ghana study, Antwi-Agyei, Dougill, and Stringer (2015) found that households are constrained by financial barriers, socio-cultural barriers, institutional barriers, technological barriers and a lack of information on climate change characteristics. Similarly, Lonsdale, Kretser, Chetkiewicz, and Cross (2017) cited the following common barriers to adaptation: lack of resources, lack of information, lack of leadership, and competing priorities. These barriers could be turned into opportunities through creativity, learning, leadership and other varied approaches (Lonsdale et al., 2017). Vulnerability depends on the effectiveness and timing of adaptation and the distribution of capacity, which vary geographically, and between sectors (Romero-Lankao et al., 2014).

2.1.2. Global overview of climate change and variability

Climate change is a global security and human rights issue (Aguilar, 2009). There are no boundaries that hinder the occurrence of natural disasters yet the safety of humanity and their livelihoods need to be preserved. Regions prone and vulnerable to climatic disasters are discussed briefly in this section; these regions are Asia, Latin America, Australasia and Africa. There are significant similarities in how these four regions are affected by climate change, and what is common among the four regions is that they have plans to adapt yet the plans are not fully realised to make a difference in the short-term. On the other hand, Europe and North America have been included in the discussion for vulnerability to climate-induced disasters, although the magnitude of vulnerability is lower than the other four regions.

2.1.2.1. El Nino and La Nino effects on climate variations

The influence of El Niño–Southern Oscillation (ENSO) is dominant among all the continents that will be discussed in this section. The climate in Australasia, which includes Australia, New Zealand and surrounding islands

is strongly influenced by the surrounding oceans; and the El Nino-Southern Oscillation (ENSO) phenomenon, which causes floods and prolonged droughts is more pronounced in eastern Australia (IPCC, 1997). Climate variability in Asia is caused by El Niño–Southern Oscillation (ENSO), the Indian Ocean Dipole (IOD) and Pacific Decadal Oscillation (PDO) coupled with the monsoon with its strong seasonal cycle (World Bank, 2009). In South America, El Niños have been associated with drought conditions in northeast Brazil, Venezuela and Colombia, while prompting flooding along the west coast of the continent (Corporación Andina de Fomento, 2014). Similarly, Cook et al., (2016) argued that internal atmospheric variability, forcing from sea-surface temperatures, and land-atmosphere interactions are responsible for the recent historical droughts in North America.

According to Singh (2006), El Niño is the warming of sea-surface temperatures (SST) in the equatorial Pacific Ocean which influences atmospheric circulation, and consequently rainfall and temperature in specific areas around the world. On the other hand, La Niña is the cooling of sea-surface temperatures in the equatorial Pacific Ocean. The changes in the Pacific Ocean are represented by the term "El Niño/La Niña", while changes in the atmosphere are known as the "Southern Oscillation" however, these two cannot be separated, hence the term ENSO is often used (Singh, 2006). When the three-month running mean of the SST anomalies in the region are greater than or equal to 0.5°C, there is a good chance of an El Niño event taking place. When the anomalies are smaller than or equal to -0.5°C, there is a good chance of a La Niña event taking place. According to Dilley and Heyman (1995), ENSO events can be reliably predicted months, perhaps years, in advance. Thus regions can reduce the risk of ENSO effects if they plan appropriately.

2.1.2.2. The general overview of climate-induced disasters

In an analysis of 4,040 climate-related disasters between 1980 and 2002, Roberts (2009:196) found that “some poor nations had rates of death and

homelessness from climate disasters 200–300 times worse than the United States. They have far less capacity to deal with and recover from those disasters." From 1990 to 1998, poor countries accounted for 94% of the world's 569 major natural disasters and 97% of disaster-related deaths (Easterly, 2001). Looking at the geographical distribution of disasters, Asia was the continent most often hit by natural disasters in 2012 (40.7%), followed by the Americas (22.2%), Europe (18.3%), Africa (15.7%), and Oceania (3.1%) (Guha-Sapir, Hoyois, & Below, 2013). Economic losses depend on the geographical location, which has a bearing on the agricultural production and population density. Asia is considered to be one of the worst victims of climate change (Islam, 2013). In 2012, Asia was hit by fourteen disasters - eight floods, three typhoons, two droughts, and one food shortage scenario which affected more than one million victims each, accounting for a total of 72.7 million or 90.5% of all Asian victims in that year (Guha-Sapir et al., 2013:29). Asia is the largest continent on Earth and spreads over four climatic zones which are boreal, arid and semi-arid, tropical and temperate (United Nations Framework Convention on Climate Change (UNFCC, 2007). Salinger, Shrestha, Dong, McGregor, and Wang (2014) pointed that the geographic extent of Asia leads to great variation in the climate of the region. The region is highly prone to climatic extremes such as floods, droughts, heat or cold waves, and storms (World Bank, 2009).

2.1.2.3. Drought hazards – global focus

According to Carrão, Naumann, and Barbosa (2016), drought hazards are generally high for semi-arid areas, such as North-eastern and Southern South America; Northern, South-western and Horn of Africa; Central Asia; Australia; West United States, and the Iberian Peninsula. Steffen (2015) pointed that Australia is the driest inhabited continent on earth and Australians have always lived with drought and its consequences. The country has been deeply affected by drought throughout history, with the Federation Drought (1895–1903) being considered as one of the Australia's gravest natural disaster, which led to human deaths and damage to human

property (Garden, 2010). In addition, the World War II drought (1939–1945) ravaged the region with severe effects (Verdon-Kidd & Kiem, 2009). The Millennium Drought (2001-2009) severely hit the river ecosystems, irrigated and dry-land agriculture in Victoria and the Murray-Darling Basin, Australia's largest river system which contributed to the enforcement of water restrictions and increased electricity prices in major cities (van Dijk et al., 2013).

Droughts in Europe do not only affect the semi-arid areas such as the Mediterranean region, but have repeatedly affected Western and Central Europe, British Islands, Scandivania, Eastern Europe and Russia (Spinoni, Naumann, Vogt, & Barbosa, 2015). Blauhut, Stahl, Stagge, Tallaksen, De Stefano, and Vogt (2016) pointed that south-eastern Europe and northern Europe (Iceland, Norway, Finland) are under low drought risk in comparison to the other European regions, whereas parts of maritime Europe and western Mediterranean show increasing drought risk with hazardous conditions. According to Svoboda, Fuchs, Poulsen, and Nothwehr (2015), drought in the United States does not receive as much attention as other disasters because it is usually not associated with widespread structural damage or loss of life. Nevertheless, Cook, Seager, Cane, and Stahle (2007) reported that droughts are the most costly natural disasters to strike the United States. The climate-induced disasters in North America have increased stress on water, agriculture, economic activities, and rural and urban settlements (Romero-Lankao et al., 2014). In the same vein, the National Climatic Data Centre (2014) highlighted that over US$253 billion was lost in damages resulting from drought between 1980 and 2013, and over US$50 billion was lost in California and central/southern Great Plains between 2011 and 2014.

2.1.2.4. Insurance protection considerations

Kahn (2005) purported that developing nations tend to have large populations with low incomes, thus experience natural disasters that are

exacerbated by global climate change more intensely (Roberts, 2009). In contrast, Burke and Lobell (2010) highlighted that in wealthier countries, farmers rarely go hungry as a result of drought or other adverse climate events due to the existence of social safety nets and functioning financial markets which provide insurance or credit in order to maintain livelihoods during bad times. Droughts, combined with poor governance and poorly functioning market systems, oppressive policies, and intermittent or insufficient food aid; have led to food insecurity, famine, human conflicts, and widespread mortality (Below, Grover-Kopec, & Dilley, 2007; Gráda, 2007).

On another note, Barrett et al., (2008) argued that cases whereby climate shocks cause simultaneous losses across farmers in a region thereby exceeding the reserves of the insurer is a primary explanation for why insurance is unavailable in many poor regions. Similarly, Ngigi (2009) reiterated that risks in Africa are too high and recurrent; it is economically unattractive to commercialize such products as crop insurance. In countries such as Zimbabwe, that are hit hard with economic woes, it is unrealistic to even consider insurance for small-holder farmers who are battling to make ends meet and surviving on food assistance if it is accessible and available. Carrão et al, (2016) suggested that in order to reduce drought risk on an economy, there is need to diversify regional economies on different sectors of activity and reduce the dependence of their GDP on agriculture.

Yusuf and Francisco (2009) noted that transfers from rich to poor countries not only require a common and shared vision among the countries, but also involve long and complex political processes. In the same vein, Bhattacharyya and Werz (2012) highlighted that Hurricane Sandy, a record breaking year of drought, heat waves, and extreme weather proved that potential impacts of climate change are not problems of distant shores; they are a globally shared burden. However, no country is willing to bear the economic bulk of disasters in other countries if such economic contributions

have little or no returns or benefits, thus it would be more constructive if countries were involved in the study and exchange of technical disaster prevention and mitigation strategies and expertise (Islam & Lim, 2015). Nonetheless, following the declaration of catastrophic disasters such as droughts, huge aid contributions are poured into countries, with the latest El Nino response attracting humanitarian assistance attention. This shows how aid agencies are unified to save lives without criticising how the aid comes with conditions.

2.1.2.5. Adaptation strategies across continents

Stein et al., (2016) reported that European Union has moved from a crisis-oriented approach of managing disasters to a preventative approach, which has seen the increase in disaster response and recovery policies, disaster prevention, mitigation and preparedness approaches being developed. The European Environment Agency (EEA) (2017) indicated that although climate change impact has adverse effects, there have been some benefits, particularly in the reduction of heating demand and some benefits to agriculture in Northern Europe. Eriyagama, Smakhtin, and Gamage (2009) noted that infrastructural development of a country such as availability of improved drinking water and general accessibility of rural areas through the road network among other factors; determines the level of its drought preparedness. European countries such as UK, Spain, France and the Netherlands are reportedly having higher infrastructural development, which contributes to their effective responsiveness to the effects of drought. Similarly in Asia, Bhattacharyya and Werz (2012) proposed ecological infrastructure development that mitigates the consequences of flooding, water salinization, and erosion.

Despite the adaptation strategies being implemented across the Latin America region, Kronik and Verner (2010) found that the kind, frequency, intensity, and unpredictability of the effects of climate change and variability

leave indigenous communities with a sense of frustration, and in some cases even resignation and acceptance, with little knowledge about how to act or who can help. Eakin (2005) found that the main adaptation strategies employed by the farmers in Latin America in response to droughts include: switch to cultivars with higher yields, irrigation, and non-farm employment and migration. Similarly, Mendelsohn and Dinar (2009) highlighted that there is evidence of a transition from crop farming to stock-raising or a mixture of the two, with irrigation decisions modified accordingly. In addition, United Nations (2015) noted that Latin America is shifting from growing maize, wheat, and potatoes to cultivating fruit and vegetables. Latin America has focused on the hard adaptation measures due to the high costs and the measures are mainly providing protection for coastal zones, agricultural activities, and water resources (United Nations, 2015). However, Kronik and Verner (2010) pointed that these strategies apart from immigration and non-farm employment are too expensive for farmers as they depend on subsidies, access to water, and funds for investment.

In reducing the vulnerability to droughts, Asia is focusing on the development of new high yielding drought resistant varieties, improvement of crop management and cultural practices, development of capacity for better adaptation like development of early warning system, development of maps showing rice growing areas prone to drought, development of irrigation facilities for low lying areas, increasing planting index in suitable areas, and diversification of food (Miyan, 2015). The whole Asia region faces challenges in implementation of adaptation strategies due to weak governance issues and adaptation processes (USAID, 2010). Weak governance issues relate to the poor structuring, coordination, financing of sub-national governments, inadequate provisions for civil society engagement, and laws, policies and regulations that are ineffective in addressing non-climate stressors and concerns.

On the other hand, Pittock and Wratt (2001) echoed that adaptation to climate change as a means of maximizing gains and minimizing losses is important for Australia and New Zealand, but is relatively less explored. They cited that landscape management as an integrated approach could achieve conservation goals and human needs for food and fibre. Similarly, the Commonwealth of Australia (2008) suggested that there should be changes to building design in order to improve the resilience of buildings in the latter part of the century as stock is renewed or replaced. Farms are often diversified with portfolios of on-farm enterprises and off-farm investments (Martin, King, Puangsumalee, Tulloh, & Treadwell, 2005) and this diversification has often enabled businesses to cope with variation in climate and to capitalize on changes in the relative prices of agricultural commodities (Kingwell & Pannell, 2005). However, Kingwell (2006) pointed out that opportunities for spatial diversification may be much more limited for much smaller businesses hence restricting them to on-farm and local responses to climate change and variability.

Despite the understanding of the adverse effects of climate change in North America, Lonsdale et al., (2017) noted that there is little implementation of adaptation strategies on a broader scale. Romero-Lankao et al., (2014) reiterated that planners are facing significant challenges and resistance at both the planning and implementation stage of adaptation. However, many decision makers, particularly in the USA and Canada, have the financial, human, and institutional capacity to invest in resilience despite the evidence of losses across the continent (Romero-Lankao et al., 2014). Proactive drought planning remains a challenge in USA despite the multiple generations of experience with ecological, economic, and social effects from previous droughts (Kelley, Scasta, & Derner, 2016).

Eriyagama et al., (2009) reported that North and South America, Australia and Europe display much lower socio-economic drought vulnerability because the percentage of employment in agriculture is very low. Similarly,

Carrão et al., (2016) indicated that the wealthiest regions of the world such as Western Europe, North America and Oceania are less vulnerable to droughts. Although North America does not exhibit the levels of vulnerability to climate-induced disasters that other continents experience, isolation is not an option as the world is interconnected. Paradoxically, Canada has abundant water resources yet there is an uneven distribution and demand for these resources, resulting in varied vulnerability to, and impacts from, drought (Yusa, Berry, Cheng, Ogden, Bonsal, Stewart, and Waldick, 2015).

Stein, Özerol, Tröltzch, Landgrebe, Szendrenyi, and Vidaurre (2016) reiterated that due to climate change, there will be increased water shortages, with most severe impacts experienced in southern and south-eastern regions of Europe. The dependence of Europe to cross-border economic trade increases its vulnerability to climate-related global price volatilities and disruptions to transportation networks (EEA, 2017). Ercin, Chico, and Chapagain (2016) concurred with the EEA in that Europe's economic dependence beyond its borders makes it vulnerable to droughts as there is water scarcity in many parts of the world. Of the 668km^3 water that Europe utilises annually, 38% comes from outside its borders and their imported supply of food comes from countries that are experiencing severe water depletion (Ercin et al., 2016). Moreover, droughts affect all continents and as reported by National Climatic Data Centre (2014), major financial losses have been incurred in USA, which exposes the gravity of droughts.

2.1.2.6. Global conferences on climate change and outcomes

There have been a number of global conferences (COPs) since 1995 to attempt to coerce countries with huge corporations to lower carbon emissions and utilisation of fossil fuels with little or no success. Boyd (2013) pointed that actions by some countries to reduce carbon emissions may easily be cancelled by inaction of other countries. Therefore there is need for global governance that pursues a coalition of major countries that have worked together well in addressing climate change issues to start regulating

carbon emissions; and introduce sanctions and incentives (Boyd, 2013). The series of annual conferences have not generated any recent binding agreements on emissions reductions (Bracking, 2014). Furthermore, Bond (2015) pointed that each national delegation comes to each Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) with the agenda of maximizing the interests of its own corporations, which tend to prominently include those with industrial or fossil fuel assets.

Similarly, Wonmin (2015:2) reiterated that the conferences have failed to address climate crisis at its roots such as “fossil based energy production, car based private transport and ubiquitous air travel, sprawling urbanisation, the liberalised global trade regime, industrialised agriculture, and overconsumption in the Global North (including parts of the geographical South)”. Thus, any attempt to mitigate the climatic risks needs to be a deliberate effort globally in changing the status quo. This calls for countries that are able to participate cooperatively in one accord, that are accountable to each other, and are able to make unified decisions to mitigate climate risks. Satgar (2018) linked the failure to act against climate crisis to the unbalanced political and negotiating power between climate denialists in the Global North and the vulnerable peoples of the Global South. Moreover, he argued that there is no acceptance in the Global North that the capitalist economic model leads to plunder, waste and pollution.

Whatever change that transpires at household and community level trickles down at the region level thereby transforming the global landscape. The capacities of different regions contribute to how they respond to the disasters such as those emanating from climate change and variability. However, with the existing different views on the magnitude and likely consequences of climate change among the regions, the global conferences become habitual with no tangible results yet it is the poor nations that continue to suffer the consequences. Even though there is

interdependence among continents, with some weaker than the others, until the global leaders consider climate change and variability as a human rights issue, lives and livelihoods will remain under threat. Climate change is not sparing any region hence a united approach to this global challenge is important and learning from different regions assists in identifying what is appropriate and effective in another region. In the next section, the focus is on the observed climatic changes and variability in Africa.

2.1.3. Africa – observed changes and variability in climate

The African climate is determined on the macro-level by three major global drivers which are the Inter Tropical Convergence Zone, the El Nino–Southern Oscillation (ENSO), and the West African Monsoon (Collier, Conway, & Venables, 2008). The variability of rainfall in eastern and southern African regions is concentrated on relatively short time scales in a year and it has a direct connection with global processes such as El Niño/La Niña-Southern Oscillation (ENSO) (Nicholson, 2001). ENSO events have a strong influence on the inter-tropical convergence zone (ITCZ), regional monsoon wind circulation, and patterns of rainfall anomalies over many parts of sub-Saharan Africa (Singh, 2006). Mubaya et al., (2012) asserted that Africa will experience heightened frequency and intensity of extreme weather. In addition, Shewmake (2008) highlighted that climate change is expected to increase the frequency of climate-related shocks, such as floods and droughts in Sub-Saharan Africa. Despite the little contribution to the global warming problem, poor countries suffer the most as they have the least capacity to adapt to its effects (Dube, Moyo, Ncube, & Nyathi, 2016).

Although Africa is one of the most vulnerable continents to climate variability and change due to an interaction of multiple stressors (Boko et al., 2007); there are regional differences in the depth of vulnerability and impacts. The IPCC (2007) identified a number of development challenges that contribute to the vulnerability of Africa such as poverty; limited institutional capacity; limited access to markets, capital, infrastructure and technology; ecosystem

degradation; low levels of resilience to disaster and resource-based conflicts. Similarly, Eriksen, O'Brien, and Rosentrater (2008) pointed out financial, institutional, and technological capacity as the major drivers of the vulnerability of Africa to climate change.

In addition, the African Ministerial Conference on Environment (AMCEN) (2011) pointed that climate change is likely to be more serious in Africa than anywhere else because of its large rural population that depends on rain-fed agriculture for food, its natural resource-based economy, and constraints on internal trade. Agriculture contributes about 42% of sub-Saharan Africa's GDP in the low-income countries and supports the livelihoods of approximately 65-80% of the labour force (International Fund for Agricultural Development, 2003). The dependence on agriculture in itself is not a challenge but the combination of factors listed such as low institutional capacity, lack of or limited technology, and lack of capital hinder the small-holder farmers who are in the majority from adapting to the changes in climate. On the other hand, Joiner, Kennedo, and Sampson (2012) cited that a history of ethnic conflict may render some places in Africa more vulnerable to climate change than others. Moreover, poverty and environmental degradation renders Africa more vulnerable than other continents. Although 2012 statistics show Africa having a 15.7% record of natural disasters, the plethora of development challenges mentioned above exacerbates its vulnerability.

According to the United Nations Environment Programme (UNEP) (2002), the Sahel experienced a decrease in rainfall from 1970 to 2000, coupled with recurrent droughts that started from late 1990s. Similarly, the Horn of Africa and Southern Africa have been attracting attention due to the severe droughts that ravaged the agricultural production between 2011 and 2016. Moreover, Boko et al., (2007) highlighted that there has been an increase in temperatures over the Sahel, tropical forests, Southern Africa, Eastern Africa and Northern Africa. Collins (2011) concurred with Boko et al., (2007)

that there have been temperature increases in all African regions between 1995 and 2015. On the other hand, the AMCEN (2011) indicated that there was an increased frequency of rain accompanied by floods in places such as Mozambique, Nigeria, Guinea coast and some parts of Southern Africa. Nevertheless, the African Union drafted the Climate Change strategy which will last up to 2035 although this is still to be implemented against the backdrop of low adaptive capacity and climate finance challenges. The UNFCC (2007) reported that a third of Africa's population already lives in drought-prone areas and 220 million are exposed to drought yearly. The Overseas Development Institute and Climate and Development Knowledge Network (2014) indicated that many Africans depend on food, fibre, and income from primary sectors such as agriculture and fisheries sectors, which are affected by rising temperatures, rising sea levels, and erratic rainfall.

Looking at West Africa, Joiner et al., (2012) pointed that the highest concentration of vulnerability to climate change is located along the coast in areas with high ethnic and religious diversity. These areas include Nigeria's Niger Delta, Liberia, Sierra Leone, and Guinea-Bissau. Zickgraf, Vigil, de Longueville, Ozer, and Gemenne (2016) further cited the hotspots of severe natural disasters and climate change as mainly located in the central part of the Sahel, Niger, Burkina Faso, northern and coastal Ghana, as well as in northern Togo, Benin, and Nigeria and often straddle international borders. The West African populations depend on climate-sensitive activities such as agriculture, herding, and fishing, which when coupled with a rise in sea levels and deforestation, contributes to their vulnerability to climate change (Joiner et al., 2012). The IPCC (2014) highlighted that West Africa faces many manifestations of climate change - sea level rise, soil salinization, floods, drought, desertification, intensifying winds, and heat waves. Sea level rise would increase erosion, change soil composition, and decrease agricultural yields in the region (Joiner et al., 2012). Farmers in the Volta Basin reported that they were experiencing delays in the onset of rains

which has resulted in them sowing crops 10 to 20 days later than their parents (van de Giesen, Liebe, & Jung, 2010). It was however cautioned that there has to be an understanding of the definition of onset, and acknowledgement that some crop varieties grow faster such that one has to consider the soils, crops and varieties (van de Giesen, Liebe, & Jung, 2010). The interpretation of onset of rains has to be contextualised in order to derive an accurate description of a situation.

In Africa, rural farmers have been incorporating a number of strategies in response to the climatic events. These include intercropping and crop diversification; use of home gardens, diversification of herds and incomes such as the introduction of sheep in place of goats in the Bara province in Western Sudan (UNFCC, 2007). According to Padgham (2015), the deployment of shorter-duration crop varieties has become prominent in several areas of Burkina Faso, Mali, Ghana, and Senegal. In addition, UNFCC (1997) identified pruning and fertilizing to double tree densities to prevent soil erosion in semi-arid areas, e.g. Senegal, Burkina Faso, Madagascar, and Zimbabwe. On the other hand, there has been manipulation of land use leading to land use conversion, e.g. a shift from livestock farming to game farming in Southern Africa. According to Padgham (2015), small reservoirs are an important risk management strategy widely deployed in West Africa for household and livestock water needs; including irrigation. Although there are practices of conservation adaptations in West Africa, there are cases in Burkina Faso, northern Ghana, and Mali where land tenure security creates a strong disincentive for investment in land improvements and undermines the ability to use land resources to manage shocks (Padgham, 2015).

Sarr (2012) highlighted that improved field water management can also be achieved through the adoption of soil and water conservation techniques such as mulch, grass strips, earthen bunds, half moon, stone lines, Zaï, and also reduce excessive surface runoff and soil erosion. The UNFCC (2007)

reported that farmers in Burkina Faso have been using water conservation techniques to cope with arid conditions such as the Zaï technique. The technique is applied through digging pits “in the soil to collect organic material carried by the wind during the dry season, at the start of the rainy season farmers add organic matter from animals which attracts termite activity resulting in termite tunnels that can collect rain deep enough that it doesn’t evaporate, and thus increasing soil fertility.” Adoption of drought-tolerant crops such as sorghum, staggered sowing, and utilisation of hand-dug wells for irrigation during droughts have been practised in the Sahel region (Joshua et al., 2016).

There have been challenges to adaptation in Africa such as lack of climate data and information which creates difficulties in assessing the overall risks and vulnerabilities triggered by climatic and non-climatic factors (Overseas Development Institute and Climate and Development Knowledge Network (ODI and CDKN), 2014). The ODI and CDKN (2014) pointed out that the confinement of development planning to a national level tends to disregard or undermine cultural, traditional, and context-specific practices that support local adaptation to climate change. Kangalawe and Lyimo (2013) observed the implementation of adaptation strategies in Tanzanian communities, however they pointed that this was ad hoc with limited planning. Factors that negatively affect the continent to cope with climate variability include: poverty, illiteracy and lack of skills, weak institutions, limited infrastructure, lack of technology and information, low levels of primary education and health care, poor access to resources, low management capabilities, and armed conflicts (UNFCC, 2007). Joiner et al., (2012) and Dube et al., (2016) alluded that the geography, dependence on rain-fed agriculture, and the fragile social and political infrastructure of many of the continent’s countries are contributing to the challenges of coping with climate change. Despite the little contribution to the global warming problem, poor countries suffer the most as they have the least capacity to adapt to its effects (Dube et al., 2016).

In the next section, the effects of climate change and variability on human sustainability are discussed to give a perspective of the projected risks that are likely to emanate.

2.1.4. Effects of climate change and variability on human sustainability

The impacts of climate variability are both ex post and ex ante (Hansen, Dilley, Goddard, Ebrahimian, & Ericksen, 2004). While ex post impacts refer to the losses that follow a climate shock, ex ante impacts refer to the opportunity costs associated with conservative strategies that risk-averse decision makers employ in advance to protect themselves from the possibility of climate shocks (Hansen et al., 2004). Dankelman et al., (2008) highlighted the following problems that climate change poses; increased frequency of weather events, flooding, storms, drought, desertification, increases in sea temperatures, heat and cold waves, and the melting of glaciers and permafrost. These problems will be different from one region to another and will have different impacts on different people. Due to these problems, there will be significant ecological, social, and economic effects, additionally; these effects will affect human sustainability. This section focuses on biodiversity and ecology; water and sanitation; health; agriculture; and rural livelihoods. These effects pose vulnerabilities to human development and precisely, there are a threat to the most vulnerable people who are poor and are prone to shocks and stresses.

2.1.4.1. Biodiversity and ecology

Biodiversity is important for the indigenous people who live on the margins of fragile and changing ecological, economic, and political systems as it buffers against variation, change and catastrophe (Salick & Byg, 2007). However, according to Thullier (2007), biodiversity ecologists have estimated that 15-37% of natural species may be extinct by 2050 as a result of climate change and habitat change. The UNDP (2009) shows that certain

species are more vulnerable to climate change than others, for example, about 60% of mountain plant species will become extinct if the present levels of greenhouse gases are maintained. There is an interdependence in the ecosystem hence all these changes have an impact on human development. Natural adaptation will be impossible to attain and the resilience of socio-economic systems will be tested (UNDP, 2009).

Agricultural ecosystems and food security are vulnerable to climate change as they depend on nature. Ninety percent of human food is provided by only 15 species of plants and eight species of animals (Chen, 1990). If these plants and animals become extinct or reduced in production, human beings will face hunger as they rely heavily on these species. Scientists predicted that one-quarter of wild potato species will disappear in the next 50 years (UNDP, 2009; Melnychuk, 2013). In the same vein, Dube et al., (2016) stated that due to the change in climate patterns, particular species of plants and living organisms will either adapt or die. Moreover, those that fail to adapt will become extinct, resulting in ecological destabilisation and an alteration or destruction of community livelihoods. The above statistics show how much changes in climate are likely to threaten biodiversity and ecology hence the need to act swiftly for a sustained future.

2.1.4.2. Water and sanitation

Boko et al., (2007) noted that climate change and variability have the potential to impose pressures on water availability, water accessibility, and water demand in Africa. According to the AMCEN (2014), over half of Africa's population resides in regions with absolute water scarcity and the number was expected to increase to over 800 million by 2015. Higher water temperatures, increased precipitation intensity, and longer periods of low flows are projected to exacerbate many forms of water pollution, including sediments, nutrients, dissolved organic carbon, pathogens, pesticides, salt and thermal pollution (IPCC, 2007). Since the quality of water will be

compromised, this in turn will affect the health of people, ecosystems, and the operating cost of water systems.

According to Ngaira (2007), agricultural activities are controlled by rainfall amounts and distributions and most of the cash crop cultivation needs over 1000mm of rainfall well distributed over the growing season. Comparing the 1000mm of rainfall needed for agricultural activities and the average 650mm that Mudzi district receives, it can be deduced that Mudzi district has lower rainfall than actually needed. Tadesse (2010) concurs that agriculture is rain-fed and is therefore sensitive to severe and prolonged droughts, flooding, and loss of arable land due to soil erosion and desertification. By 2009, there was 20-30% decrease in water availability in vulnerable areas with a low-warming scenario; however, in high-warming scenario areas such as Southern Africa, there was a 30-50% decline in water availability (Tadesse, 2010). Due to climate variability and change, droughts and floods will be frequent hence affecting water resources.

2.1.4.3. Health

Increases in temperature, climate change-induced natural disasters, and scarcity of safe drinking water due to droughts are major contributors to the spread of infectious and water-borne communicable diseases in Africa (Besaba & Sewankambo, 2009). According to the World Health Organisation (WHO) (2005), climate change can affect human health directly (e.g. impacts on thermal stress, death or injury in floods and storms); and indirectly through changes in the ranges of disease vectors (e.g. mosquitoes), water-borne pathogens, water quality, air quality, and food availability and quality. The WHO (2005) further pointed the causes of health risks to climate, which are: direct stresses (e.g. heat waves, weather disasters, workplace dehydration); ecological disturbances (e.g. altered infectious disease patterns); disruptions of ecosystems on which humanity depends (e.g. health consequences of reduced food yields); and population displacement and conflict over depleted resources (e.g. water, fertile land,

fisheries). In addition, Besaba and Sewankambo (2009) emphasised that climate change also has indirect effects on health in the region through ecosystems degradation and unsafe water and poor sanitation, which contribute to malnutrition, cholera and diarrheal diseases, and increase in child mortality.

It is important to note that there are various factors that link climate change to poor health and these include: changes in mean and extreme temperatures; extreme rainfall events – drought and floods; air pollution; and vector and rodent borne diseases (Midgely et al., 2007). Patz, Campbell-Lendrum, Holloway, and Fole (2005) indicated that exposure to both extreme hot and cold weather is associated with increased morbidity and mortality. According to Ebi and Bowen (2015), some health effects of drought include "inadequate nutrition (including under-nutrition, micronutrient deficiencies, and mortality), food- and water-borne diseases, air-borne and dust-related diseases, vector-borne infectious diseases, illnesses related to exposure to toxins, mental health effects (including distress and other emotional consequences), and other health effects (including wildfire, effects of migration, and damage to infrastructure)." Therefore climate change and variability negatively impact health.

2.1.4.4. Agriculture

Climate variability affects food security through its broader influence on investment, adoption of agricultural technology, aggregate food production, market prices and economic development, hence the ability of individuals, communities, and nations to produce and purchase food (Hansen, Dilley, Goddard, Ebrahimian, & Ericksen, 2004). Similarly, "drought can directly affect food availability and stability through impacts on production, can affect food access, and can affect food utilisation indirectly by affecting water quality and quantity" (Ebi & Bowen, 2015:99). A study by the International Food Policy Institute (IFPRI) indicates that rice production in South Asia could decline by 23%, maize production by 36%, and wheat production by

57% relative to 2000 levels by 2050 due to climate variability (Nelson et al., 2009). On the other hand, yields in sub-Saharan Africa could decline by 20% to 40%. Barker (2011) noted that the poorest regions of the globe will experience the highest degrees of food instability. The world experienced high food prices between 2005 and 2008 whereby world prices of rice, wheat and maize doubled, pushing 100 million people into poverty (Tadesse, 2010). The trend of high food prices is likely to continue if the agricultural yields remain low. With the culmination of severe and prolonged droughts and flooding, agriculture will be the worst hit. The pastoralists in the Horn of Africa (Ethiopia, Kenya and Somali border) have been experiencing recurrent droughts thereby triggering mass migration out of the drought-affected areas (Tadesse, 2010).

Benhin (2006) indicated that there might be gains and losses in agricultural productivity depending on the region and farming methods utilised. Agriculture depends on temperature and moisture conditions being near-optimal during the growing season therefore extreme temperatures and precipitation pose adverse effects to agricultural production (Midgely et al., 2007). Nelson et al., (2009) indicated that climate change will alter the planting dates in some locations, shifting the month in which a crop can be safely planted backward or forward. USAID (2010) pointed that high temperatures, changes in precipitation patterns (including flooding and drought), glacial melt, extreme events, and a rise in sea level are likely to impact agriculture in Asia region. These changes will alter cropping and grazing areas and seasons, the spread of pests and diseases, irrigation requirements, and the need for drought, flood, and saline-resistant crops (USAID, 2010). Mudzi district already faces changes in planting dates; however, there is no guarantee that there will be adjustments to the rainy season to accommodate the different development stages of the plants. On the other hand, Hassan (2010) noted though that agricultural losses in drier African regions will be compensated for by increased production in high latitude regions where global warming will raise temperatures and extend

planting seasons by reducing the risk of frost in many places. As a result of climate change, severe pest breakouts, extreme weather conditions, and water scarcity threaten input costs and market prices for agricultural commodities (Sattar, Wang, Tahir, & Caldwell, 2017). However, Gliessman (2014) expressed his concern on how innovation in agriculture had been driven mainly by an emphasis on high yields and visionless, short-term farm profit at the expense of negative environmental and social side effects. This is in concurrence with the emerging notion that agriculture is a culprit in worsening climate change. According to the OECD (2015), although climate change is exacerbating the challenges faced by the agricultural sector, agriculture is also contributing a significant share of the greenhouse gas emissions that are causing climate change. The main sources of the gases include nitrogen fertilisers, improper soil management, land conversion, biomass burning, livestock production and associated manure management (Grasty, 1999; FAO, 2008; Goodland & Anhang, 2014).

Despite women's agricultural work producing 35-45% GDP in developing countries, women are side-lined in the decision-making processes that influence agricultural productivity (Ibrahim, 2009). It is debatable though if women are really side-lined in decision-making, it may vary from one region to another hence it was important to understand the dynamics that shape decision-making in Mudzi district. Barker (2011) found that women play a central role in agriculture and are on the front line experiencing climate change related impacts on natural resources. In the same vein, Sasvari (2010) pointed out that the agricultural sector and food security are highly exposed to climate change; therefore it is crucial that rural women are empowered to enable them to cope with the disasters.

2.1.4.5. Rural livelihoods

According to Simatele, Binns, and Simatele (2012) in Zambia, the livelihoods of the poor are likely to deteriorate because of climate change. Midgely et al., (2007) stated that the impact of climate variability on assets

links directly to the productivity of livelihood activities. Production and income activities are likely to be significantly affected by climate variability, particularly in rural areas where changes in rainfall directly affect agriculture and natural resources that underpin many production and income activities (Midgely et al., 2007). UNDP (2009) echoed that more frequent and longer-lasting droughts will affect people and adversely affect the livelihoods of people who rely on agriculture for survival. In concurrence, Ahmed, Hassan, Etzold, and Neelormi (2012) reiterated that since rainfall plays a significant role for the livelihoods of the poor, climate change disturbs the seasonal production cycle of the poor and threaten their livelihood security.

There is growing evidence on how changes in rainfall impact livelihoods, often increasing the vulnerability of farming systems (Babugura, 2010). Assets and activities are likely to be impacted negatively as a result of climate change. Ensuring that the livelihoods of the most vulnerable people are protected is imperative therefore there is need to build resilience in response to climate change threats. Understanding the different livelihoods in different contexts is also essential as this would determine the responses needed to address the challenges faced.

2.1.5. Gender, climate change, climate variability and vulnerabilities

Climate issues, whether negative or positive have an impact on gender relations. Aguilar (2008) asserted that the existing inequalities between men and women will be magnified due to climate change. In addition, Madzwamuse (2010) pointed that there is a gender dimension to poverty and vulnerability to climate change. Furthermore, Singh, Svensson, and Kalyanpur (2010) noted that climate change is not gender neutral and the most vulnerable and least empowered populations will be adversely affected. Vulnerabilities differ within countries, communities and households (CARE, 2011). It is important to understand gender relations in the context of a particular climate element as different challenges arise when faced with

droughts or floods. The background of climate change is important as it gives a perspective of what the future is likely to be. However, given that climate change is futuristic although the effects are already said to be felt presently, it is important to flag the concept of climate variability for this study, which is measurable currently.

The inequalities that exist between women and men are socially constructed and are perpetuated by cultural, social, political and religious norms. Otzelberger (2011) pointed out that taking a gender-responsive approach is about understanding socially constructed roles and opportunities associated with being a man or a woman and the interactions thereof. In addition, Otzelberger (2011) and Vincent et al., (2011) concurred that gender often creates unequal social relations between men and women, with women constrained to an unequal position in society compared to men. This is however debatable given the African perspective on gender issues by Chauraya (2012) who claimed that gender segregation is tolerated and divinely ordained hence the need to understand the context.

Even though Chauraya (2012) claimed that gender segregation is tolerated and divinely ordained in Africa, this does not apply to the whole continent or even within the same countries or regions as issues of inclusiveness, equity and participation of women are lobbied for in different countries such as Zimbabwe. The National Gender policy of Zimbabwe is based on the principles of inclusiveness and equity. Although the policy acknowledged that Zimbabwe had not developed any framework that comprehensively addresses gender inequalities in environmental conservation and climate change adaptation and mitigation, there was room to influence the Climate Change National Response Strategy that was being drafted. Moreover, there is a call for women's equal participation in sustainable utilisation of natural resources for economic benefits and any climatic negotiation processes at local, national and global levels.

United Nations Womenwatch (2009) observed that men and women face their social, economic and environmental reality in different ways. This is affirmed by the study carried out by London School of Economics on disasters in 141 countries where gender differences in deaths from natural disasters are directly linked to women's economic and social rights (Neumayer & Plumper, 2007). Where women lack basic rights, more will die from natural disasters than men; where they enjoy equal rights, the death rate is the same. This is shown in the Bangladesh study on flood and cyclone disasters in 1991 that revealed that among women aged 20-44; the death rate was 71 per 1000, compared to 15 per 1000 for men (UNEP, 2005). The notion that unequal basic rights exclusively contribute to gender disparities on deaths can be contested as there are other factors that need to be accounted for. Nonetheless, the underlying reality is that men and women face their vulnerability differently hence there is need to understand their context in explaining the socio-economic challenges that droughts bring to a different group such as women.

It is important though to define who and where the poor women are. An umbrella approach of issues cannot give a correct analysis of a situation as there are levels of poverty even within poor communities. Hence there is need to understand the depth of issues within a context and analyse why there is limited mobility and restricted rights. Aguilar (2009) pointed out that the wellbeing of women is worse affected compared to their male counterparts when confronted with climate change. It affects their livelihood opportunities, the time they have available to them on a daily basis, and overall expectancy. It can be argued that not all women experience inequalities therefore there is need to understand women in a particular context. The CARE (2011) argued that not all women are vulnerable as some have knowledge and capacities to protect their families against climate change hence there is need to understand the dynamics of vulnerability. Similarly, Arora-Jonsson (2011) stated that women can be rich

or poor, urban or rural, come from different ethnicities, nationalities, households and families; all of which produce specific results.

Climate change poses different vulnerabilities among women and men due to the inequalities that already exist in power relations, access to resources, role, and the position of women (Dankelman et al., 2008). Moreover, poor women's limited access to resources, restricted rights, limited mobility, and muted voice in shaping decisions make them highly vulnerable to climate change (UNDP, 2009). Most women in the rural areas depend on natural resources for their livelihoods. It is estimated that in developing countries, women grow 80% of food and climate change has a direct bearing on their livelihoods. They provide most of their household food and sustenance and also work as the primary caregivers (Barker, 2011). Thus changes in weather patterns and extreme weather events will affect traditional growing and harvesting cycles; resulting in women's inability to provide for the subsistence needs of their families (Babugura, 2010).

According to the UNDP (2009), women are more vulnerable than men because they are excluded socially, for instance, culture limits them to mobilise outside their immediate environment; they have less access to information on early warning systems in times of disasters, and to forecasts of climate variability; and have difficulties in participating in training purposes. Hence the factors that cause their inequalities affect their response to the impact of climate change. In Mudzi district, the stakeholders reported that they were training women in climate smart agriculture and there were no limitations on their participation. All the training programmes had a minimum of 60% women attendees thus promoting the inclusion of women in benefitting from the training programmes. It can be argued that women are not always side-lined in community development; rather there is an intentional move by different stakeholders to create opportunities for them to be included in development.

Caretta (2014) pointed out that in rural Kenya, women's lack of access to land and credit combined with a high dependence on rain fed agriculture is strongly associated with vulnerability to climate-induced disasters. On the other hand, the pastoralist women in Kenya lack resources, access to information, and have little decision-making power which contributes to their vulnerability (Few et al., 2015). Women in the Latin America region face huge challenges as they are often traditionally responsible for routine labour in horticulture; while men clear the forests, which demands heavy labour, but is less time consuming (Kronik & Verner, 2010). In Zimbabwe, women in some areas of Shurugwi reported a shift in livelihood strategies to beer brewing, which led to higher alcoholism and an increase in domestic violence and abuse against women (Brown et al., 2012).

Women have numerous roles and responsibilities in the family; primary caregiving for children, the elderly, and the broader community; food producing and providing; standing in as guardians of health and economic actors (Dankelman et al., 2008). Most of the unpaid reproductive labour performed by women in the household is done in their capacity as family members and it is considered as labour of love (Fakier & Cock, 2009). Valodia (2000) pointed that women are overrepresented in the secondary labour market in which they tend to occupy the most vulnerable and least lucrative strata, termed "survivalist" activities. These roles make them susceptible to being affected by sudden changes that occur as they are at the forefront in running households. During drought periods, women are forced to travel long distances to fetch water, collect wild food, and generate additional income sources (Few et al., 2015). Kronik and Verner (2010) emphasised that work in open fields under rising temperatures, crop failure and replanting, and lower crop yields affect women's health and psychological well-being. This is also exacerbated by their social and economic status as many households are female headed and subjected to poor living conditions especially in rural areas. Hence when disaster strikes,

women lose their livelihoods and are pushed to the extreme periphery of poverty as they face marginalisation and inequalities.

Babugura (2010) stated that linking gender to climate change is imperative for the development of effective climate change policies that are gender responsive. If women are given power to make decisions and a voice to raise their concerns in handling climate change, communities become more resilient as women are placed on the forefront in development. Although it can be argued that their participation is subtle, research has shown that women are at the centre stage of any development. Their input is mostly unrecognised and not considered as major yet they play a vital role in production, reproduction and community management. Few studies that have been undertaken in Zimbabwe do not disaggregate female-male data hence it is difficult to conclusively state that women are vulnerable to climate change. Singh, Svensson, and Kalyanpur (2010) stated that it is difficult to establish a full set of causes and potential effects of climate change without a gender-sensitive method of analysis. Therefore it is important to disaggregate data and establish the trends and causalities.

The WHO (2005) noted that while disasters create hardships for everyone, natural disasters on average kill more women than men, or kill women at a younger age than men. There is a socially-constructed and gender specific vulnerability of women to natural disasters. This argument concurs with the study that Neumayer and Plumper (2007) undertook in 141 countries. It is however important to highlight that women are not victims but live in a society where they have always been socially excluded. Women's assets such as resources and land, knowledge, technology, power, decision-making potential, education, healthcare, and food have been identified as great determinant factors of vulnerability and adaptive capacity (Aguilar, 2009). People are more vulnerable and insecure when their assets are eroded hence there is need to ensure that women's asset base is built up in order for them to respond to climate change in a more positive manner.

The majority of rural inhabitants are women and studies have shown that most female-headed households are vulnerable to poverty hence the coining of the term “feminisation of poverty.” There are two categories of female-headed households, “the de jure female-headed households, that is, households headed by never married, divorced, widowed or separated women; and the de facto female-headed households, that is, households in which the male partner is absent, but may still influence household decision-making” (Flatø, Muttarak, & Pelser, 2017:45). The different categories of female-headed households experience vulnerability differently as they have different adaptive capacity. Madzwamuse (2010) pointed out that the poor have limited coping strategies in times of stress resulting from climate change. Similarly, Nelson (2011) noted that women and female-headed households tend to have fewer resources to cope with and adapt to stresses of all kinds, and rely on more climate-sensitive resources and livelihoods. In addition, the places they live and their livelihood strategies make them vulnerable. The majority of rural dwellers are women and most of them rely of subsistence farming for survival. This is in contrast to a study conducted by Wawire (2003) in Kenya that showed that both men and women in Turkana District were affected negatively by drought and the resultant famine. Therefore understanding gender relations in a particular setting is important to draw conclusions that are applicable to a particular community. Nonetheless, there are new risks that can emanate over and above existing risks of climate change and the burden lies more on women than men.

There is however a growing scepticism about the statistics that state that 70% of women are poor hence they are vulnerable to climate change. Arora-Jonsson (2011) argues that there is lack of data or evidence to support such claims hence the credibility of such gender research is questionable. She further argues that the generalisation of women’s vulnerability to catastrophes makes it difficult to meet highly specific needs of particular women or men. She illustrates that a poor man in India is unlikely to be as

polluting as a woman in Sweden or for that matter as much a polluter as a rich woman in India. Therefore, it is important to base any claims on evidence, which makes this study in Mudzi district important to establish the vulnerabilities of women.

It should be noted that climate change is likely to continue for many decades even after mitigation efforts are successful due to lags and inertia in the global biosphere response (Midgely et al., 2007). It is estimated that by 2050, climate change could result in the extinction of 18-35% of species, hence affecting food security and health (Aguilar, 2009). It is imperative to ensure that the risks associated with these climate change vulnerabilities are reduced to promote women's development.

2.1.6. Understanding climate variability in Southern Africa

Southern Africa is a predominantly semi-arid region with high intra-seasonal and inter-annual rainfall variability, with extreme events such as droughts and floods occurring frequently (Davies, 2011; Mwafulirwa, 1999; Tyson, 1986). Chishakwe (2010) further highlighted that the climatic condition of the Southern Africa sub-region varies spatially from arid in the west through semi-arid and temperate areas in central zones to semi-arid in the east, with a few sub-humid areas in the central regions. The Regional Vulnerability Assessment Committee concurred that the Southern African Development Community (SADC) member states are subject to climate variations. Mubaya et al., (2012) emphasised that droughts are the main climatic issue in the region however; floods were reported in Malawi, Mozambique, parts of Zimbabwe, and Southern Zambia. They further alluded that Zimbabwe and Zambia are the worst drought-affected countries in the region which are characterised by a late start to the rainy season, prolonged mid-season droughts, and shorter growing seasons. Zambia might be one of the worst drought-stricken countries in the region as indicated by Mubaya et al., (2012), however the Agriportal (2016) reported that the agricultural sector was booming more than the neighbouring countries such as Zimbabwe due

to farm subsidies, which calls for further investigation on how they are managing it.

Droughts corresponding to ENSO warm events have been shown to be associated statistically with disasters in Southeast Asia/Oceania and Southern Africa (Dilley & Heyman, 1995). Holloway (2000) highlighted that the 1992 drought which was triggered by an El Nino event compounded a range of vulnerabilities, thereby resulting in the regional maize harvest shortfall greater than 50%. Similarly, another drought hit the region in 1994/5 which resulted in a 35% production shortfall. In 2000, the entire region experienced Cyclone Eline which caused immense damages and deaths, with Mozambique bearing the major brunt by recording more than 700 deaths and 250,000 displaced people (Holloway et al., 2013). In 2001, more than 500,000 people were displaced by serious flooding in Zambezi River hence the call for strengthened flood risk management and coordination in many Southern Africa countries. The 2015/16 El Nino led to one of the driest rainfall season in over 35 years in Southern Africa resulting in low agricultural production thereby increasing levels of hunger, malnutrition, and vulnerable people (SADC, 2016). It should be noted though that although the whole region was faced with El Nino, unlike Zimbabwe and Malawi, some countries such as South Africa and Zambia did not receive external food assistance due to their internal drought management systems. This brings the issue of contextualising the depth of natural disasters and how different countries within the region respond.

Tyson (1986) linked the rainfall variability to changes in the atmospheric circulation. In concurrence, Davies (2011) and Lindesay (1988) indicated that Southern Africa inter-annual rainfall variability is linked to the El Nino-Southern Oscillation phenomenon which is an interaction between the ocean and atmosphere over the tropical Pacific Ocean that has important consequences for weather patterns around the globe. Rain variability is also debatably linked to Quasi-Biennial Oscillation (Mason & Tyson, 1992;

Naujokat, 1986) which refers to zonal wind in the equatorial stratosphere which changes direction from easterly to westerly and vice versa with a periodicity of 28 months (Naujokat, 1986) and Sea Surface Temperature (Folland, Palmer, & Parker, 1986; Nicholson & Entekhabi, 1987; Nyenzi, 1988) over Pacific, Indian and Atlantic oceans and topography (Ropelewski & Halpert, 1989).

Agriculture remains the primary source of subsistence, employment and income for 61% of the region's total population of 232 million although it has seen some declines and been highly variable (Chilonda, Machethe, & Minde, 2007). It should be noted though that within the region, some countries are more vulnerable than others due to their dependence on agriculture. Eriksen et al., (2008) pointed that in Tanzania, Mozambique, and Malawi, more than 80% of the population is employed in agriculture, in contrast to South Africa and Mauritius, where less than 20% of the population is dependent on agriculture. Furthermore, differential vulnerability could be understood by looking at the provision of services and access to alternative livelihoods which may vary dramatically between villages and even between households in the same village (Eriksen et al., 2008).

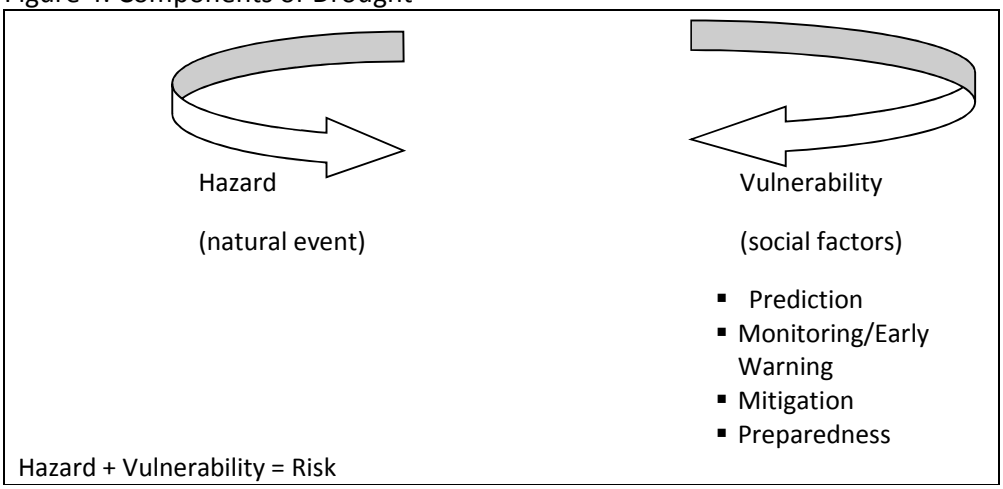
Given the increasing climatic variations in Southern Africa, compounded with socio-economic challenges such as poverty and HIV/AIDS, the marginalised people in the region are made more vulnerable; even then, this can vary within the same region. It is thus important to understand vulnerability in context thereby addressing some of the factors that contribute to vulnerability. It is also important to understand the early warning systems which communities rely on in predicting droughts as this forms a basis on which they prepare to buffer themselves from extreme consequences of droughts. The next section discusses elements of droughts and the early warning systems which communities utilise.

2.1.7. Droughts and early warning systems

Wilhite and Glantz (1985) categorised the measurement of droughts into four types which are: meteorological, hydrological, agricultural, and socio-economic and provided different conceptualisation of each category. Meteorological droughts refer to the degree of dryness and the duration of the dry period. Hydrological drought is associated with the effects of periods of precipitation (including snowfall) shortfalls on surface or subsurface water supply (that is, stream-flow, reservoir, lake levels, and ground water). Agricultural drought links various characteristics of meteorological or hydrological drought to agricultural impacts, focusing on precipitation shortages, differences between actual and potential evapotranspiration, soil water deficits, and reduced groundwater or reservoir levels. It also accounts for the variable susceptibility of crops during different stages of crop development, from emergence to maturity. Socio-economic drought occurs when the demand for an economic good exceeds supply as a result of a weather-related shortfall in water supply. Folger and Cody (2015) pointed out that drought often becomes an issue when it results in a water supply deficiency.

According to Wilhite (2000), droughts have both a natural and social component in that their occurrence depends on the region's exposure and the vulnerability of the society. A drought of the same intensity, duration and spatial characteristics will have different effects in different regions (Singh, 2006). As illustrated in Figure 4, early warning systems are an important factor in ascertaining the vulnerability of a community or people. Any hazard such as drought combined with a vulnerability scenario poses a risk hence there is need to mitigate and prepare for droughts but this needs prediction and early warning systems to be in place. Worldwide, drought disasters occur much more frequently during and following the mature phases (i.e. year two) of multi-year ENSO warm events than at other times, probably owing to prolonged or successive droughts, accompanying the event in teleconnected areas (Dilley & Heyman, 1995).

Figure 4: Components of Drought



Source: Wilhite (2000)

On the other hand, O'Farrell, Anderson, Milton, and Dean (2009:37) in Southern Africa recorded traditional early warning indicators including: "variation in the timing and sounds of winds and rains, the use of livestock appearance such as the quality of their fur, the appearance of termites and their mounds, birds and their specific colour, the absence of mole hills or the presence of poisonous plants, the flowering of certain tree species, the appearance and size of stars, and higher-than-normal temperatures". Salick and Byg (2007) explained that while scientific explanations of climatic changes have mainly concentrated on anthropogenic, greenhouse gas emissions; local interpretations of observed climate changes are often much more varied and encompassing. Although they assist people in making sense of observed climate changes, they do not necessarily empower them to act (Salick & Byg, 2007).

According to Davies, Buchanan-Smith, and Lambert (1991), early warning systems can be defined as a system of data collection to monitor people's access to food, in order to provide timely notice when a food crisis threatens and thus to elicit an appropriate response. Different countries have different early warning systems and gender influences how people respond to the early warning systems. Governments and donor agencies collaborate in making assessments and their relationship is important in order to respond

effectively to the needs of the beneficiaries. In order to respond appropriately and effectively, a vulnerability profile is drawn which includes trends in recent rainfall, production, prices, nutritional status, soil fertility, household status, and environmental status (Ayalew, 1994).

Early warning information systems (hazard mapping, market monitoring, meteorological monitoring, conflict mapping, climate variance mapping, geo-spatial data, and so forth) can provide vital information about the nature, location, depth, penetration, appropriateness, and type of a response to a shock (World Bank Group, 2016). Early warning of impending adverse climate conditions, when combined with effective responses to stabilize household food consumption can prevent cyclic depletion of household assets and impoverishment (Hansen, Dilley, Goddard, Ebrahimian, & Ericksen, 2004). According to Dilley and Heyman (1995), disasters do not automatically result from periods of reduced rainfall or even hydro-meteorologically defined droughts such as may be caused by ENSO warm events in the drought-prone regions. Disasters are by definition extreme events that occur only when the magnitude of the triggering event has been sufficient to overwhelm the coping capacity of the affected population (Dilley & Heyman, 1995). Therefore planners, decision-makers and farmers in teleconnected regions who recognize the propensities of their countries for precipitation fluctuations during ENSO years can take appropriate steps to limit adverse impacts (Dilley & Heyman, 1995).

Interpreting early warning information based on probabilities was particularly difficult for decision makers who need to relate it to their own perceptions of risk (Buchanan-Smith, 2000). Although the 1997 El Nino predictions were correct, the interpretations were incorrect thereby calling for customized forecasts and appropriate interpretations (Thomson, Jenden, & Clay, 1998). According to Wilhite, Sivakumar, and Wood (2000), drought forecasts often do not provide the specificity of information needed by farmers and others (e.g., the beginning and end of the rainy season,

distribution of rainfall within the growing season) to be useful for operational decisions. As a result, this impedes the roll-out of plans accordingly as little information, which is not usually correct, is shared. Moreover, in communities such as Mudzi district, the drought forecasts make little difference as people cannot plan effectively due to their poverty levels. The intervention of NGOs or government in these communities resuscitates the ailing situation.

There are early warnings systems in Zimbabwe which are under the Ministry of Environment, Water and Climate through the Meteorological Service Department and Ministry of Agriculture through Agriculture Research and Extension Services (AGRITEX) at national level (Nangombe, 2013). There are other agencies such as the Famine Early Warning Systems Network (FEWSNET), and the Zimbabwe's National Early Warning Unit (NEWU) that also issue early warnings for droughts. However, Nangombe (2013) pointed that the early warning systems in Zimbabwe are not effective at national level and highlighted that there is no substantial establishment of a visible structure. Although these systems exist, it is not enough to warn against droughts without preparation on how to respond. Although weather information is available in the Southern African region, the challenge is to ensure that weather information such as forecasts are translated into management decisions if crises are to be avoided (Masendeke & Shoko, 2014).

Female farmers in the Afram Plains of Ghana highlighted the importance of seasonal forecasts in choosing which crops to plant and when to prepare the land to counter low crop yields even though the seasonal forecasts are not always reliable (Codjoe, Atidoh, & Burkett, 2012). Similarly, Ugandan farmers indicated that forecasts from the Ugandan Department of Meteorology, along with their own knowledge and observations, helped them decide whether or not to plant slower maturing crops for a particular season and to make a decision on whether to clear, cultivate and plant a

larger area than usual (Orlove, Roncoli, Kabugo, & Majugu, 2010). It is thus important to ensure that early warning systems are in place to enable farmers to make the right decisions. Thus, in some contexts, the decisions are not made due to apathy and lack of resources to respond effectively to droughts. In contrast to the usefulness of seasonal forecasts, Ziervogel and Calder (2003) cited that forecasts are not always as useful as anticipated although there is growing evidence of their utilisation. They indicated that due to the probabilistic nature of forecasts, it is risky thus caution should be taken to reduce vulnerability when the actual climate is different from the predictions. Despite this challenge, early warnings play an important role in preparing farmers to plan ahead if the predictions are correct and utilised purposively.

2.1.8. Governance of climate risks and droughts

Governance is defined as the exercise of economic, political, and administrative authority to manage a country's affairs at all levels, comprising the mechanisms, processes, and institutions through which that authority is directed (UNDP, 1997). Three characteristics of governance which are pertinent to climate variability and gender studies are inclusiveness, equity and participation of vulnerable women in decision-making. Governance issues are an important aspect that should be considered in climate adaptation and mitigation as many stakeholders need to plan and implement policies that address the challenges faced. Moreover, there should be a conscious effort to engage grass-root level men and women through the utilisation of gender inclusive participatory tools (Ngigi, 2009). The capacity of communities and regions to adapt is at the centre stage of climate management. Adaptive capacity is defined as "the ability of a system to adjust to climate change (including climate variability and extremes), to moderate potential damages, to take advantage of opportunities, or to cope with the consequences,'' (IPCC, 2001). It is important to understand the process through which institutions at different scales are affected and respond to climate variability as a means to assess

how prepared they might be to respond to and recover from future climate change (Lemos, 2007). According to Kronik and Verner (2010), slow-onset hazards do not always demand humanitarian intervention, particularly when governments and communities work together to reduce the impact on affected people. It is important to engage multiple stakeholders in all aspects of adaptation efforts, from analysing challenges, to developing and implementing plans, to monitoring and evaluating results, to advocacy in the policy arena (Mogelgaard, 2015).

United Nations secretariat of the International Strategy for Disaster Reduction (UNISDR) (2009) highlighted that leaders and other high-level authorities must commit to disseminate information and implement policies to help reduce human suffering and environmental degradation resulting from droughts. In addition, different stakeholders should have the ability to self-organise, share knowledge, promote strong leadership, encourage shadow networks, and facilitate polycentric decision-making over multi-scales (Cooper & Wheeler, 2015). Similarly, during disasters, good leaders promote equity and inclusiveness, without undermining the organisational functions such as raising funds, maintaining cohesiveness and mediating multiple risks (Thapa, Scott, Wester, & Varady, 2016). However, Kronik and Verner (2010) cited that evaluations still criticize the apparent lack of learning and the repetition of mistakes, including the fact that the humanitarian system often does not intervene until the crisis stage. In concurrence, Makoka (2008) revealed that despite the on-going anti-poverty programs in Malawi, the severity and depth of poverty shows that they are not sufficiently effective. Failure to utilise lessons learnt in programming creates a cycle of failed projects hence funds continue to be injected for projects that do not change people's lives.

On the other hand, community participation from a bottom-up approach is recommended in drought risk management to ensure that there is a transition from policy to practice (UNISDR, 2009). UNDP (1998) pointed that

the systemic governance approach can ensure that communities are motivated and entrusted with the care and protection of natural systems and that decentralised management and control of environmental resources can increase trust, transparency, and accountability. A bottom-up approach in itself is not enough to manage droughts as there are various aspects that this approach cannot handle. Hence, an integrated approach that recognises the input from both communities and stakeholders is encouraged.

Lemos (2007) suggested that there is need to identify and subscribe to risk management approaches that create positive synergies across the state-society divide, drought response planning or water management institutions which may create the conditions to build longer term resilience among vulnerable groups. She further pointed that approaches that are inclusionary (participatory), accountable, transparent and democratic, might be more conducive for the empowerment of citizens and social reform. Cooper and Wheeler (2015) argued that sub-Saharan Africa governance is often prescribed through centralised structures with rigid bureaucracies, little or no accountability or transparency, weak institutions, tight controls of information and corruption, of all which exacerbate vulnerability. This trend was also observed in the Caribbean Islands where it was reported that there were silos in public environmental governance architectures, insufficient political will, and unwillingness to share data, unsustainable project-based funding and lack of accountability which hindered the climate policy coherence (Scobie, 2016). This in itself does not breed a good ground for adaptation to climate risks as the actors involved will not be exercising good governance. Thus there is need to create an environment which promotes good governance which benefits the stakeholders and the communities served. Good governance ensures that vulnerable groups such as women are represented politically and economically thereby attempting to redress their plight.

According to UNDP (1998), good governance depends on public participation to ensure that political, social and economic priorities are based on a broad societal consensus and that the poorest and most vulnerable populations can directly influence political decision-making, particularly with respect to the allocation of development resources. Moreover, people need to take responsibility for their own development for it to be sustainable. Khotari and Valodia (1998) posited that facilitating good governance through women's inclusion and participation will improve governance and promote gender equity in public policies and programmes. However, countries such as China, Vietnam, and Cambodia are growing rapidly despite poor governance which contradicts the popular belief that economic growth is correlated to good governance (Rodrik, 2008). He further argues that although poor governance might be a binding constraint in countries such as Zimbabwe, the governance reforms are neither necessary nor sufficient for growth. Similarly, Fukuyama (2013) pointed that the actual impact of democratic institutions on growth is highly contextual.

Ferguson (1994) argues that in most countries, governments are a relatively small clique with narrow interests thus cannot empower poor people. This is evidenced in Zimbabwe where there is a high unemployment rate with the majority of people living in poor conditions, yet the government remains adamant in holding on to power and ignoring the plight of the people. In the same vein, Pons-Vignon (2011) postulated that dialogue and negotiations with governments in adopting reasonable and balanced policies is always futile. Policies exist in countries such as Zimbabwe but they are either detrimental to the economic development of the citizens or they are not practised. On the other hand, Fukuyama (2013) pointed that there are outputs that are simply not the consequences of public action; rather the environment and the society contribute to the results. In linking governance and sustainable livelihoods, Hoon and Hyden (2004) highlighted that sustainable livelihoods which focus on empowerment and enhances access to resources, calls for a change in rules and by implication, a shift in power

relations. Thus, the approach addresses the concerns of those whose livelihoods are threatened thereby drawing attention to the constitutive side of politics which is governance.

Institutions can either hinder or promote progress in community development. The characteristics of an institution merged with the incumbents that implement the policies determine how effective they can be. Goetz (1995) defined institutions as sets of formal and informal rules which shape social perceptions of people's needs and roles. On the other hand, Acemoglu (2008) explained that institutions encourage growth-enhancing environments and create incentives for investment and technology adoption, for its businesses to invest, and the opportunity to accumulate human capital for its workers. Positive energy and an enabling environment breed gains for development. Deolalikar, Brillantes, Gaiha, Pernia, and Racelis (2002) reiterated that all the factors that cause poverty to decline, such as pro-poor growth, social development, and good governance, are dependent on political will and commitment from the government institutes. However, institutions may encourage rent seeking activities, corruption, and the unfettered pursuance of personal gain at great cost for the whole society (Acemoglu, 2008). If the challenges are not addressed at the root cause, the environment in which institutions exist becomes dysfunctional. However, institutional reforms are possible through changes in policies which nonetheless need to be scrutinised to ensure that the underlying constraints are curbed (Acemoglu, 2008). Changes in policies without transforming the environment to a large extent produces same results thus the need for an overhaul shift of institutions for tangible success.

The current governance structures need to be redesigned as they are out-dated and were formed when climate issues were not an issue (Termeer, Dewulf, Karlsson-Vinkhuysen, Vink, & van Vliet, 2016). Lemos (2007) suggested approaches that integrate risk management with sustainable

natural resources use and adaptive governance may be more conducive to social learning and to building resilience and social capital than top-down approaches that insulate decision making from stakeholders. It is important to appreciate decisions made at stakeholder level, however, they can only be applied when and if there is community engagement and participation. Political institutions have a mandate to reduce the vulnerability of weaker groups in society through the decisions that they make. According to Brown et al., (2012), although women (and children) are expected to be disproportionately affected by climate change, they remain largely absent from decision-making processes on climate change adaptation and disaster risk reduction. Governance and vulnerability of women to droughts interplay as the decisions made on climatic issues at the top level determine the women's participation in communities to make sound adaptations.

On a local level, Hoon and Hyden (2004) pointed that opportunities to participate in making decisions should be encouraged for both men and women; however governance must be seen as complementary to other supportive measures. In the same vein, Ferguson (1994) reiterated that political participation is an important form of engagement to curb imperialist policies. Thus participation is viewed as a game changer in development which assists women and men to express their voices in decisions that affect them at both micro- and macro-levels. Moreover, Goetz (1995) echoed that getting institutions right for women entails feminist political activism across all social institutions and within individual organisations. Bracking (2014) concluded that less faith must be placed in the use of finance to prevent climate change in the absence of real governance innovation, based on scientific knowledge to cut emissions. Thus promoting good governance is central in climate adaptation and mitigation efforts on an international level thereby infiltrating the local communities. In the next section, the researcher looks at the disaster management plans and policies in Southern Africa thereby identifying gaps in responding to droughts with a

gender lens in order to bring out the gender neutrality of the existing instruments.

2.1.9. Disaster management plans and policies

Droughts are slow, creeping in nature thus allow sufficient time for the policy planners to devise critical drought management strategies (Anjum, Saleem, Cheema, Bilal, & Khaliq, 2012). Miyan (2015) explained that drought is a trans-boundary and basin-wide issue hence more complex in assessment and alleviation than floods. There are different stakeholders that assist communities in times of natural disasters and these include governments, international NGOs, churches, local based NGOs, and so forth. Furthermore, Wilhite and Svoboda (2000) suggested that drought plans should contain three basic components which are: monitoring and early warning, risk assessment, and mitigation and response. Further, Wilhite, Sivakumar, and Pulwarty (2014) identified three types of drought policy responses, which are, the post-impact (often crisis-oriented), the pre-impact (often vulnerability reduction and resilient oriented), and the development and implementation of preparedness plans and policies (often focused on institutional capacity, including organisational frameworks and operational arrangements). In 2000, Wilhite found that there were no drought plans or policies in all countries in Southern Africa apart from Botswana and South Africa. Since 2000, a number of countries have developed policies and plans in mitigating disasters. In addition, bodies such as United Nations and United States Agency of International Aid (USAID) have developed their own internal policies which they utilise in their humanitarian work.

However, it has been found that many of these policies are gender blind. According to Otzelberger (2011), one of the biggest challenges is the development of useful methodologies for gender monitoring at national level and above, that is, for measuring the participation of women and men in the implementation of a policy or programme at all levels, as well as its impacts on gender relations and inequalities. She reiterated that although most

bilateral and multilateral agencies had gender mainstreaming policies in place, there was a lack of leadership and of translation of the messages into clear, systematic action steps.

In analysing a few policies, the World Food Program Disaster Risk Reduction Policy mentions women as vulnerable to disasters yet it is vague on how issues of the vulnerability of women can be addressed in response to disasters. Similarly, the USAID Disaster Risk Reduction Plan 2012-2014 mentions women in passing as important in increasing community resilience yet fails to address the root cause of women's vulnerability. Establishing gender sensitive programmes and enabling equal participation of women in programmes is not enough in dealing with long-term damages that many women suffer neither can it transform women's plight instantly.

Seymour and Desmet (2009) expressed discontent with policies such as the Accelerated and Shared Growth Initiative for South Africa which propose 12 projects that are water-intensive and unsustainable given the occurring frequent droughts. This portrays poor planning on an institutional level which has negative consequences on the projects' beneficiaries. In the Great Horn of Africa, Mwangi (2007) alluded that policies are made by men and they are silent about the vulnerability of women to climate hazards. Nonetheless, Von Kotze (1996) highlighted that the planning of development programmes should incorporate questions of gender; and women should be involved at every stage of disaster management planning and operations. Moreover, Bhatt (1995:3) coined the term gender silence which is described as the failure to acknowledge explicitly or implicitly that disaster management is occurring on a gendered terrain. There is need to explicitly acknowledge women and men in policies and ensure that it is not only on paper but there is a clear implementation strategy.

2.1.10. Social protection measures in droughts management

Social protection is an approach towards thinking about the processes, policies, and interventions which respond to the economic, social, political and security risks and constraints that poor and vulnerable people face, and which will make them less insecure and less poor, and more able to participate in economic growth (Luttrell & Moser, 2004). It describes a set of policies that governments can pursue in order to provide protection both to the 'active poor', enabling them to participate more productively in economic activity, and to the less active poor, with considerable benefits for society as a whole (Shepherd, Marcus, & Barrientos, 2004). Devereux and Sabates-Wheeler (2004) in describing transformative social protection in their conceptual framework argued that in addition to being protective (providing relief), preventive (averting deprivation) and/or promotive (enhancing incomes and capabilities), social protection interventions may be transformative. According to Holmes and Jones (2010), the transformative view of social protection extends to arenas such as equity, empowerment, and economic, social and cultural rights, rather than confining its scope to economic risks (which translates to narrow responses based on targeted income and consumption transfers).

All interventions from public, private and voluntary organisations, and informal networks to support communities, households and individuals in their efforts to prevent, manage and overcome risks and vulnerabilities are considered as social protection systems (Shepherd et al., 2004). A social protection approach can make a strong contribution, alongside other approaches, both towards preventing the slide into poverty and assisting with recovery, and towards the long-term reduction of poverty and multi-dimensional deprivation, as one way for chronically poor people or their children to escape poverty (Shepherd et al., 2004). According to the World Bank Group (2015), communities have an important role to play in the implementation of social protection programs. For example, they can validate the criteria in the selection of beneficiaries, serve as communication

links between the government and the beneficiaries, and mobilize community support for disaster preparedness and response. Multi-systems exist in communities which are interdependent thereby supporting efforts in reaching the vulnerable groups and those at risk.

The World Bank Group (2015) pointed that social protection programs and systems have the potential to mitigate the adverse impacts of natural disasters ex ante and build resilience among the population. By providing a safety net to affected individuals, social protection programs can prevent beneficiary households from depleting already-limited savings, cutting expenditure on essential items, and reducing investments in human capital in the face of disasters (World Bank Group, 2015). The social protection systems buffer the disaster-affected groups against losing more of their assets. In concurrence, Shepherd et al., (2004) highlighted that the difficulties for poor people in recovering from shocks purely or largely through their own efforts, especially when shocks are multiple or sequenced, should not be underestimated. They further pointed that recovery takes longer for the poor and usually benefits from external help, whether from public policy or private support. Hence, social protection programs provide the much-needed assistance in times of disasters especially in recurring shocks such as droughts.

The World Bank Group (2015) emphasised that social protection systems should be linked with climate change adaptation or disaster risk management and disaster risk financing and insurance systems. However, the three systems may co-exist but remain independent from each other, one of the systems may be stronger than the others, or some of the systems may not yet be established. Table 2 shows the benefits and challenges of social protection for adaptation and disaster risk reduction. Davies, Oswald, and Mitchell (2009) pointed that the social protection policy needs to learn from and incorporate DRR and adaptation approaches to ensure programmes continue to effectively support livelihoods and protect the poor

and excluded from shocks and risks in the face of climate change. Although there are benefits of social protection exhibited in Table 2, the implementation of these are highly exclusive to certain communities hence in countries such as Zimbabwe, where the environment is not conducive, these might take time to be substantiated.

Table 2: Benefits and Challenges of Social Protection for Adaptation and DRR

Social protection measure	Benefits for adaptation and DRR	Challenges
Cash transfers	- Targeting of most vulnerable to climate shocks - Smoothing consumption allowing adaptive risk-taking and investment - Flexibility enhanced to cope with climate shocks	- Ensuring adequate size and predictability of transfers - Long term focus to reduce risk over extended timeframes - Demonstrating economic case for cash transfers related to climate shocks - Use of socio-ecological vulnerability indices for targeting
Weather based crop insurance	- Rapid pay-outs possible - Guards against the adverse selection and moral hazard - Frees up assets for investment in adaptive capacity - Easily linked to trends and projections for climate change - Supports adaptive flexibility and risk taking	- Targeting marginal farmers - Tackling differentiated gender impacts - Affordable premiums for poor - Subsidising capital costs - integrating climate change projections into financial risk assessment - Guarantee mechanisms for re-insurance
Employment guarantee scheme	- Provides potential off-farm employment in rural areas - Public works can used as a physical response for building resilience against climate change impacts - Provides a guaranteed income to combat seasonal variation	- One job card per household may not be sufficient to support vulnerable and marginalised individuals - Can negatively impact on agricultural real wages - Lack of awareness means low enrolment rates -Inefficient compared to direct cash transfers
Asset transfers	- Ability to target most vulnerable people - Easily integrated in livelihoods programmes	- Ensuring local appropriateness of assets - Integrating changing nature environmental stresses in asset selection
Social Pensions	- Addressing the dualism of old people being unable to provide for themselves, and high levels of unemployment and very low incomes limiting the ability of the poor to care for their elderly - Targeting most vulnerable to climate change shocks. - Providing a guaranteed household income.	- Cost inefficiencies (arising from inclusion errors) - 'Perverse redistribution of income', as rich people outliving the poor people - High transaction costs

Source: Davis et al., (2009)

Chitonge (2012) argued that there is lack of political commitment by low-income countries to provide social protection as it is perceived that only rich countries can afford. In reality, the cash-strapped government of Zimbabwe

is unlikely to meet the basic needs of its marginalised members. Thus, the implementation of these social protection measures is hindered by the ailing economy which is struggling to even provide salaries for the civil servants on time. Civil societies might assist in implementing the social protection measures but the environment is too volatile and unpredictable thereby limiting the extent of assistance that can be provided.

Beyond giving relief, programs should look at building resilience and adaptive capacity for beneficiaries. A disaggregated analysis of vulnerability is necessary to understand its varied sources and degrees, with the consideration that an appropriate approach to dealing with risk and vulnerability can be developed, and a range and combination of social protection policies can be designed (Shepherd et al., 2004). Targeting vulnerable households - in addition to the already destitute - will protect households against heightened risk and minimize unnecessary poverty in future generations (Carter & Janzen, 2015). Furthermore, the outpouring of both in-kind and cash transfer programs that have been largely focused on helping poor families invest in the nutrition, health and education of their children assists in diminishing poverty levels that perpetuate in the next generation (Carter & Janzen, 2015).

Insurance is highly valuable to vulnerable households, yet there are the most liquidity-constrained, and incremental assets are highly valuable (as a form of protection) for these households (Janzen, Carter, & Ikegami, 2013). The unwillingness of the vulnerable to purchase insurance is primarily driven by liquidity constraints, it may be suspected that their demand would be highly price elastic and sensitive to the partial subsidization of insurance (Carter & Janzen, 2015). Nonetheless, when subsidies cut the cost of insurance in half, demand by the vulnerable responds rapidly with implied gains in reduced vulnerability (Carter & Janzen, 2015). Very low incomes, an absence of a strong economic growth path, scarce public revenues, and a strong subsistence sector, all constrain poor countries from establishing effective safety nets and social security systems (Shepherd et al., 2004).

However, exposure to uninsured risks can create poverty traps: households are prevented from taking reasonable risks, and engage in low-risk, low-return activities, keeping a stock of liquid but not necessarily very productive assets which can be sold off in an emergency (Shepherd et al., 2004). Thus, social protection can change the perception of risk by poor people, such that they invest in riskier, higher return activities, accumulate diversified portfolios of assets, and put some of them to higher return uses (Shepherd et al., 2004).

Social protection needs to consider the different impacts of shocks on men and women to ensure efficiency and better protection of the measures taken (Luttrell & Moser, 2004). Vulnerability and risks vary within the life cycle and by gender: it is important that social protection policies and programmes recognise and address these variations (Shepherd et al., 2004). Although it helps to have a disaggregated understanding of risk and vulnerability, it does not immediately follow that a disaggregated (or targeted) policy response is appropriate (Shepherd et al., 2004). There is a common assumption that by simply targeting women, programmes are automatically addressing gender inequality (Holmes & Jones, 2010). According to Patel and Hochfeld (2011), social protection programmes ignore social barriers to women's equal economic participation, including gender-fair distribution of resources yet gender equity is a social protection goal. In addition, Hassim (2008:115) argued that women's unpaid labour is exploited to subsidise state failures. The intention of institutions to empower women produces exploitation hence miss the point by perpetuating existing underlying gender dynamics. Policies with the best intentions are subject to scrutiny as they are open to interpretation thereby creating a win-lose situation.

Gender dynamics shape the types of risks that are tackled, how they are tackled, political and public buy-in and implementation practices. Social protection programmes are rarely gender neutral, and many exacerbate or contribute to inequalities (Luttrell & Moser, 2004). An example of building a

new well closer to people's homes, or investing in irrigation means that women spend less time collecting water thereby can free up women's labour for productive activities (Farrington, Slater, & Holmes (2004). Thus, social protection approaches should be examined on the extent to which they reinforce women's traditional roles and responsibilities or harness the potential for a transformation of gender relations in both economic and social spheres (Holmes & Jones, 2010).

However, Luttrell and Moser (2004) argue that the intervention addresses only the 'gender-intensified' constraints, and not the 'gender-specific' constraints that explain why it is women and not men who collect water. Explicit attention to empowerment in design features is needed in order to see a significant change in relation to gender inequality (Holmes & Jones, 2010). Targeting of social protection measures becomes important once the distinction between the different categories of constraints women face is recognised (Luttrell & Moser, 2004). Building social protection systems that are more inclusive and equitable, and that help make the poor and vulnerable more resilient to shocks (both idiosyncratic and covariate), are among the long-term challenges to eradicating poverty (World Bank Group, 2016). While the current abilities and capacities of many countries are insufficient to adequately respond to disasters, investing domestic resources in social protection systems that build households resilience before shocks occur and have the capacity to respond to shocks as they hit is a strategic priority (World Bank Group, 2016).

2.1.10.1. Coping mechanisms for droughts

Coping strategies can be classified as ex ante and ex post, according to whether they help reduce risk or reduce the impact of risk after production shortfall has occurred (Pandey & Bhandari, 2009). Ex ante strategies help reduce the fluctuations in income and are also referred to as income-smoothing strategies. These strategies involve taking up low risk activities even at the cost of low returns (Dercon, 2000). The most common ex ante

coping strategies of farmers in Africa include careful choice of crop varieties (e.g. drought tolerant and short maturing varieties), temporal adjustments of cropping patterns and adjusting planting dates and crop establishment methods; changing weeding and fertilization practices; and use of soil and water conservation practices (Shiferaw, Tesfaye, Kassie, Abate, Prasanna, & Menkir, 2014). In drought-prone areas, farmers use these strategies in different combinations and some of these strategies have become an integral part of the farming system and may not be easily identified as coping mechanisms (Pandey & Bhandari, 2009).

Income and crop diversification are common practices in ex ante coping strategies. Dercon (2000) argued that although different activities may be conducted at different times to provide income across the year, there are costs involved. For example, combining farm and non-farm activities limit the use of diversification as evidenced by Czukas, Fafchamps, and Udry (1998) who found that drought adversely affects not only crop income but also non-farm income. In addition, although intercropping serves to increase returns, there are costs in increased variability. Furthermore, Dercon (2000) highlights that non-agricultural activities or profitable alternative agricultural activities are not accessed easily because of working capital needs and skills requirements. As much as diversification provides some benefits, one has to count the costs in order to make the right decisions. In situations where there is little choice, diversification should be purposeful with an end result of obtaining sustainable income. Thus, it is important to establish the cost-benefit analysis of the different activities and select sustainable activities with high returns.

Ex post strategies are also referred to as consumption-smoothing strategies, as they help reduce fluctuations in consumption even when income fluctuates. According to Dercon (2000), ex post strategies deal with the consequences of income risk. Alderman (1998) found that consumption smoothing is more difficult with successive shocks than with a single shock.

Due to lack of alternatives, the poor tend to resort to coping mechanisms that are detrimental to their human capital such as reduction in food intake, withdrawal from school, or working long hours, thereby exposing them to further risks (World Bank Group, 2015). However, Hoddinott (2006) argued that even though asset smoothing is an attempt to preserve assets, consumption itself is an input into the formation and maintenance of human capital. Hence "the true distinction lies in households' choices regarding what type of capital – physical, financial, social or human (and which human) – that they should draw down given an income shock." Without appropriate, timely, and predictable response mechanisms, poor and near-poor households are often compelled to resort to negative coping strategies after a disaster strikes, exposing them to further hardship (World Bank Group, 2016).

There is a sequence in which households respond to droughts and this is contextual. Households often initially respond in terms of forced reduction of expenditures on certain 'non-essential' items such as clothing, social functions, food and medical treatment, adjustments in food balance and move progressively to reliance on public relief and safety-net programs and exploitive environmental management practices (Pandey & Bhandari, 2009; Skoufias, 2003). Exposure to frequent distress from climatic shocks progressively leads to depletion of assets and weakens the ex post adaptation options, making households unable to adapt to and manage even smaller perturbations in production conditions (Shiferaw et al., 2014). Coping capacity is directly linked to entitlements, or the set of commodity bundles that a person can command, and thus consumption in the face of an adverse event (Eriksen, Brown, & Kelly, 2005).

Dercon and Krishnan (2000) found that poor households do not engage in complete risk-sharing between husbands and wives; women in these households bear the brunt of adverse shocks. In a study carried out in Kenya and Tanzania, Eriksen et al., (2005) established that gender had an

important influence on how the trend of specialization by individual household members manifested itself in the effectiveness of household coping patterns and thus levels of adversity. For example, women could not devote as much time as men in non-farm activities as they were overwhelmed with domestic responsibilities. In cases where they practised petty trade, or handicraft, the income obtained was little. In contrast, men had greater mobility, fewer domestic duties and easier access to resources such as capital (Eriksen et al., 2005). Gendered access to labour power, capital, natural resources and skills, and restricted mobility, excludes many women from successfully specializing in principal coping strategies (Eriksen et al., 2005). What emerged from this study is that women conformed to the less lucrative coping mechanisms due to the gender stereotypes. In cases where the women sold grass or engaged in casual labour as men did, the income derived from there was less due to negotiation powers and the quality of labour.

According to Ashraf, Routray, and Saeed (2014), factors such as annual income, family labour, education level of the household head, and social support could increase farmers' ability to avoid consumption smoothing, assets depletion, and migration. In countries such as Zimbabwe, social support is difficult especially within the communities as everyone else is struggling. Migration has assisted many families in Zimbabwe as remittances received from the diaspora keep many homes from poverty. In Zimbabwe, the education system is failing to be justified as many graduates cannot be employed. Although graduates can migrate to other countries, migration laws are not always favourable and employment is not always guaranteed. Thus it is important to weigh the costs and benefits of the different coping mechanisms as the context determines their success or failure.

2.1.10.2. Adaptation strategies to droughts

There are many studies that have attempted to look at different adaptation strategies that have been employed in different drought-prone communities. Biowatch South Africa (2016:3) hailed agro-ecology which is "a multi-faceted approach that employs principles to farming methods that build on traditional knowledge and links producers to consumers in sustainable local food systems that enable food sovereignty and dignity in communities." Employing one adaptation strategy minimises the advantage of diversifying the adaptation strategies thereby benefitting from a unified approach. Selecting adaptation strategies that are suitable for one's environment, socio-economic conditions and cultural preferences improves production in a sustainable manner thereby lowering negative environmental and social costs (Silici, 2014).

According to O'Farrell et al., (2009), human adaptation and response to drought is primarily through evasion or endurance. How people respond to drought is a function of a variety of factors typically relating to the severity, frequency, and duration of the drought (O'Farrell et al., 2009). Evasion refers to the transhumance or seasonal migration of livestock which is usually constrained by land availability, animal health, and social issues. On the other hand, endurance refers to the preservation of the ecosystem dynamics to aid recovery after drought (O'Farrell et al., 2009). Seymour and Desmet (2009) listed different endurance responses that include: forage management, changing livestock types and numbers, water and soil conservation and finding alternative sources of income. Observed farmer adaptations to climate variability fall into two main camps: ex ante measures, for which action is taken in anticipation of a given climate realization and ex post responses, which are undertaken after the event is realized (Burke & Lobell, 2010). What starts as coping strategies in years of extreme weather conditions can become adaptations for households in the future (migration and livestock dependency, for instance) (Bhatta & Aggarwal, 2015).

There are some adaptation strategies that are applicable in certain communities; hence it is important to understand the context before proposing certain strategies. Moreover, it is crucial to identify the strengths and weaknesses of the different adaptation strategies based on the studies that have been undertaken and reflect their appropriateness in other contexts. In this section, water-harvesting, conservation agriculture and irrigation would be discussed as adaptation strategies that are being promoted in rural communities of Zimbabwe.

Water-harvesting

Reij, Mulder, and Begemann (1988) describe water-harvesting as a whole range of methods of collecting and concentrating various forms of run-off (rooftop runoff, overland flow, stream flow, etc.) from various sources (precipitation, dew, etc.) and for various purposes (agricultural, livestock, domestic and other purposes). Armitage (1985) cautioned that water harvesting is not always reliable in semi-arid areas as the rainfall is erratic hence suggested that the Mediterranean climate is more conducive to such an activity.

Reij et al., (1988) pointed out that water harvesting is dependent on the frequency, duration, and intensity of the rainfall as runoff only occurs once a certain threshold is exceeded. They further explained that the rainfall intensity should exceed the infiltration rate or the rainfall intensity and duration should exceed the storage capacity of the soil. Oweis and Hachum (2009) highlighted that successful implementation of water harvesting requires significant knowledge input such as the data on rainfall, soil and relief as well as information on cropping systems and the local socio-economic conditions. According to Kumar, Ghosh, Patel, Singh, and Ravindranath (2006), in regions with lower mean annual rainfall, rainwater harvesting as a dependable source of water is likely to be low.

Rain-harvesting techniques have been in use for over 4000 years and according to Kibassa (2013), they have demonstrated the potential of doubling food production by 100% compared to 10% increase from irrigation. Similarly, a six year economical and viability assessment study of water harvesting for wheat and barley in the farmer's fields of highlands Balochistan in Pakistan found that the wheat yield is increased by 180% and 80% under seasonal rainfall of 102mm and 282mm respectively (Rodriguez, Shah, Afzul, & Mustafa, 1996) thus reflecting that water harvesting practices yielded more in drier years (Oweis & Hachum, 2009).

In addition, water harvesting brings substantial environmental and social returns such as combating land degradation and migration from rural to urban areas and employment (Oweis & Hachum, 2009). There are however a number of constraints which limit its adoption and these include but are not limited to: lack of adequate characterisation of rainfall, evapotranspiration and soil properties; and risk of crop failure in drought years that may severely hit the poor (Kumar et al., 2006; Oweis & Hachum, 2009). Kumar et al., (2006) also identified high evaporation as a threat to surface storage structures.

Continuous understanding of a context is necessary to enable the practising of water harvesting techniques, moreover the involvement of the communities in mapping how to select the appropriate technique is important for its sustainability. Therefore this adaptation strategy can reap benefits for women who are vulnerable to droughts if it is embraced as a positive contribution to their community in attaining better agricultural production. However, it should be cautioned that it might not yield positive results due to the semi-aridness of the area yet it is important to consider it in seasons when there are good rains.

Conservation agriculture

Conservation agriculture (CA) upholds three principles which are: 1) minimum or no mechanical soil disturbance; 2) permanent organic soil

cover; 3) diversified crop rotations (Giller, Witter, Corbeels, & Tittonell, 2009; Kaumbutho & Kienzle, 2007; Knowler & Bradshaw, 2007). Baudron, Mwanza, Triomphe, and Bwalya (2007) described conservation farming as a package of different techniques and practices, incorporating elements of reduced tillage, in situ rainwater harvesting, soil fertility management and erosion control that when combined create cropping systems expected to increase sustainability of farming practices. Biowatch South Africa (2016) criticised industrial farming which includes mechanised tilling, and petro-chemical fertilisers and pesticides as killing soil life, thereby releasing carbon and destroying the fertility and water-holding capacity of the soil. The practice of conservation agriculture is an alternative in protecting the soil thereby yielding good yields.

Table 3: Benefits and Costs of Conservation Agriculture

Benefits	**Costs**
Reduction in on-farm costs: savings in time, labour and mechanised machinery	Purchase of specialised planting equipment
Increase in soil fertility and moisture retention, resulting in long-term yield increase, decreasing yield variations and greater food security	Short-term pest problems due to the change in crop management
	Acquiring of new management skills
	Application of additional herbicides
	Formation and operation of farmers' groups
	High perceived risk to farmers due to technological uncertainty

Sources: Adapted from FAO (2001); Kertész and Madarász (2014)

Chiputwa, Langyintuo, and Wall (2011) noted that conservation agriculture is resisted by small-holder farmers despite its benefits of water conservation and the improvement of soil structure. In areas where CA is adopted, not all components are adopted due to bio-physical factors (soil, climate and topography; socio-economic factors; institutional factors and technology

characteristics (Baudron, et al., 2007; Kaumbutho & Kienzle, 2007) yet for CA to be successful, all components need to adopted simultaneously (Chiputwa et al., 2011). Although there are some benefits that can be derived from conservation agriculture, there are also some shortcomings. Knowler and Bradshaw (2007) analysed the implementation of CA and found that the costs far-outweighed the benefits at a farm-level as shown in Table 3. Thus, it becomes challenging for small-holder farmers to invest in CA as their major priority is producing agricultural yields at a lower cost since they have limited resources.

Sarr (2012) explained that conservation tillage techniques have multiple benefits which include reduction of water loss by evaporation, and improved pest, diseases and weed control. However, conservation agriculture demands inputs such as specialised planting equipment and sprayers that small-scale farmers cannot afford as their major worry is obtaining seeds and fertilisers; moreover, there is no guarantee of immediate positive outcomes (Kaumbutho & Kienzle, 2007). Encouraging them to invest in highly priced equipment which does not meet their short-term objectives of food security might not derive the needed buy-in of adapting to droughts. Small scale farmers lack the capacity to control weeds using modern techniques of herbicide application hence they adopt the conventional weeding or shallow weeding and weed uprooting which have negative consequences to the soil (Kaumbutho & Kienzle, 2007).

On the other hand, Baudron et al., (2007) found that in Zambia, conservation agriculture called Muyamba pit farming is locally adopted to suit the environment whereby plants are planted in fertility pits filled with crop residue, compost, manure, compost or dried green manure. The entire farming calendar is moved toward the dry season, meaning that the farmers plant early thereby benefitting from the effective early rains, weed early, harvest early and attain food security early (Baudron et al., 2007). However, Kaumbutho and Kienzle (2007) argue that the unreliability and inadequacy

of rainfall and its changing patterns make the adoption of conservation agriculture by small-scale farmers difficult. In addition, Baudron, Jaleta, Okitoi, and Tegegne (2014) noted that the major cause of the low and slow adoption of conservation agriculture is competition for crop residues between livestock feeding and soil mulching. Crop residues are important in maintaining the fertility of the soil yet livestock also demand feed from the same source.

Giller et al., (2009) concluded that conservation agriculture is inappropriate for the vast majority of resource-strained smallholder farmers and farming systems although it can benefit other farmers with resources. Conservation agriculture is widely promoted as an adaptation measure to droughts yet it remains under-implemented due to some of the issues that this section tried to unpack. Hence there is need to continue looking for cheaper and viable alternatives that women can utilise based on their contexts. Alternatively, there is need to tailor-make this approach and still not lose the benefits that are derived from it.

Irrigation

Irrigation utilises technology to enable the provision of soil moisture for the benefit of agricultural production. According to Eakin (2003), access to irrigation, particularly from groundwater sources, can substantially reduce the sensitivity of the farm system to deficient, unpredictable, and variable rainfall. Ngigi (2009) described surface irrigation as one that involves diverting water from streams or rivers and dams by gravity and pumping, or pumping from groundwater and conveyed by open channel or pipe to the cropped area. On the other hand, drip irrigation delivers water in small quantities directly into the root systems of the crops and is more suitable for water scarce regions with a reduction of water use between 30% and 70%, while increasing crop yields from 20% to 90%. Schaible and Aillery (2012) pointed that high-pressure sprinkler and traditional gravity irrigation systems will become even less efficient as application losses increase due to higher

evaporation rates caused by rising temperatures. Similarly, irrigation might be limited in the future because ground water levels will be lowered by increased demand reduced precipitation (Dube et al., 2016). Water management remains a critical issue in the face of droughts hence there is need to select appropriate and efficient irrigation systems.

In the 1930s, the government of Zimbabwe surveyed suitable sites, designed and constructed state-owned irrigation schemes without the participation of the farmers (UNDP, 2001). The government selected the beneficiaries and if there was no interest, they brought farmers from outside to utilise these schemes and it was the duty of the government to maintain these schemes which became costly and unsustainable as the number of the schemes increased (UNDP, 2001). In the 1990s, the farmers were involved in the planning, implementation, operation, and maintenance of the new irrigation schemes. Nhundu and Mushunje (2010) reiterated that the Fast Track Land Reform Programme in 2003 negatively affected the irrigation schemes and they were reduced from 200,000 ha to 120,000 ha due to thefts, dilapidation, and vandalism of the irrigation infrastructures.

The World Bank (2008) hailed irrigation as the most viable means of reducing crop failure, hunger and malnutrition in Africa. However, the World Bank (2008) pointed that there are hardly any cases of successful and sustainable farmer-managed smallholder irrigation schemes despite interventions from governments, NGOs and private organisations. Mutambara and Munodawafa (2014) found that in Zimbabwe, the sustainability of small-holder irrigation schemes was hindered by limited access to agricultural inputs, education level or training in the appropriate farming skills, erratic irrigation water supply and lack of collateral to enable farmers to obtain working capital or loans. Eakin (2003) found that groundwater was also increasingly unreliable and scarce, exposing the vegetable farmers to variability in rainfall and the dry climate of the Nazareno region and to inevitable increases in energy costs as they mined

water from greater depths. This shows that water for irrigation is not always readily available and it becomes costly for poor people to manage the systems if there are no support mechanisms. The reports analysed in this study revealed that more than half of the existing irrigation schemes were not functional due to non-servicing.

Ngigi (2009) further stated that the majority of the existing irrigation schemes are inefficient due to deteriorating infrastructure, management capacity of irrigators and stakeholders, governance problems, political interferences in distribution of inputs to unwillingness of farmers to adopt new technologies with preference of traditional indigenous technologies. Chisango and Maposa (2016) concurred with the assertions from Mutambara and Munodawafa (2014) and Ngigi (2009) on irrigators' capacity and the resistance to adopt new technology. On the other hand, in a study conducted in Mexico between 1996 and 2000, Eakin (2003) found that irrigated vegetable production is not necessarily associated with appreciable wealth, livelihood security, or minimal exposure to climatic risk. The Nazareno vegetable farmers failed to accumulate wealth due to uncertain and risky processes of production and their difficulty in simultaneously diversifying their economic activities to mitigate risk and compete in the vegetable trade.

UNDP (2001) however pointed that wrong approaches to development coupled with wrong choices of technology are largely to blame for the establishment of unsustainable smallholder schemes. UNDP (2001) further argued that farmers are always willing to take charge of their own development as long as the right approaches are used and should be given a period of financial grace in order to contribute financially to the schemes. In sum, where irrigation is successful, measures are put in place for its success thus what is crucial is the willpower of farmers, availability of farming inputs and maintenance of the systems. In addition, favourable

constitutions that govern the schemes should be drawn to ensure that farmers obtain profits in a sustainable way.

2.1.11. Summary

A number of lessons can be deduced from the literature reviewed in light of the vulnerability of women to droughts. A global overview of climate change and variability issues was discussed with reference to Asia, Australasia, Europe, North America, Latin America and Africa. Since climatic issues are global, it was important to understand the challenges faced in different regions and the opportunities that exist. In general, all regions that rely on natural resources are affected by climate-induced disasters. However, it is the innovation and adaptive capacity that enables one region to be resilient and the other vulnerable. Different scholars have come up with the anticipated effects of climate change on biodiversity and ecology, water and sanitation, health, agriculture and rural livelihoods yet some have already associated some current climate variability to these sectors. It is important to understand the broad issues influencing climate change and variability to set linkages and variations in this domain.

However, this research is limited to droughts and women to allow confinement and narrowing of issues thereby enabling specific measures to respond to the challenges. The role of early warning systems was explained and how it is still a challenge for countries to plan in advance with the knowledge they have on impending droughts. The literature showed that women and men are affected differently by droughts and the vulnerability of women is different from one region to another. The coping mechanisms and adaptation strategies also differ hence contributing to how vulnerable different groups are. Men and women employ different coping mechanisms and adaptation strategies. More women than men resort to negative response strategies as they face limitations of mobility, capital and power. There is limited research on disaggregated data based on gender with

regards to water-harvesting, conservation farming and irrigation that was discussed in this review.

Policies developed by different agencies and governments are gender blind and at times gender silent hence unable to redress the imbalances that exist between men and women. The discussion on social protection measures highlighted that at times they proliferate gender inequality instead of curbing it. Thus there is need to design systems that are more inclusive and equitable, and that help make the poor and vulnerable more resilient to shocks. On the other hand, there are contradictions in the literature reviewed on the vulnerability of women to droughts. It was thus important to conduct this study to analyse the vulnerability of women to droughts through delving into the complexities of their livelihood strategies, coping mechanisms, and adaptation strategies in Mudzi district.

Table 4 shows similar studies that have been undertaken in Australia, Kenya, Nicaragua, Ghana and India. These studies were acknowledged in the problem statement, research methodology and discussed in some sections of the literature review. Some gaps exist in terms of locality, interpretations, control and concepts relevant to this study. In addition, the methodologies utilised are different from what was utilised in this study. Nonetheless, these studies give a perspective on the issues related to this study.

In the next section, different theories that influence this study are discussed and these theories locate vulnerability, resources or assets, coping and adaptation issues.

Table 4: Examples of Similar Research

Context	Aim	Findings	Gaps
Gender and drought: Experiences of Australian women in the drought of the 1990s: Stehlik, D., Lawrence, G., & Grey, I. (2000).	To gather the stories of both women and men in order to begin to develop the larger narrative — the social construction of drought.	Deterioration of family cohesion, loss of community networks, and in some cases, a sense of being abandoned by the rest of (urban) Australia	First world study might not be applicable to third world – cultural differences and socio-economic differences.
Gender and social and economic impact of drought on the residents of Turkana District in Kenya: Wawire, V.K. (2003).	To assess the adaptive strategies employed by men and women within their respective social and economic backgrounds to cope with challenges in the drought-stricken Turkana District	Men's authority reduced as household heads and breadwinners since women were in charge of the famine relief food. Women lacked time and energy to perform their gender roles under the strenuous drought conditions.	Looked at how men and women coped with disasters and does not look at the vulnerability of women. There is an intervention of relief food hence might not reflect the dynamics that happen in situations where there is no intervention
Changes in gender-differentiated vulnerability to drought in Nicaragua: Segnestam, L. (2008).	To interpret gender differentiations in vulnerability to drought in Nicaragua in the interplay among structures and resources over the past decades.	Drought induces a downward spiral among households with natural resource dependent livelihoods	Biased against women as vulnerable yet men's resources were impacted. Cannot tell how the conclusion that women are vulnerable was derived from as they relied on non-natural resources livelihoods
I cannot drink water on an empty stomach: a gender perspective on living with drought: Ghana: Arku, F.S., & Arku C. (2010).	To determine whether the Volta Rural Water Supply Project in Ghana was playing a role in minimising the harmful effects of drought on rural households	The consequences of drought in Tsibu-Dafor are that women spent longer hours at work, while men are forced to migrate to cities to work. Under-employed men in villages. The provision of irrigation facilities versus negative impacts of droughts.	A number of factors affect productivity apart from irrigation facility. No control study for comparison - biased finding
Drought, household risk coping and gender in rain-fed areas in India: Sahu, B.K. (2013)	To discuss whether or not the drought induced scarcity (water, employment, food, fodder etc.) is gender neutral in backward agriculture.	Women increased working hours and there was reduction in consumption and expenditure.	Does not state why women increased working hours and silent about gender vulnerability

Source: Own (2018)

2.2. Theoretical Framework

2.2.1. Perspectives of different theories

There are various theories that are utilised in understanding disasters and development. Some of the theories stem from sociology, psychology and development fields. This study looked at nine theories that are relevant to understanding the vulnerability of women to droughts and these theories are: the conflict theory, the theory of population, the food availability decline (FAD) approach, the human-environment systems (HES) theory, the behaviour theory, the social learning theory, the social identity theory, the conservation of resources theory and the ecological analogy. However, the closest and relevant theories that were applied in this study are the conservation of resources theory and the ecological analogy.

The conflict theory states that inequality exists because those in control of a disproportionate share of society's resources actively defend their advantages thus those with the most resources exercise power over others with inequality and power struggles result (Andersen, Taylor, & Logio, 2014). This theory could be applied to this study but does not look at the influence of coping mechanisms and adaptation strategies in the vulnerability of women to droughts. The researcher also looked at the food availability decline (FAD) approach by Sen (1981) which argues that anything which disrupts food production or supply can reduce food consumption, resulting in a subsistence crisis.

On the other hand, Malthus (1798) argued in his theory of population that population growth led to a constantly increasing demand for food which agriculture, given strictly limited land and other natural resources, would eventually be unable to satisfy. This was however challenged by Boserup (1965) in the theory of population as she argued that higher populations may lead to a more efficient division of labour and improved agricultural practices, moreover the necessary investment in agriculture is an important

aspect. Similarly, Weil and Wilde (2010) acknowledged that a high level of population reduces income per capita in poor developing countries, however, there are other factors that can counteract the negative effect of high population. They further argued that the effect of resource dilution on income per capita depends on how the resource enters an aggregate production function. In their demographic-economic simulation model, Ashraf, Weil, and Wilde (2013) posited that a reduction in fertility raises income per capita by an amount that some would consider economically significant, although the effect is small compared to the vast gaps in income between developed and developing countries. Although there can be some truths in these assertions, the lack of attribution to climate variability and gender dismisses these theories and models for this study. The FAD approaches assist in understanding the impact of droughts but concentrates more on food availability which is not the only challenge of droughts.

The human-environment systems (HES) theory looks at the interaction of human systems with corresponding environmental or technological systems (Scholz & Binder, 2003). There are six principles that guide the HES theory: (1) human and environmental systems are constructed as complementary systems, (2) a hierarchy of human systems with related environmental systems are considered, (3) environmental systems are modelled in their immediate and delayed dynamic reactions to human action, (4) the behaviour of the human system is modelled from a decision theoretic perspective differentiating between goal formation, strategy formation, strategy selection and action, (5) a conceptualization of different types of environmental awareness in each of these three steps can be developed, and finally (6) a distinction is made, with corresponding modelling reflecting this distinction, between primary and secondary feedback loops with respect to human action. This theory is applicable to analysing women and droughts yet misses the vulnerability aspect that explains women's confinement to failing responses. There are deeper social, economic, political influences

coupled with the changes in climate that continue to submerge women into perpetual vulnerability.

Skinner (1953) noted that a change in the environment may find us unprepared, but our behaviour usually adjusts quickly as we acquire new responses and discard the old. His behaviour theory illustrates that behaviour that is reinforced tends to be repeated. On the other hand, if behaviour is not reinforced, it is weakened. His theory is criticised for neglecting the role of inherited and cognitive factors in learning (McLeod, 2015). In understanding droughts and women, the behaviour theory does not explain why women continue to practise agricultural means for survival even though there are successive droughts which damage their crops. The social identity theory by Tajfel and Turner (1986) proposed that a person's sense of who they are depends on the groups to which they belong. This theory considers individuals in groups and does not explain individual dynamics that can influence the decisions that they make without being in a group.

According to the social learning theory by Bandura (1971), new patterns of behaviour can be acquired through direct experience or by observing the behaviour of others. He further proposed that people not only perform responses, but they also observe the differential consequences accompanying their various actions. As a result of prior experiences, people come to expect that certain actions will realise outcomes they value, others will have no appreciable effects, and still others will produce undesirable results. Actions are regulated by anticipated consequences. Bandura's social learning theory explains how people influence their environment and how the environment influences them yet it is silent about issues of vulnerability which are key to this study. The propositions cannot fully explain the vulnerability of women to droughts given their recurrence. It also does not explain why different women in one community have different responses to droughts thereby making some vulnerable and others resilient.

According to McEntire (2004), different theories have benefits and shortcomings hence one cannot dwell on one theory. In this section, the researcher focused on two theories to understand droughts, which are conservation of resources theory and ecological theory. These two theories are the closest out of the nine that the researcher looked at in terms of the concepts of vulnerability, livelihoods, coping and adaptation.

2.2.2. Conservation of Resources theory

The conservation of resources (COR) theory was formulated by Hobfoll in 1988 and it is a motivational stress theory in which individuals strive to obtain, retain and protect what they love. Prior to 2001, the theory was viewed as having a focus on the environment only and forsaking the self. However, Hobfoll (2001:338) delineated the theory as integrating the individual-nested in a family-nested in tribe, set in social context. He further posited that "the self derives from primary attachments within biological families and intimate social groups", which is delineated by cultural scripts and formulations.

The COR theory is influenced by Maslow's theory of human motivation which was formulated in 1954. The theory proposes that people seek physical resources, then social resources, then psychological resources in a hierarchical manner. This theory has been criticised for being vague in defining self-actualisation and also assuming that when a person meets all their needs, they are fulfilled (Heylighen, 1992). Hobfoll further identified the social learning theory by Bandura (1977) as the most germane theory to COR theory as it highlights that people actively engage their environment in order to increase the chances of obtaining positive reinforcement. He defined resources as those objects, personal characteristics, conditions, or energies that are valued by the individual or that serve as a means for attainment of these objects, personal characteristics, conditions, or energies.

Hobfoll (2001:352) recognised that the proactive coping theory by Aspinwall and Taylor (1997); and Greenglass, Schwarzer, Jakubiec, Fiksenbaum, and Taubert (1999) are consistent with his COR theory in that stress process is not circumscribed to the reactive response to resource losses or threats. Rather individuals and groups cope by attempting to acquire and maintain their resource reservoirs, acting early when first signs of some impeding problem are evident and positioning themselves in circumstances that fit their resources or otherwise place themselves and their families at an advantage (Hobfoll, 2001:352).

According to the COR theory, people have an innate desire to conserve the quality and quantity of their resources and limit any state that may jeopardise the security of these resources. People strive to develop resource surpluses in order to offset the possibility of future loss. The theory further states that people enrich other resources by investing other resources such as giving aid to relatives. They also employ resources they possess or call on resources available to them such as money, love, time and energy. Von Vacano (2014) pointed out that the COR theory provides a socio-cultural and socio-economic contextualisation of coping processes which is relevant for this study.

The theory has a number of premises which include primacy of loss principle; resource investment; and vulnerability to resource loss. The primacy of loss principle emphasises that acute loss of resources, and not stable poor condition leads to the stress outcomes. According to Zamani, Gorgievski, and Zarafshani (2006), when applied to disaster studies, it can be proven that resource loss resulting from fast-onset disasters appears to account for stress outcomes. This is asserted by a cross-cultural study that was conducted after Hurricane Georges where all types of resource loss were associated with symptoms of acute stress disorder among college students (Sattler, Preston, Kaiser, Olivera, & Schlueter, 2002). The resource

investment premise implies that people must invest resources in order to protect themselves against resource loss, to recover from loss, and to gain resources (Hobfoll & Lilly, 1993). Zamani et al., (2006) identified two coping mechanisms in droughts which are agricultural adjustments and economic adjustments. They further mentioned emotional based coping strategies such as praying and denial which they say are counterproductive.

Hobfoll (2001) posited that those who lack resources are likely to adopt a defensive posture to conserve their resources. Although there are a number of studies that support this stance, Hobfoll cautioned that this was a preliminary corollary as there was need to differentiate between learned helplessness and a resource conserving strategy. Applying this corollary to this study brings questions than closure as the most vulnerable women in Mudzi district continue to rely on rain-fed agriculture despite the successive droughts. The women lack alternatives hence tied to the same survival strategies that continue to deplete their resources. Even though they learn about climate-smart technologies and how to adapt to droughts, little or no effort is given to change on a personal level. Thus, issues of attitudes and perceptions influence behaviour change. The degree of accepting the status quo can be challenged if one perceives themselves differently and has the attitude to change. In the self-efficacy behavioural theory, Bandura (1997) emphasised that self-efficacy perceptions affect how people think, behave, and emotionally react.

The third premise of conservation of resources theory states that those who lack resources are more vulnerable to resource loss, and hence that initial loss begets future loss, resulting in loss spirals. Robertson, Morse, and Baird-Thomas (2009) noted that exposure to multiple traumatic life events can result in cumulative resource depletion and poor adjustment and this can apply to droughts which are under study. The fourth premise states that people who possess more resources are better protected against resource loss, and have a higher chance of resource gain. Kaniasty and Norris (1993)

found that persons with limited financial resources and weak social support networks tend to do worse than those who have stronger social support networks and who can readily replace lost resources.

In view of gender, depending on whether it is men or women in a particular society that possess or lack resources, this can be affirmed as vulnerability or resistance to natural disasters depends on the resources that one possesses, for example, the social assets, financial assets, physical assets or human assets. Therefore, this particular theory was important in identifying resources that exist and see what made women vulnerable to droughts. It is however important to note that in the scenario of Zimbabwe where there are recurring droughts, resources might be difficult to conserve in a long term and even reliance on aid might not be sustainable in the long term due to donor or relationships fatigue.

2.2.2.1. Critique of the Conservation of Resources theory

The conservation of resources theory has its shortcomings and benefits. The COR theory is criticised for listing 74 resources (refer to Appendix 1) only as comprehensive which are more Western and might not be applicable to developing countries. Hobfoll (1998) responded to the criticism by stating that most resources are objective in that resource loss by one individual is also perceived as loss by another yet it is the ranking and the value placed on each resource which is most likely to differ from setting to setting, rather than the actual resources. Therefore, resources are relevant in most cultural settings although more could have been listed especially for African states that dwell on a different set of resources for survival.

Hobfoll (1989) argues that social relations are seen as a resource to the extent that they provide or facilitate the preservation of valued resources, but they can also detract from individual's resources however Adeola (2003) criticised the theory for leaving out social capital. The researcher identifies natural capital as not expounded in the theory yet in African states; the

majority rely on natural resources for their livelihood. People in rural settings engage more with the natural resources that are available to them despite the current state of droughts and floods that is not conducive for most natural resource-based livelihoods.

One can argue that this theory is too simplistic in relation to lacking resources and possessing resources. There are always resources available although the strength or relevance or value of the resources influences the usability of the resources in a setting. Moreover, the notion that possessing more resources makes one better protected from resource loss can be simplistic in that it misses the aspect of diversity. It is not the quantity of resources but the diversity of valuable and relevant resources that enables a community to cope in any disaster.

In the context of Zimbabwe, a series of droughts recur and the COR theory assumes that resources can be protected without glitches yet looking at the frequency of the droughts, it can be challenging to protect these resources. For example, social capital can be fatigued if they give continuously, even donors go through fatigue as resources dwindle especially looking at the world economy that experiences recession and down fall. Investing resources is also a challenge in the context of Zimbabwe where there is a frequency of droughts coupled with economic and political mishaps. It means therefore the context plays a role in the application of this theory.

Despite the shortcomings of the COR theory, the theory cannot be dismissed entirely as it raises important aspects of vulnerability, asset base and coping which are relevant to this study. In addition, the principles are correct and relevant although they need to be strengthened given the different complex contexts. In the next section, the researcher looked at the ecological theory to augment the COR theory.

2.2.3. Ecological theory

James Kelly developed an ecological metaphor in 1968 to understand the interaction between individuals and multiple social systems in which they are embedded. In 1979, Urie Bronfenbrenner developed an ecological systems theory to understand how an individual is influenced by his ecological systems, which contains roles, norms, and rules thereby influencing his development. Kelly is different from Bronfenbrenner in that he looked at how human communities function whereas Bronfenbrenner focused on an individual as a unit of analysis (Bronfenbrenner, 1994). Kelly (1968) acknowledged that the ecological studies are multidisciplinary yet some principles have an empirical basis in field biology which offers a point of departure in studying social environments. Four principles of ecological perspective by Kelly (1968) are interdependence, cycling of resources, adaptation, and succession. Allen, Stelzner, and Wielkiewicz (1999) and Wielkiewicz and Stelzner (2005) adopted and elaborated these principles of ecological perspective in understanding organisational leadership and maintained that individuals need to be understood in their complex, dynamic systems.

In field biology, Smith (1966) summarised the principle of interdependence in an ecosystem as, "…a naturally occurring assemblage of plants and animals that live in the same environment, are mutually sustaining and interdependent, and are constantly fixing, utilising, and dissipating energy. The community depends upon and is influenced by the habitat, and the specific set of conditions that surround organisms." According to Nelson and Prilleltensky (2005), the principle of interdependence asserts that the different parts of an ecosystem are interconnected and that any changes in one part of the system will have ripple effects that impact on other parts of the system. Zamani et al., (2006) stated that disasters are more than an individual event and loss or gain, breakdown or recovery are both individual and community struggles. Subbiah (2000) found that communities in drought-prone areas develop coping strategies as they perceive droughts

to be an integral part of climate variations hence according to Zamani et al., (2006), slow-onset disasters might not elicit an urgent desire for unified communal coping and helping. This is however contextual as communities differ.

Kelly (1968) highlighted that the principle of cycling of resources is a corollary of the first principle and is a direct derivation from the laws of thermodynamics. According to the law of thermodynamics, energy is transferred, neither created nor destroyed; and the transformation of energy assumes a form that cannot be passed on any further. The principle of cycling of resources focuses on the identification, development, and allocation of resources within systems (Nelson & Prilleltensky, 2005). According to Zamani et al., (2006), inter-organisational connections, a community's coping traditions, and social settings qualify as potential resources in a community. They further stated that one can look at the resources available within groups, or societies, the way people adapt to their circumstances or shape their environments, and how that in turn affects group and community resources. Ecological settings consist of person constructs, e.g. ethnicity, gender, beliefs, and attitudes; events, and environments, functional features, e.g. (service delivery processes), as well as the attitudes and values of the community as a whole (Kelly, Ryan, Altman, & Stelzner, 2000).

The principle of adaptation suggests that individuals and systems must cope with and adapt to changing conditions in an ecosystem (Nelson & Prilleltensky, 2005). This principle is derived from Von Lubig's law of minimum and Shelford's later modification of the law of tolerance (Smith, 1966). The law of minimum states that the rate of growth of a plant, the size to which it grows, and its overall health depend on the amount of the scarcest of its essential nutrients that is available to it. On the other hand, the law of tolerance states that the presence and success of an organism depend upon the extent to which a complex set of conditions is satisfied

(e.g. the climatic, topographic, and biological requirements of plants and animals). According to Zamani et al., (2006), an environment is defined in terms of traditions, norms, processes, structures, and policies. There are many strategies that people use in order to cope and some are influenced by social, economic, political, and environmental spheres. Corbett (1988) argued that coping is a distinct component of vulnerability therefore understanding its dynamics is critical in developing adaptation measures that support people as active agents of economic development. Kelly (1968) highlighted that there are two complementary issues that assist in defining adaptive roles in social environments: the relationship between the social settings and the type of adaptive behaviours that develop in such settings; and the type of personality variables that are correlated with adaptive roles. He further identified high exploratory behaviour as significant in adaptation. Exploring the personality variables is an important dimension for further studies in the adaptation to droughts.

Kelly (1968) noted that in field biology, the principle of succession assumes that there is a gradual and continuous replacement of one kind of plant and animal by another, until the community itself is replaced by another that is more complex. In addition, Kelly (1968) pointed that as natural environments receive greater and greater modification; the succession process is altered, affecting the composition and even the functions of communities. The principle of succession involves a long term time perspective and draws attention to the historical context of a problem and the need for planning for a preferred future (Nelson & Prilleltensky, 2005). Reenberg, Birch-Thomsen, Mertz, Fog, and Christiansen (2008) found that households in the Solomon Islands placed decreasing importance to agriculture and fishing, yet persisted with gardening which is increasingly supplemented by other income-generating activities such as shop-keeping, private business, and government employment. This particular case study points to a realisation that agriculture in itself is not sustainable given the increasing climate variability hence need to adapt for a preferred future.

People develop a disaster subculture which includes beliefs, knowledge, technology, norms, values, and survival activities of the local community before, during, and after disaster periods. Although people might develop strategies to cope in a long term, this does not explain why people in countries such as Zimbabwe where droughts recur after every two to three years are still vulnerable, especially the marginalised groups.

Kelly and Trickett expanded the four principles of the ecological perspectives to include their implications for preventive interventions (Kelly, 1986) and the conduct of research (Trickett, Kelly, & Vincent, 1983). They highlighted that research needs to be conducted in a much collaborative, participatory manner through working with people rather than working on people. Trickett (1986) further stated that attempts to solve a problem may lead to new problems in another context and these are usually unanticipated. In light of drought and women, many interventions are proposed and implemented in communities yet new problems such as power dynamics and dependence occur. Issues of targeting arise as the most vulnerable women might not access the interventions effectively as a result of bias and domination.

On the other hand, Trickett (1986) pointed that the interventionists need to form constructive working relationships with different partners in the host setting; and be able to know the setting and people within it; help the setting to mobilise resources from within or to identify external resources. Stakeholders working in communities need to understand the dynamics of communities in which they work in and also understand their personal and professional attributes that might impede the development of a community. Furthermore, Trickett (1986) noted that issues and problems need to be considered at multiple levels of analysis and over a long-term perspective.

2.2.3.1. Critique of Ecological theory

According to Nelson and Prilleltensky (2005), the ecological metaphor has value in providing a systemic and holistic perspective for the understanding of human experience and behaviour and it has led to the development of different ways of understanding and assessing human environments. However, a gap is found in the application on larger social structures. Moreover, the theory disconnects an individual from himself and places him in a social setting yet an individual can make decisions that are detrimental.

In addition, the theory does not acknowledge the existing power relations in an ecosystem. Nelson and Prilleltensky (2005) highlighted that it should be recognized that some players have more power than others in any eco-system. Trickett (1994) noted that the ecological metaphor needs to be complemented with the concept of power. Given the cultural context of Mudzi, power issues cannot be ignored as they contribute to the social structure. Moreover, gender relations need to be acknowledged when trying to understand social phenomena in the district.

It can be argued that planning for a preferred future is too simplistic when one looks at Zimbabwe that has a history of sudden social, economic and political changes that affect livelihoods hence it is difficult to plan under such conditions. The theory makes assumptions, which is problematic given the reality that Zimbabwe faces. Understanding the Mudzi context and how different elements play reinforces the theory.

2.2.4. Rationale for utilising Conservation of Resources theory and Ecological theory

Although the two theories were developed at different times, an element of coping cuts across both theories yet it is explicit in the ecological theory as the emphasis is put on interdependence, adaptation and succession. However, the elements of adaptation and coping were refined in the COR

theory by bringing the importance of resource investment at different intervals of disasters. These principles were translated into practical actions by trying to understand how women in Mudzi district were coping with and adapting to droughts. In addition, the importance of resources appears more explicitly in the COR theory and in reference to this study, resources were compared to livelihoods. The cycling of resources premise in the ecological theory has to be understood in a system, yet an individual can migrate in order to build their livelihood. Thus, the two theories can complement each other in understanding coping, adaptation, and livelihoods from different angles.

The issue of vulnerability is missing from the ecological theory yet it is addressed in the COR theory. Although the power relations are not discussed explicitly in the COR theory, it is evident that those who lack resources suffer losses yet those who possess more resources are better protected. For one to possess resources, the issue of power is not eliminated. In Charles Darwin's theory of natural selection (Darwin, 1869), he adopted the term "survival of the fittest" hence it can be deduced that power influences one's vulnerability or resilience and this also applies to gender relations.

Both theories are relevant in looking at the vulnerability of women to droughts. Although they have shortcomings, the two theories complement each other in this study. The intrinsic formulation of the two theories is sound enough as it brings dimensions that are important for this study however, they have limits when confronting the reality. They are many assumptions that shadow the underlying meaning of the theories and they ignore the contribution of behaviourism at both individual and institutional level which is central to this study. The researcher utilised the COR theory as the primary theory because of the concept of vulnerability and livelihoods which were core to this study. The ecological theory is the complementary one because of the coping and adaptation concepts that are integrated in this

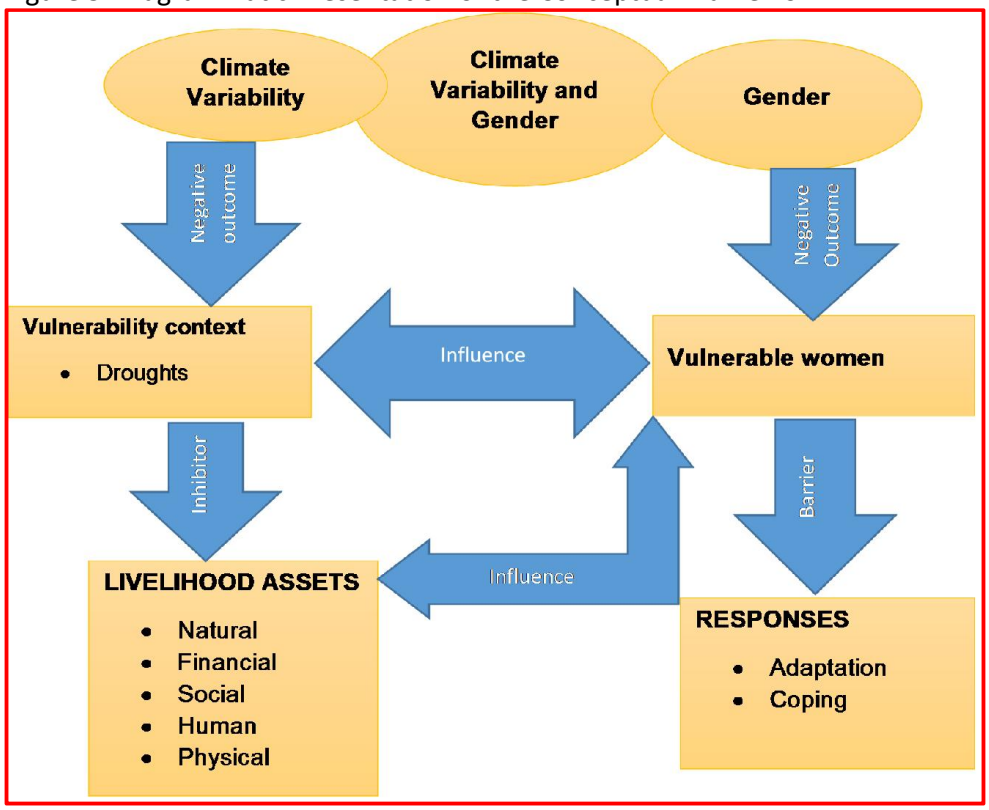
study. The concepts are discussed in the next section utilising the sustainable livelihoods framework.

2.3. Conceptual Framework

2.3.1. Understanding Sustainable Livelihoods Framework

The conservation of resources theory and ecological theory provided the theoretical perspective of understanding the vulnerability of women to droughts and in order to complement these theories, this section focused on the sustainable livelihoods framework which reflected on the key concepts relevant to this study. Scoones (1998) and Serrat (2008) in their attempt to define sustainable livelihoods stated that a livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base.

Figure 5: Diagrammatic Presentation of the Conceptual Framework



Source: Adapted from the Sustainable Livelihoods Framework (Scoones, 1998)

The researcher adopted the sustainable livelihoods framework in understanding the vulnerability of women to droughts which are termed as shocks in the framework. The framework is important for this study as it focuses on capital assets which were adopted to analyse the vulnerability of women to droughts. In the framework, there are issues of shocks and stresses which are applicable to droughts that are being studied in this context. In addition, the issue of livelihood strategies is in the framework which was the main focus of this study to understand women and their livelihoods in relation to droughts. According to Morse and McNamara (2013), the more diverse livelihood base there is, the more sustainable as shocks to one or more components can be compensated for by an enhancement of others. However, this is a simplistic assumption as the value and ranking of the livelihood makes it important in a setting. The different concepts were looked at, as reflected in the adapted Sustainable Livelihood Framework in Figure 5. The framework was adjusted to contextualise this study with the addition of the elements of climate variability and gender.

2.3.1.1. Climate variability and gender

The concept of climate variability defines the trajectory of this study with particular attention to droughts. Droughts are the vulnerability context which is also known as shocks or stresses as illustrated in Figure 6. According to Zhang, Rockmore, and Chamberlin (2007), vulnerability broadly reflects three components which are: (1) the sources of risk (shocks); (2) the response of households and communities; (3) the outcome. Similarly, Adger (2006) conceptualises vulnerability as being constituted by components that include exposure and sensitivity to perturbations or external stresses, and the capacity to adapt. Cutter (1996) further identified variables that are related to exposure which are: proximity to the source of threat, incident frequency or probability, magnitude, duration or spatial impact. In understanding the element of climate variability, gender was incorporated

in the study but limited to women only. In this study, the droughts posed stresses to the livelihoods of women which made them vulnerable as their responses were weak or negative.

Figure 5 shows the intersection between climate variability and gender which forms the basis of this research. Climate variability has a bearing on gender and the effects of climate variability affect women and men in different ways. In criticising the sustainable livelihoods framework, Krantz (2001) noted that the framework does not discuss the social dominance and power within the communities; for example, issues of gender are not really addressed in relation to the appropriate time and space to women. Moreover, the COR theory and ecological theory are silent about social dominance and power relations within communities yet the COR theory highlights the issue of vulnerability by stating that those who lack resources are more vulnerable to resource loss and those who have more resources are better protected from resource loss. Gender plays a role in resource possession and vulnerability thereof. Hence, by adding an element of gender and climate variability, this contextualises the study to drought issues and delves into the social dominance and power struggles in Mudzi communities between men and women.

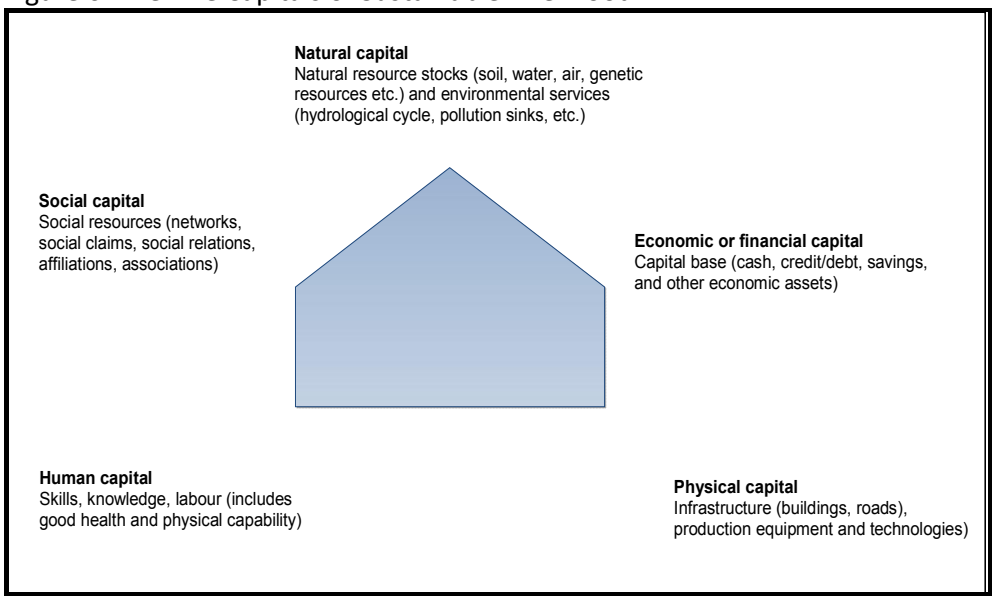
2.3.1.2. Capital assets

According to Krantz (2001), capital assets refer to a variety of resources which are often in combination that people rely on to make a living. The COR theory points that those who lack resources are more vulnerable to resource loss, and hence that initial loss begets future loss, resulting in loss spirals. It is therefore important to look at the capital assets from the sustainable livelihoods framework as they are more appropriate given the developing African context which values natural resources which is the pinnacle of the pentagon representing the five types of capital assets. There are five types of capital assets in the sustainable livelihoods framework which are natural capital, social capital, economic capital, human capital

and physical capital as reflected in Figure 5. Flora, Flora, and Fey (2004) expanded the capital assets in their community capitals framework and identified natural capital, social capital, financial capital, human capital, political capital, built capital, and cultural capital as important in the quest to have vibrant communities.

It should be noted though that the capitals identified by Flora et al., (2004) are an expansion of the sustainable livelihoods framework capital assets which brings out issues of culture, politics, and infrastructure which can stem from the former framework. In rural areas, many women rely on natural assets for their livelihoods. However, this is contextual as found by Segnestam (2008) in her study on the impacts of droughts in Nicaragua. As Krantz (2001) explained that capitals assets are often in combination, different assets were affected by droughts in Mudzi district and the women interviewed had different ways of coping with and adapting to the effects of successive droughts. Below is a diagrammatic presentation of the capital assets adapted from Scoones (1998):

Figure 6: The Five Capitals of Sustainable Livelihood



Source: Scoones (1998)

Different pentagons are drawn for different social groups or communities to reflect the value placed on each capital asset. Moreover, the shape of the pentagon is always changing depending on the community. For instance, if a community is shifting from natural resources as found in the study by Reenberg et al., (2008) and moving towards shop-keeping which is an economic asset, the pentagon changes the shape to reflect this. According to the United Kingdom Department for International Development (DFID) (1999), a single asset can generate multiple benefits for example, if a community has human capital; that can also translate to economic capital as income can be generated through the use of skills and knowledge.

When the research was being designed, the researcher placed more importance on the natural capital, economic and social capital in understanding the livelihood strategies women employ in Mudzi. However, human and physical capitals were also looked at as they contribute to the understanding of droughts yet were not considered as more important. It was found though in this study that human capital played a big role in responding to droughts as the skills, knowledge and labour provided an asset base for the households as discussed in the analysis of the data.

2.3.1.3. Coping and adaptation

In various studies on disasters, the issues of coping and adaptation are contextual and vary from one community to another. According to the ecological theory, the principle of adaptation suggests that individuals and systems must cope with and adapt to changing conditions in an ecosystem. In addition, the theory calls for succession which involves a long-term time perspective and draws attention to the historical context of a problem and the need for planning for a preferred future. Therefore, the researcher looked at the coping mechanisms and adaptation strategies that women utilise in order to protect themselves from the negative effects of droughts on their livelihoods. Given the successive droughts that occur in Zimbabwe, it was significant to bring out how sustainable the coping mechanisms and

adaptation strategies are. As highlighted in the critique of the ecological theory, planning for a preferred future in the context of Zimbabwe is problematic given the rapid changes that occur as they counter people's expectations and plans.

According to the World Health Organisation (1998), there are three different types of coping which are: non-erosive, erosive and failed coping. Non-erosive coping refers to insurance, risk-minimising and loss management e.g. reduction in dietary intake, use of cheaper foods, sale of non-productive assets. Erosive coping refers to disposal of disposable assets, for example, shark loans, sale of large livestock, land and tools. Lastly, failed coping is a form of destitution such as dependency on charity, out-migration, prostitution and so forth. The COR theory states that people must invest resources in order to protect themselves against resource loss, to recover from loss, and to gain resources. Coping is short term whereas adaptation is a long term response which is capable of enabling people to recover from loss and gain resources. Men and women have different ways of responding to disasters hence there was need to ascertain how women select their coping mechanisms and adaptation strategies. The coping mechanisms and adaptation strategies expose the complexities that are embedded in communities; and they can also be complex thereby contributing to the vulnerability of women to droughts. Thus, it is important for this study to unpack the complexities of the different responses to droughts in order to understand the vulnerability of women to droughts in Mudzi district.

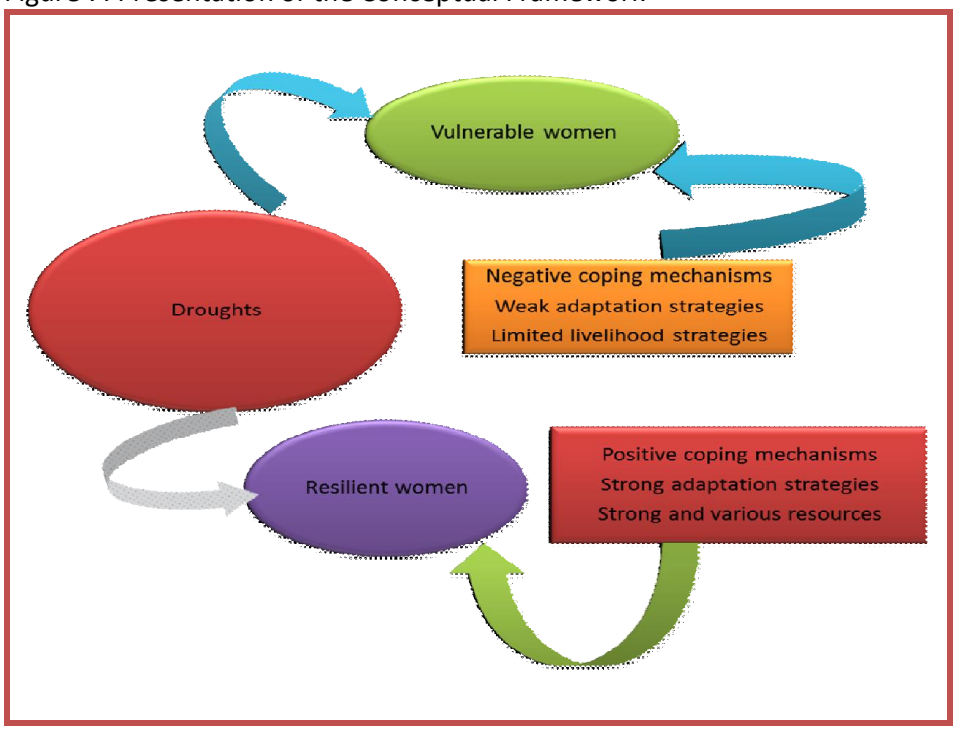
2.3.2. Application of the key concepts

Figure 7 illustrates the diagrammatic presentation of the key concepts for this study which are vulnerability, coping and adaptation, livelihood strategies (resources), and the element of gender with an inclination on women. In the application of the COR theory, people have an innate and a desire to conserve the quality and quantity of their resources and limit any state that may jeopardise the security of these resources. However, given

the social limitations and the environmental context, it is not always possible to protect and retain the resources yet in an ideal world; this can create a positive outlook. Droughts negatively affect the most vulnerable groups of a society and women bear the brunt of droughts in most of the communities.

The COR theory states that people must invest resources in order to protect themselves from future losses, consequently those who lack resources are more vulnerable to resource loss, and hence that initial loss begets future loss, resulting in loss spirals. The arid and semi-arid areas of Zimbabwe are hit by droughts year in and year out hence the different capital assets might have been diminished or exhausted which results in more vulnerability. Different coping mechanisms and adaptation strategies might have been applied in different contexts but given the socio-economic, political, and environmental context, this can be challenging hence creating spirals of vulnerability.

Figure 7: Presentation of the Conceptual Framework



Source: Own (2018)

Figure 7 shows that droughts either contribute to women's vulnerability or resilience to droughts depending on the context. The combination of positive coping mechanisms, strong adaptation strategies and various, strong resources are essential for women to be more resilient to droughts. These three elements cannot be applied in isolation or be considered independent of each other. On the other hand, the combination of negative coping mechanisms, weak adaptation strategies, and limited livelihood strategies contribute to the vulnerability of women to droughts.

Studies by Bola et al., (2013); Mutasa (2010); Ndlovu (2011); and Zvikomborero and Chigora (2010) identified different coping mechanisms that were being practised in Zimbabwe such as selling livestock, gathering wild fruit, change of diet and food consumption, reliance on food aid, migration, social networks, and reliance on remittances. However, there was a gap in implementing adaptation strategies; instead the communities believed that strategies such as planting drought tolerant crops, establishing cooperatives for digging wells, diversification of incomes, poultry keeping, and grain storage could assist them to adapt well in times of droughts. These were merely suggestions and without application they could not be substantiated as really effective as adaptation strategies in the Zimbabwean context. The environment in which the adaptation strategies are practised is equally important as it contributes to the success of the strategies.

The strong inclination on natural livelihoods as an adaptation measure remains embedded in the communities yet history has shown that Zimbabwe is susceptible to successive droughts. There is therefore a need to vary viable livelihoods and move towards adaptation strategies that are more effective. Having diverse and viable livelihoods that can withstand droughts enable women to focus their attention on what generates income without massive losses resulting from natural effects. Strong adaptation strategies cushion women from continuously falling prey to droughts that

result in a cycle of vulnerability. The negative factors illustrated in Figure 7 combined with the socio-economic and political context are a battleground for the continuous vulnerability of women to droughts.

2.4. Conceptualisation of the research process

Table 5 shows linkages of the problem statement, purpose statement, research questions, literature review, theoretical framework, conceptual framework and research methodology. There is a transition from the problem statement to the research methodology on the specific concepts that are central to this study which are: coping mechanisms, adaptation strategies, livelihood strategies and the vulnerability of women to droughts. Table 5 gives a snapshot of what to expect from different stages of the design of this study thereby mapping the different concepts logically.

Table 5: Conceptualisation of the Research Process

Problem Statement	Purpose	Research Questions	Literature Review	Conceptual/Theoretical framework	Research Methodology
Despite the recurrence of droughts, women in Mudzi district continue to rely on rain-fed agriculture and natural livelihoods which poses challenges on their livelihoods	The researcher explored how different livelihoods are affected.	How are droughts affecting the livelihoods of women in Mudzi district	Discuss the impact of droughts on livelihoods in other contexts and analyse the similarities and differences	The sustainable livelihoods framework lists 5 capital assets - social, economic, natural, financial and human. The conservation of resources theory states that those who lack resources are more vulnerable to resource loss and those who possess more resources are better protected against resource loss.	Semi-structured interviews, documents review and observations were used to explore the livelihoods that women possess in Mudzi District.
Although there are coping mechanisms and adaptation strategies in many communities, this does not make women more resilient to droughts as evidenced by the continuous reliance on food assistance from international organisations	The study provided understandings on latent coping and adaptation strategies in Mudzi District.	How are rural women in Mudzi district coping with and adapting to droughts?	Discuss coping and adaptation mechanisms of rural women Discuss the gaps in Disaster Risk Reduction Policies	The ecological theory has a principle of adaptation which suggests that individuals and systems must cope and adapt to changing conditions in an ecosystem. The theory also has a principle of succession which draws on the historical context and the need to plan for a preferred future.	The researcher utilised semi-structured interviews, documents review and made observations to understand how the women in Mudzi are coping and adapting to droughts.
Although there are successive droughts in Zimbabwe, literature relevant to Zimbabwe that focuses on the vulnerability of women is limited. Similar studies miss the disaggregation of data by gender.	The purpose of this study was to explain why women are vulnerable to droughts in Mudzi District	Why are women vulnerable to droughts in Mudzi district?	Discuss the reasons for women's vulnerability to droughts in other contexts Understand climate variability and gender issues	The conservation of resources theory states that those who lack resources are more vulnerable to resource loss. The sustainable livelihoods framework was adapted to reflect on the vulnerability of women to droughts	Semi-structured interviews, documents review and observations were utilised to understand the issues of women's vulnerability

Source: Own (2018)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

Krauss (2005) claimed that philosophical assumptions or theoretical paradigms about the nature of reality are important in understanding the overall perspective in which a study is designed and carried out. There are different philosophical approaches used to understand social reality and these assist in informing research techniques. Mouton (2001) identified five approaches namely positivism, realism, postmodernism, critical theory and phenomenology. However, Neuman (2011) identified three main approaches namely positivism, interpretivism and critical social science; and further added post-modernism and feminism. Phenomenological paradigm is also called interpretive paradigm hence Blanche, Durrheim, and Painter (2006:276) cited that "understanding human phenomena in context, as they are lived, using context-driven terms and categories, is at the heart of interpretive research."

In the studies that the researcher looked at, that focused on gender and droughts, none of the researchers overtly aligned themselves with a particular philosophical paradigm. However, they used qualitative methods in understanding the relationships between droughts and gender through in-depth interviews (Wawire, 2003), semi-structured interviews (Segnestan, 2008; Stehlik et al., 2000), focus group discussions (Segnestan, 2008) and observation (Segnestan, 2008; Wawire, 2003). Molua (2012) and Sahu (2013) utilised questionnaires, which is a quantitative method to collect data. For this study, the research utilised the interpretivism paradigm to understand the vulnerability of women to droughts by interpreting the contribution of coping mechanisms, adaptation strategies and livelihood strategies employed in the context of Mudzi district. The findings were interpreted in this context, hence significant in similar contexts.

3.1.1. Approach of the research

In this study, qualitative methods were utilised in obtaining data in order to study the issues in-depth and have open conversations that are detailed. A qualitative approach was appropriate for this study as there was need to immerse in great narrative detail to understand the vulnerability of women to droughts through analysing and interpreting the values, beliefs, and assumptions which were constructed by the women. The qualitative researcher usually expresses an interest in understanding the social world from the point of view of the participants in it and emphasizes the context in which events occur and have meaning (Letts, Wilkins, Law, Stewart, Bosch, and Westmorland, 2007). Atieno (2009) highlighted that qualitative research is interpretative in nature; and that it requires detailed observation and explanation, thus its conclusion takes both general and unique factors. The uniqueness of qualitative research is in the details that are context-specific.

This study intended to construct new theoretical interpretations in understanding the vulnerability of women to droughts. The analysis of the qualitative data not only confirmed the theories utilised but also expanded the theories thereby creating a different understanding of droughts from a different perspective. The methods selected for this study were interviews, observation and documents review. Firstly, the community members were interviewed using the interview guide in Appendix 6 and the government officials and NGO staff were interviewed using the interview schedules in Appendix 6. In order to validate the data collected, the topography was observed using the Observation Guide in Appendix 7. Lastly, the Documents Review guide in Appendix 8 was utilised to review a number of vulnerability assessment reports; crops and livestock assessment reports; poverty, vulnerability and climate-related reports; government and NGO reports.

Primary data was collected from the key informants from the communities, NGO and government officials and secondary data was collected from the

documents that informed the climatic history of Mudzi district and the current trends. Since this was a qualitative study, data was collected in textual format. A single case study of women living in Mudzi District was utilised to answer the research questions; to delve into the social interactions in line with the vulnerability of women to droughts and to understand the issues in context.

3.1.2. Utilisation of a case study for the research design

This study focused on a single case and there were two levels in which the data was collected. The unit of observation was the rural women in Mudzi district who were vulnerable to droughts and had been registered to benefit from food assistance. However, the unit of analysis was the household in which the women represented. There were multiple levels of analysis on this single case, which gave a deeper, contextual understanding of this group within the households they represented. The study was confined or bounded to women who had lived in Mudzi district for over 10 years and had experienced droughts that had occurred since 2000.

Yin (2009) identified three scenarios when a case study is relevant for use: (i) “how” and “why” questions are posed; (ii) the investigator has little control of events, and (iii) the focus is on contemporary phenomenon within a real-life context. In this study, the intention was to explain why women in Mudzi district are vulnerable to droughts despite the employment of various coping mechanisms and adaptation strategies; and how their livelihoods are affected by droughts. There was no control of events that occurred in Mudzi district and droughts are a contemporary phenomenon which has received attention due to climate variability among scholars. It was through the understanding of gender dynamics in Mudzi District that drought was interpreted and the voices of women were captured without excluding the validation of their experiences through including men, government officials and NGO employees in the study.

Merriam (1998) pointed that case studies can be interpretive and contain rich, thick description which can be used to develop conceptual categories or to illustrate, support or challenge theoretical assumptions held prior to the data gathering. The researcher employed the conservation of resources theory and the ecological theory in understanding the influence of droughts on women. The case study assisted in qualifying the COR theory that states that those without resources are vulnerable and those who have resources are better protected. It was through this theory that different livelihood strategies were identified. Drawing from the principles of the ecological theory, the case study looked at issues of coping with and adapting to droughts within the context of Mudzi.

Although case studies have a number of strengths, they are clouded with some limitations which should be acknowledged and dealt with. Yin (2009) highlighted that cases are not “sampling units” therefore the results cannot be generalised unless two or more cases are shown to support the theory. The method of generalisation is “analytic generalisation” in which a previously developed theory is used as a template with which to compare the empirical results of the case study. There can be a single case that can confirm, challenge or extend a theory which can be used to determine whether a theory’s propositions are correct or need an alternative set of explanations (Yin, 1994).

This study utilised the conservation of resources theory and ecological theory which assisted in analysing assets that the women owned, their livelihood strategies, coping mechanisms and adaptation strategies. The premise in the conservation of resources theory of investing more resources in order to gain more resources was challenged as this needed to be qualified and contextualised. On the other hand, the succession premise in the ecological theory was also challenged as the issues of attitudes and perceptions played a role in behavioural change. Having a long-term perspective of droughts and understanding the historical context of the problem did not always trigger the women to plan for a preferred future. The

replication of this study should, therefore, be in line with the understanding of the theories utilised and how they can be interpreted in similar contexts.

Guba and Lincoln (1981) noted that case studies can oversimplify or exaggerate a situation, leading the reader to erroneous conclusions about the actual state of affairs. Moreover, qualitative case studies are limited by the sensitivity and integrity of the investigator as he or she is left to rely on his or her own instincts and abilities throughout most of the research process (Merriam, 1998). Issues of bias, ethics, reliability, and validity pose further limitations (Johnson, 1994; Merriam, 1998). These limitations were dealt with through identifying ethical issues and responding to them thereby ensuring that the study meets the ethical standards. Moreover, issues of validity and reliability were discussed in depth in order to tackle issues of credibility, transferability, dependability, and confirmability.

Yin (2009) identified interviews, direct observation, documentation, participant-observation and so forth as different data collection techniques that can be used in data collection and pointed that various sources are complementary hence need to use a number of techniques in order to attain a good case study. The study utilised interviews, observation, and documents review as research techniques for this case study. This study utilised data from a defined number of women, men, government and NGO officials through interviews and this was enriched with data collected through observation and documents review. Thus, there was convergence of evidence from the multi-layers of data from the respondents, observation, and document review which enabled the case to be strengthened by understanding various angles of the study.

3.1.2.1. Research site

Initially, the research was supposed to be undertaken in Giyani district of South Africa but due to non-cooperation of the main contact, Mt Darwin district of Zimbabwe was suggested as an option by the World Vision Operations Manager. After establishing a relationship with a contact in Mt

Darwin district, the contact disappeared and could not respond to any communications, thus a third alternative was sought. The Candidate had a good working relationship with the Programme Manager of World Vision in the Mudzi district, hence it was easy to be linked to the local authorities through the Field Officers to seek for permission to undertake the study, which addressed the accessibility issues. After careful examination and overcoming the accessibility barriers, Mudzi district was selected based on the agro-ecological characteristics that are similar to the first two options, which present a drought-prone area, with very high temperatures, low rainfall patterns and poor soils. Mudzi district was equally a good substitute for the research because out of the 52 districts in Zimbabwe, it is one of the few districts in Mashonaland that falls in the agro-ecological zone 4, where it is semi-arid with recurrent droughts. There is a high likelihood of the district to move to agro-ecological zone 5, which has poor soils and highly erratic rainfall thus not suitable for crop production as already claimed by authors such as Kawadza (2014) due to the harsh climatic conditions in that area.

The researcher accessed the district through World Vision that operates in the area. The Candidate had a good working relationship with the Programme Manager of World Vision in the district; hence it was easy to be linked to the local authorities through the Field Officers to seek permission to undertake the study, which addressed the accessibility issues. Moreover, to avoid language barriers, an area in Mashonaland was more conducive for the researcher than one in Matabeleland province, where the researcher needed an interpreter to understand the research participants. Furthermore, the population in the district had been selected for food assistance as it had been hard-hit by drought and remained vulnerable due to the recurrent droughts. Thus, studying this population was in line with the criteria of the selection of research participants thereby fit to inform the research questions. There was no known similar study conducted in Mudzi district hence this brought a new appreciation of the site in light of the recurrent droughts thereby unfolding the contextual issues around the vulnerability of women to droughts. In addition to the accessibility of the site, I chose Mudzi

communities because in spite of living in a semi-arid area prone to recurrent droughts, they perpetually practised rain-fed agriculture. Therefore, this research site provided a unique ground for understanding women's vulnerability to droughts in an unconducive environment with no or little support for sustainable agriculture. Their responses foreground the need to study behaviour change in drought management. The research was undertaken in two out of 17 wards were selected to inform the research, that is, Chimukoko ward 3 and Suswe ward 7. The wards that were selected were the worst hit by droughts and were prioritised in the food assistance projects due to the levels of vulnerability. Although two wards were selected for the interviews, three other wards (Goronga, Chikwizo and Nyamukoho) were visited in the district in which the topography was observed to validate the extent of droughts in the district. Informal conversations were made with women in the other three wards to establish their source of income and how they were coping during droughts.

3.1.2.2. Research process

When the researcher started her research work, she assumed that since she worked for World Vision, it would be easy to collect data in the field where they operated in. She learnt that there were protocols that had to be observed and that it was not easy to obtain permission. She learnt to adapt to complete the data collection process as narrated in this section. The District Administration (DA) office was approached to request for permission to collect data in the area. The DA cited that he was not comfortable giving permission to undertake the research as the researcher was from a foreign university and he did not know how the research would be interpreted especially given the political environment. Since she was on a work mission to undertake monitoring and evaluation activities in the district, the DA recommended that she collected data concurrently when she sampled women and men for the work activities. She was fully involved in selecting the respondents and adhered to the criteria of selecting them.

Women and men at project sites who were benefitting from the Cash-for-Work project who were considered to be the most vulnerable in the communities were selected to inform the research. The women and men that were interviewed had stayed in Mudzi district for over 10 years and the majority had been born in the district hence understood issues of climatic patterns in the area. Eight of the respondents' homesteads were visited, which assisted in making some observations. The observations were utilised in connecting the data that was emerging from the interviews. However, the general topography of the areas that were visited informed most of the observations made. There was a research assistant who also assisted in collecting the data in this study and was familiar with the community as he had been working in the district. Interviews constituted the bulk of the data collected, followed by document review and observations, these were limited due to the restrictions that were made by the District Administrator not to interact with communities overtly as there was political sensitivity.

The Candidate was faced with challenges in accessing research sites and even when she had her foot on a research site, political barriers made her find new ways of accessing data through enhancing interaction and build trust with the different players on the ground. The timing of interviews after a major shake-up in the ruling party due to internal debacles infiltrated suspicions of any person entering the districts thus invited huge scrutiny before undertaking any project. This resulted in cautious and expedited interviewing of communities in order to accomplish the objectives within a given time-frame for fear of hindrances and barring before completing data collection. This interactive process in overall constituted an interesting learning in sourcing research evidence in difficult conditions which benefitted the research outcome.

3.2. Data Collection Strategy

This section focuses on how data was collected and some of the advantages and disadvantages of these methods are discussed in context of this research.

3.2.1. Interviews

Ritchie and Lewis (2003) highlighted that in-depth interviews are important where delicate or complex issues need to be explored at a detailed level and that it focuses on an individual's personal perspective in his or her context. For this study, issues pertaining to the vulnerability of women were explained thus there was need to understand the issues from women's perspective and also demystify the social relations between men and women in the Mudzi context. Segnestam (2008) in her study in Nicaragua found that women were more vulnerable to droughts due to their limited access to assets, decision-making power, and freedom of choice. This might be contextual therefore there was need to interview people in a different setting and establish their vulnerability. Maree (2007) noted that an interview aims to obtain rich descriptive data that can assist in understanding the participant's construction of knowledge and social reality.

In this research, semi-structured interviews were conducted because the line of inquiry was defined hence the interviews were guided. Longhurst (2003) highlighted that although semi-structured interviews have predetermined questions, they unfold in a conversational way hence other issues are explored. The research's purpose was for the participants to follow a trajectory on the issues of women's vulnerability, livelihoods, and coping mechanisms hence semi-structured interviews were ideal to keep the participants focused yet open to other interesting and relevant subjects that arose. Cohen and Crabtree (2006) claimed that semi-structured interviews can provide reliable, comparative qualitative data. Therefore, by undertaking semi-structured interviews in Appendix 6, the research was

able to compare emerging issues from different participants in an organised manner.

The purpose of the study was explained to the respondents and permission was sought to record the interviews. None of the respondents declined to be recorded hence the interviews were all recorded and notes were taken down. The assistant researcher took down notes on all the interviews he made with the respondents. Government officials and NGO staff were supposed to be interviewed face to face but could not all be interviewed during the researcher's trip to Mudzi due to non-availability and time constraints. Since the researcher had semi-structured interview schedules that were detailed, this assisted in obtaining all the data required. She therefore left the some structured interview schedules for the officials and requested the research assistant to interview them. The research assistant followed up the respondents and sent the completed schedules via email. Where there were some unclear issues, the researcher followed up to clarify. It was problematic though as the recordings were not in-depth in some schedules.

3.2.2. Observation

Maree (2007) describes observation as a systematic process of recording the behavioural patterns of participants, objects and occurrences without necessarily questioning or communicating with them. Observation is used to gain a deeper insight and understanding of the phenomenon being observed. According to Villaseñor, López, and Arguilaga (2003), the procedural structures in observational designs focuses on the spontaneous behaviour of an individual, requiring the maximum display of naturality in the context where the study is taking place. Kawulich (2005) pointed that the observation method provides opportunities for viewing or participating in unscheduled events and it affords one access to "backstage culture." On the other hand, DeWalt and DeWalt (2002), noted that in observation, male and female researchers have access to different information, as they have

access to different people, settings, and bodies of knowledge therefore should be aware of this limitation when trying to access data.

In observing the physical effects of droughts, this method was ideal as it gives the researcher an outlook that is not biased as this was a natural setting. Photographs of the topography were taken and of particular importance was the evidence of soil erosion, nature of the pastoral land, the health of the livestock, the state of the farming land, the soil structure, available water sources, various livelihood strategies, and conservation farming. The observed topography addressed the question on the contribution of droughts to the livelihoods of women.

In addition, interactions of men and women were observed to understand the relationships that exist within households when the researcher was collecting data using the interview method. The researcher observed how women in Mudzi were coping or adapting to droughts by looking at the different activities they were involved in. A clear set guideline of the phenomena that were under observation was articulated in Appendix 7. The checklist was based on the different areas as guided by the research questions. Kawulich (2005) pointed that in cases whereby the researcher cannot question participants, structured field notes can be recorded based on his or her observations. These notes are part of the data that can be analysed, based on the outline developed. Similarly, the Research Connections (2016) highlighted that the researcher can detail behaviors, conversations, or setting characteristics in developing field notes. The University of Southern California (2017) advised that field notes in observation should be organised strictly chronologically or according to specific prompts; and should focus on the research problem. One disadvantage of observation is that it is highly selective and subjective however for this study, a mixture of methods assisted in overcoming this disadvantage.

3.2.3. Documents review

Bowen (2009:30) noted that "documents provide background and context, additional questions to be asked, supplementary data, a means of tracking change and development, and verification of findings from other data sources". In order to understand the droughts' trends in Mudzi, the researcher used secondary data sources as a data gathering technique and the list of documents that were reviewed are in Appendix 8. According to the World Bank Institute Evaluation Group (2007), one has to develop a list of characteristics of the documents that one desires to review; list potential resources for attaining the information; and develop a checklist that can be systematically used by the reviewer to identify, analyse, code and document the information. Bowen (2009) pointed that the reviewer needs to code and categorise the data from the documents reviewed, based on data's characteristics, to uncover themes pertinent to the study. Similarly, Triad 3 (2016) indicated that the researcher determines the trajectory of the documents to be researched, documents, and organizes the data based on the checklist developed. The research questions guided the researcher on what to include in the development of the list. After reading various reports, the researcher selected relevant materials that were aligned to the research questions and built data based on that. A list of Zimbabwe Vulnerability Assessment Committee Rural Livelihoods (ZIMVAC) reports and Crop and Livestock Assessment reports from 2002 to 2015 were reviewed. The research utilised Mudzi reports from World Vision, and the Department of Women Affairs, Gender and Development in understanding how the women in the community were being assisted to cope with droughts and understand the gender dynamics.

According to Johnson and Turner (2003), documents are often reliable and valid and often give confirmation to the trend that is being researched. Therefore the research sought to establish some patterns that emerged from the data collected through interviews and observation by understanding what had been documented regarding droughts in Mudzi. A

number of patterns that emerged from the documents could be connected to what emerged from the interviews and observation methods for instance, on the state of food security, livestock situation, casual labour, petty trade, and so forth. However, there were some issues that surfaced from the documents that could not be established on the ground, for example, the existence and functionality of irrigation systems. Documents review as a method of data collection is criticised for time consuming, incomplete or inaccuracy of information and could be biased because of selective survival of information (Center for Disease Control and Prevention, 2009; McNamara, 2008).

3.2.4. Rationale for integration of data collection instruments

The utilisation of interviews, observation method and documents review was meant to validate the data that was collected within this case. Yin (2009) noted that the utilisation of multiple sources of evidence allows for a converging line of inquiry hence any finding in the case study is likely to be much more convincing and accurate. These tools complemented each other as the weakness of one tool was the strength of another hence this assists in making a good case study.

3.3. Sampling Design

This section focuses on how participants were sampled and the limitations of the selected method of sampling. Blanche et al., (2006) noted that sampling in qualitative research is different from quantitative research in that it has smaller, less randomly selected cases yet quantitative research requires a representative of a larger population. He further alluded that different sampling concerns and procedures are applied in interpretive research. Neuman (2011) concurred with Blanche et al., (2006) and further cited that a few cases are picked to provide clarity, insight, and understanding about issues or relationships.

3.3.1. Classes of sampling

There are two main classes of sampling methods: probability and non-probability sampling. Probability sampling methods are based on the principles of randomness and there are objective mechanisms used in the selection procedure and these include cluster, simple random, stratified and systematic sampling. Non-probability sampling methods do not make use of random selection of populations (Maree, 2007:176). Neuman (2011) identified eight types of non-probability sampling which are: convenience, quota, purposive, snowballing, deviant case, sequential, theoretical, and adaptive. All these can be used depending on the data to be collected.

For this study, purposive sampling was utilised for the selection of participants. Maree (2007) described purposive sampling as when participants are selected because of some defining characteristic that makes them the holders of the data needed for the study. He further highlighted that it is not restricted to the selection of participants only but also involve the settings, incidents, events and activities to be included for data collection.

In order to answer the research questions, purposive sampling in this study assisted in selecting what might be the best holders of information regarding climate variability and gender. Government officials and other NGO stakeholders that had practical experience and knowledge in issues pertaining to climate variability and gender as guided by the research questions were selected. In addition, only the community members affected by droughts and were considered to be vulnerable to droughts, based on a criteria by World Vision, were singled out for this study because they had rich information that would advance the research. The officials that worked in Mudzi district assisted in the identification of the most vulnerable women in the communities who had been hit by droughts and some of the homesteads were visited to confirm their vulnerability.

3.3.2. Target population

This study targeted both adult men and women as the primary informants who had lived in Mudzi district for over 10 years. These community members were targeted because they experienced climate variability and had the knowledge of the climate history of the area. Although men formed part of the primary informants, women were the main unit of analysis. These women were not isolated from their households as whatever livelihoods they practised contributed to the upkeep of their families, hence had a bearing on their households. Mudzi district is a drought-prone area and the rural communities that rely on rain-fed agriculture is generally affected by droughts. The whole community was severely affected by drought yet there were cases of the most vulnerable people. However, the effects differ from one household to another depending on the levels of income diversification. Due to accessibility issues, the Candidate only focused on the beneficiaries of food assistance and there was no indication from the interviews if there were other women who were not affected by droughts. There was a general consensus in the humanitarian industry that the communities in Mudzi district were affected negatively by drought thus clouding any outliers who were resilient to droughts. Only a few households had reliable water sources within their proximity. Although it is usually advantageous for communities with water sources to invest in agriculture in the villages, the issue of capital always impedes them to venture beyond subsistence farming.

The whole community assisted World Vision in identifying the worst cases for their programme. It was not predetermined on the type of women to be approached rather the guiding factor used was that they needed to be beneficiaries of food assistance. The community members were considered by World Vision as the most vulnerable in the community based on the following criteria: chronically food-insecure population, elderly and disabled, households taking care of chronically ill people, female-headed households, and households with no livestock. Among these community members that were selected, there were worst cases of vulnerable women, who were

chronically food insecure and these were identified by the Chairperson, during the purposive sampling of the interview participants. Out of the beneficiaries that were purposively sampled, widows, married women and men were the sampled population, which provided a balanced approach and voice of interpreting the data. Since this was purposive sampling, none of the single women were referred for interviewing. In a traditional village in Zimbabwe, single women who have never been married form part of the main family and rarely form or head their own households. Unlike in urban centres were single women can opt to live alone, it is a rare phenomenon to have single women heading households unless it is a child-headed household.

Representatives of government officials and NGO staff who worked with communities in Mudzi were also selected. These officials were selected because of their technical knowledge on climate variability and gender hence they did not only answer questions using their theoretical perspective but from a practical experience as they worked closely with communities. These representatives held key positions of influence and interacted with the communities regularly, thus understood the dynamics of the communities. Serving at a district level positioned them well in the local communities.

3.3.3. Sampled population

Thirty-one respondents participated in this research as shown in Table 6. According to Mason (2010), sample sizes in qualitative studies are generally smaller than in quantitative studies and further pointed that if sample sizes are too large, the data becomes too repetitive and superfluous. In his research on sample sizes used for PhD studies, he found that the common sample sizes were 20 and 30. Nastasi (2018) indicated that for in-depth interviews, the general rule of thumb is to have approximately 30 people. On the other hand, Onwuegbuzie and Collins (2007) reiterated that a sample should not be too large to undertake a deep, case-oriented analysis

hence they proposed that 12 participants are interviewed in line with a study conducted by Guest, Bunce and Johnson (2006) that indicated that 12 interviews could result in saturation of data.

Table 6: Sampling Size

Proposed Target	Proposed Size	Rationale
17 women and 6 men from Mudzi district	23	Women were the primary sources of data and men participated in the research to augment the data collected from women.
Government officials operating in Mudzi District - Agriculture - Rural Development - Women Affairs, Gender and Development - Environmental Affairs - Small-Medium Enterprises Cooperatives Development	5	The government officials were the focal points in the district to ascertain the existing gender relationships, income generating activities, rural development, agriculture situation and how the environment was being affected by droughts.
NGO – field employees operating in Mudzi district.	3	World Vision was the only NGO operating in Mudzi district that was addressing issues of droughts and was knowledgeable on drought assessments and gender relations.
Total	**31**	

Source: Own (2018)

Moser and Korstjens (2018) suggest that the most important criterion in deducing the sample size is the availability of enough in-depth data showing the patterns, categories and variety of the phenomenon under study. They further pointed that in determining the sample size in qualitative research, the research should consider the richness of the data, the variety of participants, the broadness of the research question and the phenomenon, the data collection method and the type of sampling strategy. It was based on the above underlying scientific background that the size was considered adequate to provide necessary evidence for this research. The respondents were all key informants in the subject matter of droughts. Government

officials, NGO officials, and community members were sampled to inform this study.

3.4. Data Analysis

Data from different interviews with women, men, government officials, World Vision employees was analysed. Data from documents review and observation was also analysed separately before integrating it. All the data was analysed using the same procedure as outlined in the next section below. However, for document analysis, the research amassed data from various documents, selected the relevant data, appraised the data and synthesised it for analysis (Bowen, 2009) through the same procedure outlined in the next section below.

Similarly, the data obtained through observation was analysed by looking for patterns in order to build a picture of the phenomenon observed. Blanche et al., (2006) noted that there is no clear distinction between the period data the collected and the period it is analysed in qualitative analysis, they further distinguished analysis based on interpretative assumptions and social constructionism. Neuman (2011) added that patterns or relationships are sought after whilst collecting data hence influence the collection of subsequent data. Therefore in this study, the data was analysed concurrently with data collection as this informed the collection of subsequent data with other community members and government officials and also assisted in putting emphasis on new areas of data collection.

Maree (2007) further highlighted that research findings emerge from frequent, dominant or significant themes inherent in raw data. It is not always correct that frequent, dominant themes inform research findings. At times, the outlying data informs research findings and it should not be ignored. According to Neuman (2011), data analysis involves examining, sorting, categorising, evaluating, comparing, synthesising, and

contemplating the coded data as well as reviewing the raw and recorded data.

3.4.1. Preparing the data

The data from all participants was organised by describing how they were selected, their demographics, that is, age, sex, marital status, level of income and years worked or lived in Mudzi district. Since different groups of people were studied, they were separated based on how they were selected and how they informed the research; for example, the government officials' instruments were not amassed together with community members' responses at the beginning as they might have informed the research from a different perspective. Each participant was given a pseudonym in order to protect their privacy, and identify them easily. Data collected from interviews was organised separately from data collected through observation and secondary data sources.

3.4.2. Coding the data

Maree (2007:105) described coding as "marking the segments of data with symbols, descriptive words or unique identifying names." He added that coding assists in sorting out data so that emerging similarities and differences can be examined. In the same vein, Saldaña (2009:4) described a code in qualitative inquiry as a "word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data." He further equated a code to a title of a book or a film that captures its content and essence.

Throughout the process of coding, patterns emerge and these are categorised. Bernard (2006) highlighted that in analysing patterns, one seeks to understand why the patterns exist. Patterns emerge from several forms such as similarity, difference, frequency, sequence, correspondence, or causation (Hatch, 2002). Blanche et al., (2006) noted that establishing

themes and coding the data blend into each other hence the process should be done concurrently. However, Saldaña (2009:13) pointed that “a theme is an outcome of coding, categorisation, and analytic reflection, not something that is, in itself, coded”.

In this study, the field notes that were captured were coded through assigning descriptive words. For example, the following interview excerpt was coded as an adaptation strategy: “The Area Development Programme is promoting the growing of drought tolerant crops like sorghum and pearl millet (Gabriel, a NGO stakeholder, interviewed on 19 August 2015). Similarly, what emerged from documents review was also coded using descriptive words and the data was further grouped based on the emerging patterns. Themes were established and data was coded concurrently so that the data would not be lost in an unorganised manner that would be difficult to manage.

3.4.3. Establishing themes

Blanche et al., (2006) emphasised that themes should come up naturally from the data collected, however, research questions should guide the flow of the themes. He further advised that using the respondents’ language is always better than using some abstract theoretical language. Furthermore, the themes should be thought of in terms of processes, functions, tensions, and contradictions. Ryan and Bernard (2003) described themes or categories as classification of more discrete concepts which are expressions not only found in text but in images, sounds and objects. Themes are deduced from repetitions or same network of ideas or local terms that sound unfamiliar or used in unfamiliar ways (Ryan & Bernard, 2003).

Barkin, Ryan, and Gelberg (1999) categorized their major themes first based on the theory they developed and then went through the transcripts and cut out all quotes that pertained to the major themes. They further

sorted the themes into piles of similar quotes and different quotes which enabled them to come up with sub-themes. Similarly, in this study, the major themes based on the research questions and theories were extracted from the data and then emerging sub-themes were further categorized. In this study, the themes were developed from the data with the guidance of the research questions. The themes that were derived from the study are factors that make women vulnerable to droughts, the different livelihood strategies, and issues of coping and adaptation. These were further subdivided depending on the sub-themes emanating from them yet the key issue was to identify vulnerability in the context of Mudzi.

3.4.4. Structuring analysed data

Once the themes were established and the data coded, the themes were analysed for relationships. Data was analysed for similarities and differences in themes and continued reordering the data until it could be interpreted with ease in an informative way.

3.4.5. Integration of data in analysis

Bazeley (2012) acknowledged the value of having different but mutually informing data types. Cronin, Alexander, Fielding, Moran-Ellis, and Thomas (2008) highlighted the value of the relationship that is derived from utilizing different methods which they accorded equal weight to the findings of all the methods used for answering the research question. Integration using different but complementary sources best occurs at the stage where results are being composed, well before the final conclusions are made (Bazeley & Kemp, 2011). Cronin et al., (2008) argued that the utilisation of different methods does not violate the epistemological or ontological assumptions that underpin them; neither does it necessarily lead to any particular knowledge claims concerning validity or complexity.

Table 7: Integration of Data

Research Concept	Data Source	Analysis
A. Livelihood Strategies	A1. Semi-structured interviews	What emerged from source A1 was connected to source A2 and A3 to fully understand the research concept A and this applied to all concepts. Similarly, if for an example, a research participant Y and Z brought similar issues on research concept A through sources A1 and A3, the information was integrated and argument was developed on the differences.
	A2. Observation	
	A3. Documents review	
B. Coping mechanisms and adaptation strategies	B1. Semi-structured interviews	
	B2. Observation	
	B3. Document review	
C. Vulnerability of women to droughts	C1. Semi-structured interviews	
	C2. Documents review	
	C3. Observation	

Source: Own (2018)

Data from interviews, observation and documents was analysed hence there was need to integrate this data in order to answer the research questions as illustrated in Table 7. Data from different sources was structured based on the events in what is termed data braiding. According to Vatne and Fagermoen (2008), the end product of the braiding is that data from all sources pertaining to one event are interwoven together into a single text thereby enabling the data to be analysed and interpreted. Cronin et al., (2008) argued that data sets from different methods should be retained to allow findings of each dataset or method to contribute equally to answering the research questions in their own terms. The methods interface with each other through some kind of designed and systematic juxtaposition (Cronin et al., 2008).

The key aspects from this research are the livelihood strategies, coping mechanisms, adaptation strategies, and the vulnerability of women to droughts. These aspects were analysed through structuring them based on common themes. The original data, which is the individual data from different sources, was maintained in order to be able to analyse it as a whole. Once all the data was structured as illustrated in Table 7, it became

easier to do various analyses; holistic analysis of each level of abstraction, focused analysis of each element in each level, and analysis of all areas together, as well as analysis for the group of actors (Vatne & Fagemoen, 2008). Individual data was analysed before looking at it holistically then a synthesis of data was done.

3.5. Validity and Reliability

In order to determine the trustworthiness of this qualitative study, the naturalistic terms of credibility, transferability, dependability, and confirmability were utilised. Validity refers to truthfulness of data and according to Neuman (2011), qualitative research is interested in achieving authenticity than realising a single version of truth. He described authenticity as a fair, honest, and balanced account of social life from the viewpoint of the people who live it every day. Internal validity refers to credibility or truth value; and external validity refers to transferability or applicability or generalizability (Guba, 1981; Merriam, 1998). Credibility asks if the results are believable from the perspective of a participant in the research (Merriam, 1998) and if one can establish confidence in the “truth” of the findings of a particular inquiry (Guba, 1981).

According to Creswell and Miller (2000), the researcher can determine the credibility of a study by determining how long they stay in the field, whether the data are saturated to establish good themes or categories, and how the analysis of the data evolves into a persuasive narrative. Additionally, individuals external to the study can establish the credibility of a study through their reviews. To establish the credibility of this study, three lenses were utilised, that is, the peer reviewers, the research participants, and the researcher delved into the communities to seek the truth through different respondents. The research triangulated data collection methods, which are semi-structured interviews, observation, and document review to ensure that the data is reliable and valid. The different data collection methods were

combined with different sources which are men, women, government officials from different departments, and NGO officials. By interviewing different stakeholders, this assisted in validating data collected from the other parties. Moreover, the utilisation of documents review and observation method gave confirmation to the issues that can emanate from interviews.

In analysing the data, the data collected was organised and categorised based on set themes that emanated from the research questions. Furthermore, patterns were deduced from the data that were consistent without the dismissal of outliers. The data was analysed and interpreted with the guidance of the set theories and research questions. Any information that was contradictory was validated by verifying the facts through other tools and the research assistant in order to obtain the untarnished truth within the same period of data collection. In order to establish credibility in a study, it is recommended that the setting, the participants, and the themes are described in rich detail (Creswell & Miller, 2000). According to Denzin (1989), “thick descriptions are deep, dense, detailed accounts...Thin descriptions, by contrast, lack detail, and simply report facts.” In this study, effort was made to ensure that all the pertinent details were captured and quotations were utilised where necessary to reflect the voice of the respondents.

On the other hand, for a study to be externally valid, it needs to be vetted for generalizability or transferability or applicability. The qualitative research can enhance transferability by doing a thorough job of describing the research context and the assumptions that were central to the research (Merriam, 1998). The research can be transferred to another context if it is within similar parameters that are defined in this study. Thus, any person who would want to transfer this particular study needs to understand the context and the assumptions that were central to this study. It is through their interpretation of this study that they can be able to utilise it.

Reliability refers to dependability or consistency of data (Guba, 1981; Merriam, 1998) and this can be achieved through the use of various data sources and multiple measurement methods. Dependability emphasises on the need for the researcher to account for the constantly changing context within which the research occurs (Merriam, 1998). When the study was undertaken, Mudzi district had been identified by the World Food Programme as a vulnerable district hence resources were being injected for short-term resilience projects that could benefit selected wards. This could actually change the livelihoods of women in the district if the projects met the objectives in a longer term. However, it should be noted that at an individual level, the study still has value and contribution in understanding women's vulnerability to droughts.

Lastly, for a study to be trustworthy, it needs to be objective or neutral. Creswell and Miller (2000) highlighted that "objectivity is presumably guaranteed by methodology; if the methods are explicated, open to public scrutiny, replicable, and at least one step removed from direct investigator-subject contact." The burden of neutrality from the investigator is shifted from the data to the confirmability of the data produced (Scriven, 1972). There is need to minimise bias in both the data collection and analysis procedures thus for this study, the procedures went through rigorous vetting through peer review to ensure that the data produced can be objective.

According to Neuman (2011), validity and reliability are usually complementary concepts, but in some situations, they conflict with each other. It is thus important to ensure that the data is both valid and reliable. Merriam (1998) pointed that the findings are reliable and valid if the data supports the finding. In this study, the findings were based on the data collected within the parameters of the context of the vulnerability of women to droughts and the responses employed.

3.6. Ethical Considerations

There are some ethical considerations that were executed in this study. The author drew data from the community members of Mudzi District hence there was need to protect these community members from any harm. Mouton (2001) stressed that ethical considerations are an obligation for the practice of science, society, the subjects of the science and the environment. In carrying out this study, the following ethics were considered:

3.6.1. Informed consent and disclosure

All the details pertaining to this study were disclosed as fully as possible so that the participants could give an informed consent. This assisted the respondents to feel at ease and to make a choice on whether to participate in or withdraw from the research. In this study, the researcher used the local language, Shona to interview all the research participants and explained the intention of the study thereby clearing any forms of false expectations. In this research, following the advice from the Ethics Board, the research participants did not sign the consent forms rather all the details were explained verbally in detail. There was no manipulation of participants to obtain any data in this study, neither was any information withheld to encourage participation. There were gatekeepers in the form of the District Administrator who attempted to block the collection of the data. However, the District Administrator instructed the accompaniment of the Central Intelligence Officers whenever the data was being collected to ensure that there were no political motivations.

3.6.2. Bias

The researcher shared the list of interview questions with the Ethics Board and the Supervisor who scrutinised them to minimise some forms of bias. An objective stance was maintained by selecting the research participants using set criteria and adhering to the data collected. The interpretation of the data was confined within the parameters of the data collected and the theories utilised. There was no fabrication of any data collected neither was

there any intentional wrongful and biased interpretation of any of the findings. Issues of validity and reliability were tackled through triangulation, diversification of the sample, re-checking data collected if in doubt, and providing a rich, thick description of the context to ensure that there would not be misrepresentation of facts.

The study was conducted independently in an unbiased manner as a student and there was no influence from World Vision, the employer of the student. The research assistant was hired and trained on how to collect the data without any discrimination of any data in order to give a complete narrative of the experiences of the research participants. The advantage of utilising this particular research assistant was that he had prior experience with data collection and was well-acquainted with expectations in data collection, thus he had relevant background knowledge for this task. The research assistant was a Field Monitoring and Evaluation Assistant who had an extensive experience in data collection. There was a constant interaction with the Supervisor to probe the ideas and interpretations generated from this study.

3.6.3. Do no Harm

All the research subjects were protected from any harm whether physically or psychologically or emotionally. The study intended to bring out issues of women's vulnerability to droughts thus caution was taken not to cause any emotional breakdown. There was no emotional breakdown among all the respondents that were interviewed.

3.6.4. Anonymity

The study utilised pseudonyms to protect all the research subjects and the respondents were informed that their names were not going to be divulged in any document when consent was sought to collect data. The data collected will be kept in confidentiality for all parties and all participants were assured that no information will be leaked or divulged in other spaces apart for academic purposes. Although I took photographs in this study through

observation, I was granted consent through the District Administrator to utilise any data collected. However, there were no people in any of the photographs and the topography taken poses no ethical harm to the communities.

3.6.5. Approval from Ethics Clearance Board

Emmanuel et al., (2009) highlighted that if people know that research has been reviewed and approved by an independent group, they are more confident that it is ethical and that the people who participate will be treated fairly. The primary responsibility of each ethics committee member is to decide independently whether the proposed research protects the interests of participants adequately and keeps to exemplary standards in research activities (Department of Health, 2015). The proposal and all annexes including the data collection tools were submitted to the Ethics Clearance Board and it was approved after feedback was given to change some pertinent issues which could have compromised the ethics of the research. The supervisor issued a letter informing the District Administrator of Mudzi that the researcher was a registered student at the university and was going to undertake the research for academic purposes only.

3.6.6. Role of researcher in the research process

World Vision was the only NGO operating in Mudzi district that dealt with drought relief projects in 2015 when the data was collected. The researcher was not aware of this until she went to the field to collect data. She worked hand-in-hand with a Field Monitoring and Evaluation Assistant to carry out the research, and the research assistant was briefed on issues of objectivity, anonymity, and other ethical requirements. In order not to prejudice the research, the assistant was not involved in the selection of the research participants as he might have known them rather, the Chairperson of the project sites identified all the vulnerable women and men based on the criteria the researcher issued and directed them to the researchers. The researcher also visited some households and interviewed women from

there. This also assisted her to make observations of the homesteads, and establish levels of vulnerability with guidance from the Observation guide.

3.7. Limitations

Price and Murnan (2004) described the limitations of a study as those characteristics of design or methodology that impacted or influenced the interpretation of the findings from one's research. According to Simon and Goes (2013), limitations are matters and occurrences that arise in a study, which are out of the researcher's control. They further stated that limitations affect the extent to which a study can go, and sometimes the end result and conclusions that can be drawn. Limitations are the shortcomings, conditions, or influences that cannot be controlled by the researcher; that place restrictions on methodology and conclusions (Informed Services, 2017). Below are some of the shortcomings, conditions or influences that limited this study:

- The research focused on a case study of women in Mudzi district thus the findings might not be applicable to the whole of Mashonaland East or Zimbabwe. However, much effort was taken to ensure that issues that are presented in Mudzi district be tackled in that area and maybe find commonalities with the other studies that were undertaken in Zimbabwe.

- Resurrección (2013) argued that women are connected to their environment hence adapt well in times of natural disasters. Given that droughts have been occurring frequently in Mudzi District, some women did not perceive themselves as vulnerable. However, the interview questions and the interview style determined how the vulnerability of the women is captured.

- Due to the political sensitivity in Zimbabwe, the research relied heavily on the communities in which World Vision works as

rapport had already been established. However, she set a criterion of the selected research participants independently. Hence, the data might be different in areas where there is no NGO presence and no assistance programmes for vulnerable women.

- Accessing government officials was a challenge which the researcher tackled by making use of World Vision contact people. It was not possible to interview all the government officials hence the researcher had to leave the interview schedules for the respondents to be interviewed in their own free time by the research assistant. The positive thing is that the guidelines were very comprehensive hence this did not restrict the data collected although the narrations were not as detailed as the recordings. Follow ups were made to clarify some issues.

3.8. Summary

This chapter focused on the design of the research. The research site was described and how the research was conducted. There are a number of similar studies that were undertaken in other countries and the researcher looked at these to draw areas of further research which influenced this research. This chapter also looked at how the respondents were sampled and how this study fits into a case study given the contextual issues that the researcher focused on. The research utilised the interviews, observation and documents review as data collection tools. The rationale for selecting these tools vis-à-vis the integration of these tools was discussed. In the analysis of the data, common themes were pulled out of the tools and the data collected was integrated. Issues of validity and reliability were discussed. In addition, different ethical issues were discussed and how they were addressed in the community. A number of limitations were specified and the role of the researcher was explained.

CHAPTER FOUR

FINDINGS ON LIVELIHOODS, COPING MECHANISMS AND ADAPTATION STRATEGIES

4.1. Introduction

This chapter presents the findings of the study undertaken in Mudzi district. Different livelihood strategies are presented and the challenges faced as a result of the droughts experienced in the area. In addition, this chapter looks at how women are coping with and adapting to droughts in Mudzi district and also considers the inputs from the stakeholders on how they are assisting women to adapt to droughts.

The researcher interviewed 31 people in Ward 3 and Ward 7 of Mudzi district out of the 350 beneficiaries of World Vision registered for the Cash for Work project. The people interviewed were 23 community members (17 women and 6 men), five government stakeholders, and three NGO staff who work in the field. The researcher had planned to sample 30 respondents but ultimately sampled 31 respondents. Since World Vision was the only NGO addressing drought issues in Mudzi district and only three employees had vast knowledge about the communities, the researcher added an additional woman who had stayed in Mudzi district since birth. Initially, four NGO staff members were supposed to be interviewed but only three were selected because they were the only ones who had rich experience in working in Mudzi district. On the other hand, it was recommended through the interviews with one of the NGO staff that a government employee from the Small and Medium Enterprises Cooperatives Development department who had rich experience in building resilience to droughts in Mudzi district through equipping community members with skills and knowledge be included. This therefore maintained the number of government and NGO

stakeholders at eight. Pseudonyms are used to identify the respondents to protect them.

The data collected through interviews, observations, and documents review was initially categorised in the relevant techniques. In presenting the data in this chapter, the data was categorised into themes based on the research questions and subsequently sub-themes. Whenever a pattern spread across the three techniques, the data was integrated to avoid duplication and this reinforced the trend. In instances where there were outliers, the technique was also acknowledged and data was presented after confirming through other sources and techniques.

The bulk of the data emerged from interviews, followed by documents review and observations. It is important to note that in some instances, only one or two techniques informed a theme as some aspects of the themes could not be collected utilising all the techniques. Moreover, there were restrictions on what could be observed due to the political sensitivity of the area which denied the researcher access to visit most of the homesteads. Although permission was sought from the District Administrator to collect the data from the district, he was not keen to allow the researcher full access to the villages. Only five homesteads were visited but this did not hinder the collection of data as some aspects of what was supposed to be observed were readily available; that is, livestock and topography of the communities visited. The Observation Guide in Appendix 7 was utilised and formed the basis of the observations that were made.

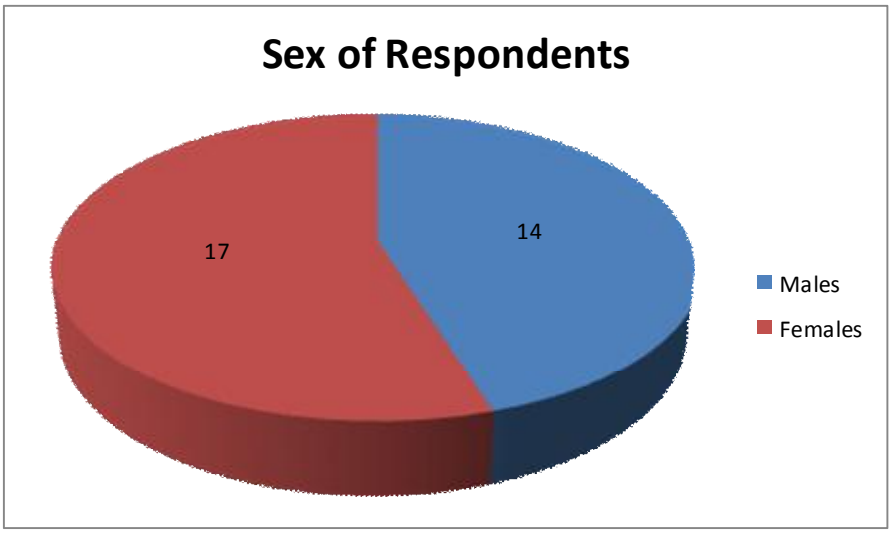
The next section describes the demographics of the respondents, that is, the sex and age of the respondents, their level of education and the years the respondents lived and worked in Mudzi district. This next section was informed by the interviews that were conducted.

4.1.1. Demographics

a) Age and Sex of Respondents

The respondents comprised of 17 women from the community, and 14 men; of which eight of the men represented the NGO (3) and government stakeholders (5), and the other six were from the community. More community women than community men were sampled as respondents because the study intended to understand droughts from women's perspectives and how women were responding to droughts in Mudzi district. Figure 8 shows the breakdown of the sex of all the respondents.

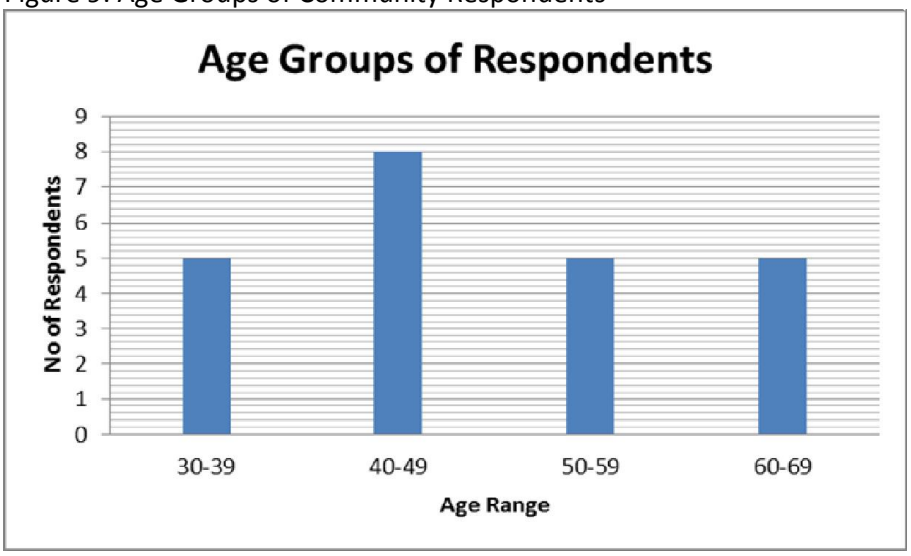
Figure 8: Sex of Respondents



Source: Own (2018)

All the respondents that were interviewed were over 32 years of age. Figure 9 shows the breakdown of the age groups of the community respondents. The majority of the people interviewed in the communities were between the ages of 40 and 49. It was especially important to interview community members who were over 32 and lived for over 10 years in Mudzi district in order to obtain rich data through their understanding of the context and how droughts had affected their lives. The older generation in their 50s and 60s understood better the historical climatic conditions since they lived longer in the community and had experienced the recurring droughts.

Figure 9: Age Groups of Community Respondents



Source: Own (2018)

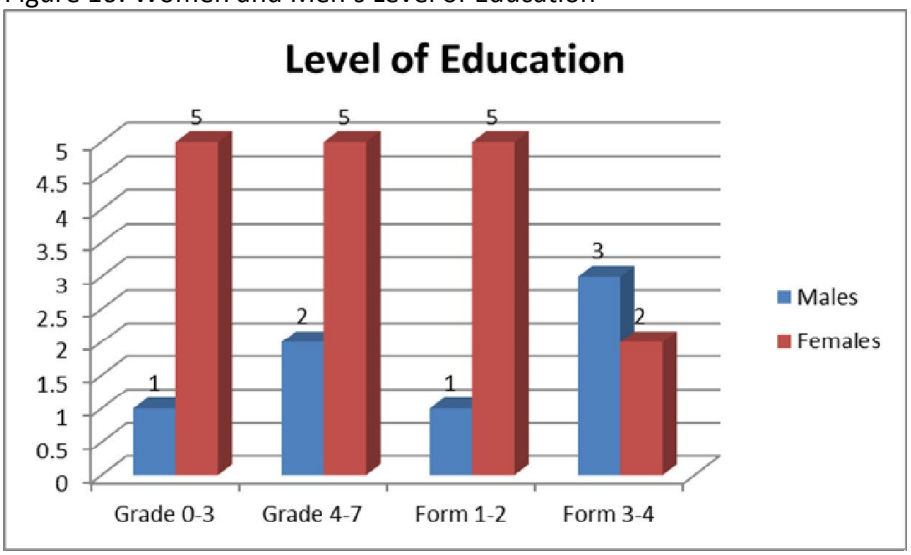
b) Years Lived and Worked in Mudzi

All the respondents in the communities that were interviewed had lived in Mudzi district for over 20 years hence had seen the climatic changes from one year to another. The stakeholders had a wealth of experience in working in Mudzi district with the longest serving 22 unbroken years in this area. The shortest service was four years which was enriched by the majority of the stakeholders who had worked in the area for a longer period.

c) Community Women and Men's Level of Education

The level of one's education influences how one makes decisions in life hence this aspect also brings debates on how successful a person can be based on their educational attainment. The community women and men's level of education is broken down from Grade 1 to Form 4 and is reflected in Figure 10.

Figure 10: Women and Men's Level of Education



Source: Own (2018)

More than half of the respondents in the community had not gone to secondary school with six of those respondents not even passing Grade 3. Ten out of 17 women interviewed had not gone to secondary school with half of those not even going beyond Grade 3. There was only one woman who was interviewed who had completed her Ordinary Level but on further probing, it was found that she was not originally from Mudzi district but had finished her schooling in another province.

4.2. Climatic Trends

The stakeholders were asked to describe the changes they had seen in the climatic trends. Gabriel, interviewed on 19 August 2015, said "*the climate had become very unpredictable. One year the rains are Ok and the next there are no rains at all. Water table is going down and many boreholes are running dry*." Moses also reported that "*the rainy season is becoming shorter as each year passes though total yearly rainfall rarely changes*." On 28 August 2015, Gareth reported that "*climatic patterns have shifted slightly; the onset of the rains has been pushed further to mid to late December. The rain season calendar is now much shorter, that is, December to March*." Charles, interviewed on 19 August 2015, also reiterated the same comment

that Gareth made by stating that "*the rainfall season has shifted. The rains are now received from December instead of October. The short season is affecting the harvest for many farmers*." Philip also echoed on 31 August 2015 that seasons were shorter, temperatures had increased and that the rainfall was erratic. He also pointed out that there was an uneven distribution of rainfall resulting in end of season or mid-season droughts or a dry spell. On 27 August 2015, Taffy also reported that "*the rainfall patterns have changed in that the amount of rainfall has decreased and there is too much heat, that is, long periods of dry spells*."

Obtaining official meteorological data for Mudzi district was a challenge, however efforts were made to utilise the available data from other sources that portrayed the climatic conditions. Kawadza (2014), in agreement with the officials interviewed, pointed that Mudzi district is in agro-ecological region 5 characterised by low rainfall, which is too dry for meaningful agricultural activities thereby perpetuating the need for food aid. Similarly, Chenga (2015) reported that Mudzi is a marginalised district, which is slowly turning into a desert, with average annual rainfall hardly going beyond 600mm since 1980. Of significance to note is that during the 1992 drought, the district received as little as 150mm of rain. In 2016, Mudzi only received half of what it normally receives in a normal year and planting had started 20-30 days later than normal due to late rains (Fewsnet, 2016). Furthermore, most of the existing boreholes and deep wells "turn into mere puddles during the rainy season" and are dry for nine months every year (Chenga, 2015). The Fewsnet (2016) also reported that water tables in boreholes had fallen so low that some boreholes had dried off. Given the narrations from different schools of thought, the climatic conditions in Mudzi district are not conducive for rain-fed agriculture, which the subsistence farmers heavily rely on for survival year after year.

4.3. The Livelihoods Affected by Droughts

4.3.1. Natural capital

Data presented in this section was informed by interviews, documents reviewed, and observation method. The women interviewed relied on farming primarily for their survival despite the recurring droughts. There was a level of hopelessness and resignation among the women as they considered farming as their only option even though there were recurrent droughts. "*Even when it rains, the soil quickly dries up. However, we only wait for the rains for our survival because we have no other options*" reported Tecla, interviewed on 25 August 2015. Similarly, Getrude expressed the same hopelessness when she said, "*The rains are so little and we cannot do anything to boost it. We use our soils for survival whether it rains or not because that is what we are used to*." During droughts, 16 out of the 17 women interviewed did not produce enough maize to last them to the next season. Only Grace produced enough to last her family the whole season because she had a borehole at her homestead. Maize is the staple food for Zimbabwe hence many families rely on it for their survival. With the recurrent droughts, the women interviewed struggled to survive from one season to another.

The women interviewed in Mudzi planted a variety of small grains which included sorghum, millet, lentils, groundnuts, and peanuts on a small-scale. However, the produce was not enough to sustain them. The 2008 Crop and Livestock Assessment report highlighted that the area planted to small grains had generally increased over the last five years, but in the case of maize, yields had generally been on the downward trend. According to the 2013 ZimVac Rural Livelihoods report, 71% of the population in Mashonaland East province (where Mudzi district is) did not grow small grains due to limited seed availability on the market, palatability, labour intensity, quelea birds, and wild life.

Tambu reiterated that for the past three years they had not produced good harvests. The women interviewed emphasised that they could not store food for the next season as the food they produced was not enough to be carried over to the next season. This was consistent with the 2015 Market Assessment report that stated that most households in rural areas were net food buyers as they did not produce enough food to meet their needs to the next harvest season. They relied on markets to bridge the food gap, with purchases of up to 65% of their maize and wages earned mainly through casual labour. Moreover, they did not have pesticides to spray on the maize to prevent deterioration neither did they have big granaries to keep the food.

Figure 11: Illustration of a Dry Land

Source: Own (2018)

The researcher found out from the interviews conducted that Mudzi district was a dry, semi-arid area and that it was tough to produce enough food to last a year. The researcher also observed that the soil is sandy and very rocky and this was confirmed through interviews where the women felt that nothing could really be produced from the soil. "*Our soil is finished, only manure and fertiliser can enrich it,*" said Phoebe, interviewed 19 August 2015. There was a constant outcry from the respondents that the soil needed fertiliser and manure to enrich it. In contrast, Matthias boasted that

the soil he relied on was good and during droughts he practised market gardening as he had access to the nearest Mudzi river. Elias, Peter and Kahudzi concurred with Matthias that they had good soils that they relied on for their agricultural ventures although the erratic rainfall affected their outputs. On the other hand, James reiterated that the soil is poor thus needed fertiliser and water. Figure 11 illustrates the topography of Suswe ward, which is dry and sandy with scattered vegetation, where some of the interviews were undertaken.

The 2002 Crop and Food Supply Assessment report highlighted that the use of Compound D (7N-14P-7K) basal fertiliser and Ammonium Nitrate (34.5% N) for top dressing, which are the two main types used for maize, varied significantly among provinces based on the rainfall distribution. Usage was higher where there was better rainfall distribution compared to drier areas thus non-usage resulted in poor root growth and susceptibility to droughts. The 2009 Crop and Livestock Assessment report highlighted the critical short supply of crop inputs such as cereal seeds and fertilizer which precipitated the soaring of prices beyond the reach of many farmers. However, Miriam had mastered the art of survival and she proudly said that she used “mujogo” whereby they plant before the rains come such that as soon as rains come their seeds would germinate and grow from the first rains.

Water for daily usage was a struggle in the wards visited especially in droughts. In Suswe ward, women obtained water from Mudzi River which was dry and sandy at the time of the research but dug some ponds they name “mufuku”. It was reported and observed that livestock and humans shared the same source of water. Some women reported that they woke up as early as 01h00 to queue up for water at the nearby borehole which was getting dry. There was also a Kudzwe Dam which the women accessed in times of droughts. The women and men that were interviewed reported that most of the dams and wells were dry except for Kudzwe dam in Ward 3 that

does not run dry throughout the year. It was observed that the majority of the women relied on “mufuku” during droughts whereby they dig the sand in the dam to obtain water to drink and to water gardens as illustrated in Figure 12. “*My family gets water from “mufuku” and we have no alternative source of water*,” said Matthias, interviewed on 20 August 2015.

Figure 12: Illustration of a Dry Dam with "Mujogo"

Source: Own (2018)

There was no borehole nearby that was observed in all the areas that the researcher visited although most of the women and men that were interviewed cited that they had access to boreholes or wells for their water sources when there is no drought. However, Maria, reported that the boreholes dry up during droughts. Similarly, Gareth, a NGO stakeholder, reported that the existing boreholes dried up and broke down due to overuse. The 2014 ZimVac Rural Livelihoods Assessment survey found out that only 22% of the rural wards in Zimbabwe had irrigation systems and only 44% of these were functional. There were no irrigation systems in the areas that the researcher visited.

The nutritional gardens in the communities were underproductive as the water sources were dry. However, Grace lived near a stream such that she

planted all her maize there. At the time of the interview, she still had eight bags of maize in her granary because of her source of water. Grace was married and her husband had a lucrative small business that boosted their income. This was a unique household which was in contrast to the closest neighbour, Cecilia's household who was a widow and did not have anything in sight to show her resilience to droughts. This exposed her to vulnerability to droughts as her only source of income was rain-fed agriculture and did not have any livestock. Cecilia did not consider any alternatives to rain-fed agriculture which entrenched her in a vicious cycle of vulnerability to droughts and reliance on food assistance from NGOs thus creating dependency syndrome.

4.3.2. Financial capital

Interviews and documents reviewed informed this section. World Vision had selected all the vulnerable people in the community for a Cash-for-Work project. The women and men that were interviewed had been receiving $55 monthly for a household of five members for creating assets for the community. This project's duration was for six months and was meant to create resilience to droughts. Other than this short-term project, all the women that were interviewed did not have any other viable source of income apart from farming which included vegetable sales. From the interviews, the women expressed lack of options to obtain additional reliable income. "*There is nothing else that we can do if there is no rainfall. We just sit. We are always struggling during droughts. Right now, we are grateful that World Vision came to assist us*," uttered Phoebe, interviewed on 19 August 2015. Similarly, Gloria, Rebecca and Tecla, expressed the same desperation that they only waited for the harvest because they did not have other options that could give them income.

According to the 2015 Poverty Analysis Report, the national food poverty datum line in Zimbabwe for September 2015 was $154 monthly and the national consumption poverty line was $487 monthly for a family of five. It

was found in the 2014 ZimVac Rural Livelihoods Assessment survey that the national average household income in April 2014 was $111, which had slightly increased from $95 the previous year. However, in 2015, the national average household income stood at $86 which was dwindling dramatically thereby leaving Zimbabwe's population very vulnerable. The 2015 ZimVac Rural Livelihoods Assessment survey found that 47% of the rural population earned $50 or less, which is lower than the national average of US$86.

Given the national food poverty datum line in comparison to the income that the Mudzi women were earning, they were living way below the food poverty datum line which was deemed to classify them as very poor. Moreover, money access and circulation were difficult hence barter trade was being practiced most of the time. Maria reported that it took time for her to access any income as people did not have any money hence there was barter trade practice. She was quoted saying,

> *"There is no dollar at all, everyone is crying. You can spend the whole month without touching any dollar. Even the clothes I sew, no one gives me any cent rather they give something in return,"* Maria, interviewed on 19 August 2015.

Since almost everyone relied on vegetable gardening, there was flooding on the market hence the prices were too low to make a lucrative business out of selling vegetables.

Rebecca reported that she rented a garden from other community members because she did not have her own hence after planting, she obtained a maximum of $15 per month. Getrude and Grace respectively reported that they obtained income from cutting grass for thatching houses. A number of women interviewed provided casual labour "maricho" in which they supply labour to commercial farmers and in return they obtain a bucket of maize. "*My husband thatches houses and carving hoes' handles (kuveza mipini)*

and these give us at least $40 monthly. In addition, I obtain between $20 and $30 from vegetable gardening," Grace, interviewed on 25 August 2015. Similarly, most men interviewed relied on casual labour during droughts; however, they ventured into better income generating out-of-farm activities than women such as mining, selling wares, carpentry, roads rehabilitation and painting outside their villages.

Saving money was problematic for the women that were interviewed because they relied on the $55 stipend which did not last for the whole month. If they saved anything, it was spent within that same month as demand for food arose. Getrude, interviewed on 19 August 2015, was quoted saying that "*kamari kacho hakasungirike nekuda kwenzara*" which means that the money could not be saved because of drought.

4.3.3. Social capital

Data presented in this section was informed chiefly by interviews. Relationships are an integral part of the Shona culture and whenever one is in need, there is a sense of altruism that pushes the other to assist. Given the recurring droughts, it was found in Mudzi district that some women still ask their neighbours and families for assistance when in difficulty. Grace cited that she only asks for assistance from her neighbours when she does not have any option. "*I only ask for assistance when my things are finished but people grumble when giving because they are also suffering. A person who helps you is one who really is a true friend to you,*" said Tambu, interviewed on 25 August 2015. In concurrence, Trudy cited that she asks for food when there is none in her house but people now think ill towards each other due to droughts. Although some women borrowed from each other, they felt that it is hard for everyone hence they were obliged to return. It was hard to ask for cash but easy to borrow salt, maize meal, and soap from the neighbours. At times, the burden cannot be shared as it piles pressure for other people to give yet everyone is struggling. The 2009 ZimVac Urban Food Security Assessment report echoed that the proportion

of households reporting having someone who support them from time to time declined from 28% in 2006 to 19% in 2009.

It was revealed that community members do not ask for assistance from each other even if they are in need because they felt that almost all people do not have anything to spare (Maria, John, Phoebe, Gloria, interviewed 19 August 2015; Jane, interviewed 25 August 2015). This was echoed by Phoebe who felt that begging would expose her hence she refrained from it. On the other hand, Miriam reported that as a result of droughts, relationships were being strained. In addition, Susan also concurred with this statement by emphasising that communities no longer assist each other. It was emphasised that the economic situation in Zimbabwe is bad and no one has extra cash or food to give out (Peter and James, interviewed 19 August 2015; Barbra, interviewed 25 August 2015).

A few savings clubs were reported in Mudzi district and the women contributed between $5 and $10. Gloria, Getrude, Miriam, Trudy, Tecla, Molly, Barbra, and Jane belonged to a savings club but the rest of the women interviewed did not join any club. However, the men interviewed saved money that ranged from $2 to $30 monthly, which far exceeded what the women saved. The main challenge that women raised is that there is dishonesty and mistrust among the people hence they could not start such initiatives. However, Cecilia, interviewed on 25 August 2015, reported that they had a farming club whereby some women from the community planted crops as a group then would sell the produce and share the cash received from there. There were a number of women who cited “zunde ramambo” as their communal coping strategy although others felt that it was grappled with corruption.

> *“We practised “zunde ramambo” whereby after harvesting people would take a portion of their produce to the chief for storage. In times of drought, the chief would distribute the food to the needy people. This concept was stopped in some areas as a result of corruption as*

the chiefs were squandering the produce without permission from their subjects," cited Cecilia, interviewed on 25 August 2015.

4.3.4. Physical capital

Interviews, documents review, and observation method informed the data presented in this section. Maria, Miriam, and Getrude indicated that their husbands owned the land although they had access to it. This resonated with reports from John, and Matthias respectively, who indicated that they owned the land although the whole family had access to it. On the other hand, the widows, Gloria, Tecla, Rebecca, Tambu, and Cecilia were not deprived of the rights to land when their husbands were deceased thus the land entirely belonged to them and utilised it for subsistence farming activities. All women interviewed had easy access to the land and if they were married, there was joint ownership of the land's produce.

Other than land, the 17 women owned cattle, goats and chickens although this differed from one woman to another and also their marital status. The majority of the women interviewed owned on average two cattle, three goats and six chickens. Similarly, the men interviewed owned a few livestock, with an average of two cows and three goats, which was lower than the survival threshold of cattle and goats. This was below the survival threshold of cattle and goats owned nationally of three and five respectively as cited in the 2014 ZimVac Rural Livelihoods Assessment report. A few households owned pigs, for example, Miriam and Grace, owned one pig and Gertrude owned three pigs. On the other hand, Gloria and Cecilia stated that the chickens in the area were being attacked by a disease which was killing most of them.

According to the 2014 ZimVac Rural Livelihoods Assessment report, only 14% of the households owned more than five cattle with Matabeleland South and Matabeleland North having a higher proportion of households owning more than five cattle. This was consistent with the findings in Mudzi

district and reinforced the finding from the 2011 ZimVac Rural Livelihoods Assessment report that stated that poorer households rarely own cattle. In times of drought, they sell these livestock in order to survive. The need to acquire livestock was to cushion them during droughts so that they can be able to sell them, which is a negative coping mechanism. The 2009 Crop and Livestock report pointed that livestock was traded for grain by the desperate owners under very unfair trading terms, which were dictated by the grain sellers mainly from urban areas. For example, a beast was traded for anything between two and four 50kg bags of maize grain compared to around one tonne per beast during normal trading.

4.3.5. Human capital

Data presented in this section was informed chiefly by interviews and document review. The average family of the women that were interviewed in Mudzi district had five members. This provided a good workforce if all members could work and contribute meaningfully to the advancement of the economic welfare of the families. Susan, Grace, and Trudy cited that they had chronically ill family members that they were staying with them, hence they were unable to provide agricultural labour. The rest of the women interviewed were able bodied and could work hard to provide for the family although there were older women above 60, Sandra, Phoebe, and Cecilia who were not as fit as the rest.

Although the majority of the women that were interviewed were able-bodied, households without men were most hard hit by droughts. Out of the 17 community women that were interviewed, 11 were widows and six were married. All the community men that were interviewed were married. "*Some of us are by ourselves thus we get comforted when we obtain the little money from communal farming. Most households that are around us have no fathers. There are many widows and orphans*," said Gloria, interviewed on 19 August 2015. It was found that the households that had male figures had livelihoods that generated more income that those with women only.

Getrude cited that in her household, they collected grass for thatching houses and made bricks for building houses. This gave the household about $45 on a good month. There was a trend however among the married women that were interviewed that the men stayed at home whilst the women looked for money. Although they shared ideas of generating income, from the interviews it appeared that the women took the lead in all the activities.

Maria, Miriam, Tecla, Phoebe, Gloria, Sandra, Molly, Tambu, Barbra, Cecilia, had not gone past Grade 7, with only five women having reached Form 2. None of the 17 women interviewed had any formal vocational training or tertiary qualification.

> "*Getting a job requires someone who is educated. I tried enrolling in Early Childhood Development (ECD) course because I have passion for children but English, which was the medium of instruction, vexed me. I also used to go for workshops for ECD but because my English is not good, that hindered me from progressing. My heart really desires this vocation. Going to college would have been a challenge because it needs someone who has the basic education*," said Phoebe, interviewed on 19 August 2015.

Even the six men interviewed, although three had Ordinary Level certificates, none of them had any formal skill that could be utilised in times of drought apart from Peter who had carpentry and painting experience. This resonated with what Getrude reported that her husband had passed four subjects at Ordinary Level and had done carpentry but had not been using the skill, neither had he been working. The 2013 ZimVac Rural Livelihoods Assessment report highlighted that the proportion of children of school going age who were not in school at the time of the assessment was highest in Mudzi (27%), followed by Umguza (23%) and Tsholotsho (20%). Mudzi had a significant increase of children who were out of school at the time of the assessment compared to the previous assessment.

Even though some families had children who had finished Form 4, none of them passed well enough to be able to support the families with a formal job. The majority of the households looked after young adults who finished school but are unemployable. This was highlighted by Maria who indicated that her two children had completed their Ordinary Level but were staying at home doing nothing as they did not pass. Her daughter was impregnated and was staying with her baby at her homestead. In addition, John cited that his son had completed Advanced Level certification and left the country but did not send any remittances. On the other hand, Getrude reported that her son had completed Form 4 and was driving, though he was not assisting the family. Miriam also reported that she had daughters who were married and were living far away from Mudzi district. They visited once a year and that was the only time they brought a few groceries to assist her. However, her other sons aged 23 and 20 were not contributing to the upkeep of the family as they were not working.

> She was quoted on 19 August 2015 saying, "*I have a son aged 35 who went to Mozambique a long time ago. He doesn't phone and I don't even know where exactly he is. I don't know what he is doing. It really bothers me because he has never come back home*."

The trend of young adults migrating to cities or out of the country was cited in a few households and all these young adults were not sending any remittances to their families.

Gloria stated that although her children were as old as 27, she assisted them and was staying them so that they avoid stealing from the neighbourhood. Although Gloria assisted her adult children to curb crime, this was a challenge as emphasised by Phoebe. *"I have a son aged 19 who impregnated a young girl aged 15 and he is not contributing any income to the family. It is a challenge for me to have grown up children who do not work*," reported Phoebe, interviewed on 19 August 2015.

4.4. Threats and Challenges in Drought Response

Droughts affect women differently; and within the same area, different challenges are experienced. There are a number of factors that threaten women to respond effectively to droughts. Responding to droughts effectively calls for a shift in the mind-set; adequate and various resources; and a conducive environment for one to change their approach of doing things. Some women have become so used to vulnerability that they do not perceive themselves as vulnerable. They have accepted the status quo and cannot see anything better that can change their lives. Interviews and documents review methods were utilised in informing this section. Data presented on this section on challenges that women faced during droughts were informed chiefly by interviews and documents reviewed. Only a few indicators were observed. Below are the challenges that were cited:

4.4.1. Food insecurity, land and capital access

Philip, from Agritex; Gabriel, Gareth, and NGO stakeholders reported that women in Mudzi district had poor access to capital hence this threatened effective ways of responding to droughts. This was reiterated by most of the women that were interviewed. Although all women that were interviewed reported that they had access to land, Gabriel, a NGO stakeholder, reported that women did not access the land adequately. Some of the men that were interviewed reported that they owned the land fully as the fathers of the households.

The women interviewed reported that access to cereals was constrained during droughts hence it was hard to feed families. This was further echoed by Philip, a stakeholder from Agritex, and Getrude who reported that there was a high level of food insecurity which was contributing to high levels of stress, thereby leading to deteriorated health. In addition, Gabriel, a NGO stakeholder reported that accessing food was difficult hence this also had negative repercussions on accessing money for school fees for the children

and everyday needs as whatever little that was acquired was channelled to meet food needs.

In 2014, it was reported in the ZimVac Rural Livelihoods Assessment that Mudzi district had the second highest number of food insecurity in Zimbabwe at 17.8%. Although, the district did not have the highest number of food insecurity based on the 2015 ZimVac Rural Livelihoods Assessment, the number of food insecure people had risen to 19%. The trend from 2013 sees the number continuously rising which can be attributed to the continuous droughts that are hitting the district. It was observed on 19-20 and 25 August 2015 that the dams were dry and the women were already digging within dams to access drinking water for people and livestock.

4.4.2. Migration

One stakeholder from an NGO, Moses revealed that most men move out of Mudzi district to seek employment in surrounding districts of Mutoko and Murehwa where there are commercial farms. Women are then left with the burden of looking after children alone at home. He further stated that most problems are generally considered to be women's business especially in polygamous marriages, thus looking for food becomes their business. This challenge was also echoed by another stakeholder from Women Affairs, Charles who reiterated that women are engaged in many activities to source food thereby losing other opportunities that could benefit them. This might be due to the high levels of vulnerability of the communities that were interviewed, which hampered them from moving to other locations, where their skills could be utilised. However, the children who finished school migrated to nearby countries and towns but hardly sent any remittances to their families. Although the stakeholders cited challenges that were emanating as a result of migration, none of the women that were interviewed had that view. Migration was perceived as an opportunity that could sustain the families through remittances, if tapped on positively.

4.4.3. Early marriages, religion and culture

Charles, a stakeholder from Women Affairs, Lloyd, a stakeholder from Rural District Council and Taffy, a stakeholder from Small Medium Enterprises Cooperatives Development cited that there were increased early marriages for young girls as a result of droughts.

> *"There still exist early marriages that disadvantage their empowerment in places like Chimukoko ward 3. Young girls are married to older men through the apostolic church which disturb their education. They are relegated to domestic functions which have limited access to livelihood activities,"* Moses, a NGO stakeholder, interviewed on 25 August 2015.

This was a major concern which was also confirmed through the interviews with the community members and different stakeholders. Gabriel also reiterated that low education threatened the women from responding to droughts. On the other hand, Charles pointed out that cultural factors were a major hindrance as men did not allow women to venture into some economic activities and projects. In concurrence, Taffy, from Small and Medium Enterprises Cooperative Development, reported that men could be rigid as they did not allow women to participate in some of the income generating activities hence there was a low uptake of these programmes by women. Philip also identified traditional set ups and religion as hindering women from responding to droughts. It was observed on 25 August 2015 that there were some apostolic religious sects that dominated some parts of the district. Although most women reported that they made decisions within their households, Gareth reported that their decision-making powers were limited. He further pointed that most women did not hold leadership positions in the community thus there were a few women who were councillors or chiefs.

4.4.4. School drop-outs

School drop-outs and early marriages for young girls usually go hand-in-hand. Trudy reported that due to droughts some children did not go to school. This was emphasised by Takudzwa, a stakeholder from Environment Management department, who reported that the majority of the women were illiterate thus lacked knowledge that could assist them to make some decisions regarding their welfare or even how to respond to droughts. In addition, Gabriel, reiterated that the majority of the women had low education hence this threatened their response to droughts. Gloria acknowledged that her low level of education made her vulnerable to droughts as she could not have other alternatives of making a living. This was confirmed by the data collected which pointed to very high school drop-outs as many women who were interviewed never learned beyond grade 7. The demographics from the data collected from the women showed that all except for one who grew up in another province and married in Mudzi district did not complete their secondary education or even finished Grade 7 at primary school level. Due to the impending droughts, there were increased school drop-outs and children were subjected to hard labour. The 2013 and 2015 ZimVac Rural Livelihoods Assessment reports verified that the district was faced with a high prevalence of school drop-outs with rates of 27% and 42% respectively. These statistics were higher than the national levels, that is, 11.5% in 2013 and 24% in 2015. According to the reports, the main reason for the school drop-out rate was financial constraints.

4.4.5. Gender-based violence

Charles, a stakeholder from Women Affairs, reported that there is a high prevalence of gender-based violence in Mudzi district due to food insecurity in households. It was observed informally that there were many stakeholders working to fight gender-based violence in Mudzi district and upon interviewing informally the stakeholders, it was established that many women were subjected to violence in the district.

4.4.6. Depletion of natural resources

There was exploitation of natural resources as a result of competition thus inducing unsustainable resource utilisation. This was further qualified by claims that safe water for drinking, cooking, and bathing was compromised. It was observed that the nearby dams were dry and women were digging within the dams to obtain water. It was the same water that livestock were drinking. Some women highlighted that they travelled over 10km to fetch water as it was scarce and their nearby sources were dry. On the other hand, Takudzwa indicated that natural resources were mostly vulnerable during drought due to firewood selling, deforestation that is caused by vegetable garden fencing, and gold panning which results in land degradation as people strived to earn a living.

The combination of factors mentioned above created a negative environment in which women could thrive. What seemed to be the root of the factors that were threatening women to effectively respond to droughts were the low levels of education in the district which hindered them from attaining meaningful and diverse livelihoods that could increase their finances. It was a vicious cycle as even the children of all the respondents did not proceed to attain any tertiary qualifications that could change their financial situation. Behaviour change was not easy given the background of low education levels, cultural influences, and religious beliefs. These influenced their attitudes and perceptions towards responses to droughts. The lack of resources to practise their newly acquired knowledge and skills further impeded their drive to resilience to droughts.

4.5. Women's Responses to Droughts

Droughts occur very frequently in Mudzi district hence the women's need to adapt in order to be resilient to droughts. There are different ways in which the women in Mudzi district respond to droughts and they can be summed as positive and negative responses. How women respond to droughts

determine their resilience or vulnerability to droughts. The responses to drought that emerged from the interviews can be applied when there is no drought, however what is peculiar is the extent in which the respondents spend time on these activities because they will not be working on their own farming lands; and their sole reliance on these activities to survive as their major source of livelihood would be stressed. Thus, the analysis of these activities is important to demonstrate the constraints that emerge as income generated from these is very low and unsustainable. During drought, the analysis demonstrates complexities of the responses, which are weak, unsustainable and unviable in the middle of scarcity and these precipitated new evidence through which additional reflections provided new nuances informing new considerations in the theories used. Specifically, the conservation of resources theory by Hobfoll (1988) stated that people must invest resources in order to protect themselves against resource loss, to recover from loss, and to gain resources. The notion of investing resources needs to be qualified especially given the vulnerability context of women in Mudzi district.

As much as it is important to always plan ahead of the misfortunes of drought, it was found that there were no sustainable means that could shield women from the vulnerability to droughts as they reacted more than they put in place sustainable measures to deal with droughts in the long term. In some cases, some women in Mudzi district did not have any mechanisms in place to prepare for droughts. Data presented in this section was informed chiefly by interviews and document review. Some aspects were observed. Below are the different coping mechanisms and adaptation measures that were employed before, during and after droughts.

4.5.1. Casual labour

The women coped through providing casual labour whereby they obtained cereals from those that would have harvested. They hardly obtained money

from casual labour thus at times they took on extra work to obtain money for food items. It was found that women earned almost half what the men earned when they provided casual labour. Casual labour included tilling the soil and herding cattle. They travelled for long distances to obtain work hence this separated them from their families for a considerable time. According to the 2002 Zimbabwe Vulnerability Assessment report, casual labouring, mainly agricultural piecework, is the most important source of income for the poorest wealth groups in almost every part of the country, with only a marginal increase in relative importance in southern areas.

The 2002 Crop and Food Supply Assessment report pointed that poor families undertake a number of activities to meet their food needs such as working on wealthier farmers' land, or doing piecework on nearby commercial farms, with payment being made in the form of food rather than cash. In a normal year an average person could earn up to 15-18 kg of maize grain per day, but payment could drop to 5-10kg per day in a bad year. One day's work would only be adequate to feed an average family for slightly more than one day. The 2002 Zimbabwe Vulnerability Assessment report further explained that casual labour has serious potential implications for production, as typically during the cultivation season, poorer households would divide their time between working on their own fields and working for others to feed themselves.

4.5.2. Petty trade

There were a number of activities that women engaged in for petty trade which brought meagre income. For example, Maria reported that she bought and sold clothes but this was erratic. However, she usually obtained small grains in exchange of the clothes. On the other hand, Phoebe practised pottery but only obtained 50c once in a while hence this was not sustainable. Cash circulation was a challenge in Mudzi district; hence the popularisation of barter trade.

"I sew clothes which does not bring substantial amounts of money. I was only getting a tin of peanuts from sewing instead of cash. I last sewed in 2007 as the material is expensive yet people do not pay cash. The economy does not encourage this type of income generation activity. I also go to Mozambique to hoard rice as a way to cope with droughts," Tecla, interviewed on 19 August 2015.

4.5.3. Communal farming and vegetable sales

Figure 13: Example of Communal Farming

Source: Own (2018)

Getrude, Rebecca, Miriam, Tecla, Trudy, Tambu, Grace, and Jane relied on vegetable sales to obtain extra income however, the men generated more income from the sales as they travelled further out of the villages and sold in bulk. On the other hand, Cecilia relied on communal farming, which is illustrated in Figure 13, whereby a group of 11 women planted on one big piece of land and shared the profits they obtained from selling the produces. They contributed the seeds and time to till the land. The garden was observed on 25 August 2015. The women drew water from the nearby dam that was dry but managed to dig holes termed "mufuku" within the dam to extract water from there. In some areas that were visited, there were no boreholes at all and the women wished they could have boreholes in their area so that they could practise gardening. They hoarded vegetables from other people with big gardens to sell along the highway. In other areas, women rented gardens

because they did not own land close to water sources. None of the men interviewed were involved in communal farming.

4.5.4. Income generating activities

Other than petty trade, some households engaged in income generating activities that could potentially bring substantial income if the environment is conducive or there is human capacity. This was reflected through Getrude who was married to a man with an Ordinary Level certificate, who moulded bricks once in a while, and earned $30 from selling them. She also collected grass for thatching houses which gave her $15. Although this was not frequent, the family had a skill which could assist them in times of droughts. Similarly, Grace reported that her husband thatched houses for $30 although this was erratic. It was generally agreed that income generating activities would assist the communities in order for them to adapt to droughts. However, there was no diversification of skills and financial capital to implement any of the activities that could benefit the women. Moreover, the economic situation in Zimbabwe was tough such that it was difficult for people to pay cash for these services. There was also a gender disparity regarding who embarked on income generating activities as households that had male figures engaged in them more than in households with no men.

4.5.5. Grain storage

Storing grain in the granaries was a response that emerged from the data collected. Cecilia, Jane, Barbra, Sandra, Janet, Susan and Molly reported that they stored their agricultural produce in the granary. All the seven women interviewed who reported that they stored food for future utilisation admitted that the food usually lasted for less than five months. This was not sustainable as droughts had been occurring every year which had been affecting the quantity of their harvest. In addition, they did not have big grain storage facilities; neither did they have the chemicals used to spray the

harvested grains for insects not to attack them. The men interviewed had storage facilities for their crops although it was not large enough to store food for over a year.

4.6. Early Warning Systems

Data presented in this section was informed by interviews only. All the women, apart from Getrude reported that there were no early warning systems in place in Mudzi district. Getrude reported that she obtained information from the agricultural extension workers that there would be a drought but this did not influence how she prepared to respond to it. However, Cecilia indicated that she knew that there would be a drought when it was too hot or when the first rains came. Similarly, Sandra and Barbra reiterated that they knew that there would be a drought because of the rainfall patterns and the direction of the wind. It was common to be aware of droughts when there were no rains as John pointed that he only got to know that there is drought when he sees that there are no rains or there is a late onset of rains. The planting season had changed and most women planted their crops in December as this is the time they expected the rains. However, Grace stated that she planted earlier in anticipation of rain thus once it rained, her seeds would have germinated already. She had learnt this from the training provided by the agricultural extension workers.

4.7. Successful Responses to Droughts

Data presented in this section was informed chiefly by interviews and some aspects were observed through the Observation guide in Appendix 7. Apart from the women interviewed, a number of stakeholders were selected to inform the research and these were specialists in environment management, disaster risk management, women affairs, rural development, small and medium enterprises cooperatives development, and agricultural development. They were requested to establish the criteria used to select their beneficiaries as this was key to determining the groups they worked with in the field. Philip cited that beneficiaries were selected based on their

willingness to cooperate, ability to work and also only those that had the means of production were selected by Agritex. On the other hand, Gareth indicated that World Vision considered the vulnerability and food insecurity of the community members. It was observed that there was an integration of efforts among the stakeholders to address the issue of drought in Mudzi district as the government officials were seen accompanying World Vision employees to the field to monitor projects. The stakeholders cited a number of projects that had been undertaken to effectively respond to droughts which the women did not mention as they were being interviewed. This was a result of the different communities where the interventions were made by the different stakeholders.

World Vision was assisting the communities in creating assets such as drilling boreholes which were mechanised to ensure the efficient distribution of clean, safe water and also establishing nutrition gardens and fish ponds (Gareth, interviewed on 28 August 2015). At the time of the interview, this was work in progress and nothing had been finalised. He further highlighted that the project the women were involved in could in the long term enable them to be more resilient to droughts as they were tending nutritional gardens, constructing fish ponds, and constructing dip tanks. At the time of the interview, the borehole, dip tanks and fish tanks had not been finished but there were envisaged to benefit the community.

Figure 14: Illustration of Conservation Farming

Source: Own (2017)

On the other hand, Philip reported that they were training women on moisture saving techniques termed conservation agriculture but out of all the women that were interviewed, only Grace practised it on her farmland. In addition, the fenced communal garden observed had some pit holes which the women were utilising to practise conservation farming with the guidance from the World Vision. Cecilia reported that she was in a farming club where they all planted and reaped the benefits through communal sales. Close to this communal garden was a dry Mudzi Dam which World Vision had accessed through pipes to draw water closer to the garden. Figure 14 illustrates conservation farming which World Vision was promoting through the Cash-for-Work project.

Gardening was a very common response to droughts in Suswe and Chimukoko ward and was a successful strategy when there was a source of water that did not run dry. Because it was a common survival strategy in the area, it meant that the women competed for clients to buy the vegetables hence the prices were too low to make good profits. Trudy stated that there is a flooding of the vegetable market such that in a month, she only obtained

$2 if ever she obtained anything as people did not have money. She reported that the people exchanged her produce for a small tin of peanuts.

There were reports that Women Affairs department was mobilising the community to accept the production of drought tolerant crops (Charles, interviewed 19 August 2015). Lloyd also stated that they were promoting the planting of suitable drought tolerant crops in the region. The interviews with the women showed that there was an extensive production of small grains such as sorghum, millet, and peanuts. The women on average harvested two bags of small grains as they did not plant it on a larger scale because they preferred growing maize. Taffy from Small Medium Enterprises Cooperatives Development stated that people should not focus on maize production and should be involved in animal ranching and small grains production. In concurrence, Phoebe reiterated that planting of small grains such as sorghum and millet cushioned them in times of droughts as these were drought tolerant crops. Moses, a NGO stakeholder cited that small grains thrive even in drought-prone regions. There was a general consensus among the stakeholders interviewed that the production of small grains such as sorghum and millet was a successful intervention in responding to droughts.

In addition, paying school fees for girl children was mentioned by Gabriel as one successful response that was undertaken by World Vision. Be that as it may, none of the women that were interviewed had girl children who had reaped the benefits of education. Moses, interviewed on 25 August 2015, mentioned that:

> "E*mpowerment should start from grass-root level to assist women realise their worth or potential. A vicious cycle of poverty persists if the old family belief set-up which believes only a boy-child should be sent to school is not addressed at both school and society."*

In addition, Charles, Moses, Taffy, and Philip reported that the women were being encouraged to form Village Savings and Lending Groups. Philip cited that savings and lending clubs had worked as a response to droughts, however, only a few women that were interviewed had internalised and practised this initiative as a way of building resilience. Negativity and scepticism hindered the successful implementation of these groups as reflected by Maria, who said that she did not want to venture into these clubs as she was sceptical of this initiative because it seemed to benefit the first person who received the cash.

Casual labour was a common coping strategy which nevertheless produced meagre income or grains for survival. Mathias reported that his family provided casual labour which brought instant results because the payment could be in the form of food which they consumed during droughts. In addition, Getrude, Susan, Rebecca, Molly, Tambu, Grace, Cecilia, Jane, and Janet provided casual labour in drought and this was their means of survival as they failed to produce enough food to take care of their families. At the time of the interviews, it was however cited that the involvement of World Vision assisted them as this was their sole source of income (Maria, Phoebe, Susan, interviewed on 19 August 2015; Barbra, Molly, interviewed on 20 August 2015; Cecilia, Janet, interviewed on 25 August 2015). The income they were receiving was helping them to buy cereals and other non-food items. The women who reported that they only depended on World Vision for substantial income also cited that they provided casual labour as their main source of income for their monthly income when there was no food assistance.

The utilisation of irrigation schemes was cited as a success in responding to droughts by Charles from Women Affairs and Takudzwa from Environment Management Agency but none of the wards that were visited had any irrigation systems, neither did the women interviewed had access

to them. According to the 2008 Crop and Livestock report, most irrigation schemes in the country were performing below potential. It was recommended in the report that the physical infrastructure and management systems of these irrigation schemes should be rehabilitated to ensure their contribution to national food security.

The success of a response dwells on its sustainability and its replication to another area. The diversification of the responses reaps more benefits as some of the responses do not generate a lot of income thus if there are complementing stronger responses, the women benefit more. Given all the strategies that were cited by stakeholders as successes in responding to droughts, there is need to review them within the same context to determine their sustainability. On the other hand, if the same responses are applied in a different context, it should be investigated if they will be successful.

4.8. Summary

Women in Mudzi district relied on their land to produce food that was largely for subsistence use given the series of droughts. During droughts, the women only produced a few bags of maize which did not last for over five months. Other sources of livelihoods that they relied on were vegetable sales and casual labour which did not generate substantial income and was below the national food poverty datum line. They did not have any viable means of income apart from food assistance which they were depending on as they received cash for the assets that they were creating at the time when the data was collected. Although the social networks were still strong in the community, because of the prevailing droughts and lack, people were not comfortable to ask for assistance from each other as everyone was burdened.

In a country where there is a 97% literacy rate, Mudzi district was battling with high prevalence of school drop-outs. None of the women that had been interviewed had completed their Ordinary Levels apart from one who had

been married from another province. It might have been assumed that being in the proximity of Mozambique would make the women look for alternative ways of generating income but this was not an option for them. Women in Mudzi district were faced with different challenges during droughts that could be linked to each other in a cycle. The communities were characterised by early marriages, gender-based violence, food insecurity, depletion of natural resources and migration which was not beneficial to the communities as little or no remittances were received.

Women in Mudzi district had some common strategies to respond to droughts yet these lacked sustainability as they did not produce substantial income to sustain the families. The income that was obtained from the different strategies employed was below the national food poverty datum line hence left the women vulnerable to droughts. Although different stakeholders reported different adaptation strategies that they were promoting in the communities, it was found that a few women practised them. This brings the issue of community participation in selecting interventions and understanding contextual issues in promoting new interventions. On the other hand, the question comes up, of attitudes and perceptions that is derived from cultural practises, religious beliefs, and educational levels as this influences behaviour change.

The reliance on rain-fed agriculture year after year despite the successive droughts pointed to a lack of alternatives which was expressed in the interviews. However, the women's attitudes and perceptions hindered any behaviour change even though skills and knowledge were transferred to them. The majority of the women expressed that they did not receive any early warning information about the droughts and even when they received the information, little could be done to protect them as they did not know where to start from. Negative coping mechanisms, weak adaptation strategies compounded with limited, unviable livelihood strategies marked the complexities that the women experienced during droughts.

CHAPTER FIVE

UNDERSTANDING THE VULNERABILITY OF WOMEN TO DROUGHTS

5.1. Introduction

Vulnerability to droughts is contextual and what makes women vulnerable to droughts is different from what makes men vulnerable to droughts. Married women and female-headed households are affected by droughts differently depending on their support structure and the income they gain from their livelihoods. The size of families coupled with the poverty levels also contributes to the vulnerability to droughts. According to Turner et al., (2003:8076), "vulnerability rests in a multifaceted coupled system with connections operating at different spatiotemporal scales and commonly involving stochastic and nonlinear processes". They further explained that vulnerability should be understood in the intricacies of the human-environment system exposed to hazards, hence embracing comprehensive vulnerability analysis that is inclusionary of the whole system. Mutami and Chazovachii (2012) reiterated that the engagement of various livelihood strategies is determined by various factors which include seasonality, differential labour markets, risk strategies, coping behaviour, credit market imperfections, and intermittent investments and savings. The lack of integration of asset markets and difficulties that face the poor in obtaining access to better (internationally traded) assets and securities means that the portfolio of assets available to the poor is far from ideal (Dercon, 2000). In this chapter, an analysis would be made of how different livelihoods and responses to droughts contribute to the vulnerability of women to droughts.

5.2. The Nexus between Livelihoods and Vulnerability

5.2.1. Natural capital and vulnerability

As much as Mudzi district is hit by droughts almost every year, the study found that the most vulnerable women in the district continue to practise the same natural livelihoods for survival. They depended on maize crops and did not focus on drought-tolerant crops on a larger scale. A study conducted by Zishiri (2013) through the Ministry of Agriculture, Mechanisation and Irrigation Development on small grains and the 2015 Zimbabwe Vulnerability Assessment Committee Rural Livelihoods (ZIMVAC) report found that farmers were deterred from planting small grains because they are highly labour intensive and are prone to attacks by birds. Small grains such as sorghum and millet are promoted in semi-arid areas as they are drought resistant and require little inputs during growth (International Crops Research Institute for the Semi-Arid Tropics/Food and Agriculture Organisation, 1996; Leuschner & Manthe, 1996; Mukarumbwa & Mushunje, 2010; Taylor, 2003). Given the recurring droughts, more energy should be utilised for alternative crops on a large scale that require less rainfall thereby minimising the risk of producing no food at the end of an agricultural production season. However, farmers were reluctant to adopt certain drought-resistant species, partly because of their low market and consumption values, and partly because of the high labour investment associated with the cultivation of these species (Eriksen et al., 2005). Sorghum and millet have a potential to benefit poor, food insecure communities through maximising its use in human consumption, beverages and animal feed (International Crops Research Institute for the Semi-Arid Tropics/Food and Agriculture Organisation, 1996; Taylor, Schober, & Bean, 2006). Despite the challenges small grains present, the benefits outweigh the challenges as the harvest is guaranteed during droughts unlike maize. The reality that it is labour intensive could be turned around with a positive

attitude that will enable one to pursue the production of small grains with an end in mind.

Cecilia who was interviewed on 25 August 2015 reported that she would love more livestock in order to survive droughts because when droughts come, she would be able to sell the livestock and obtain cash. Miriam who was interviewed on 19 August 2015 reported that she sells livestock in order to cope with droughts. Jane, interviewed on 19 August 2015, also reported that she did not have livestock to sell during droughts hence this made her more vulnerable to droughts. Selling livestock in times of droughts is an erosive coping mechanism (World Health Organisation, 1998) hence the mind-set of wishing for more livestock in order to survive droughts needs to be shifted as this will only create a vicious cycle of poverty. Carter and Janzen (2012) emphasised that cash-strapped households sell off remaining livestock thereby reinforcing the poverty risks of uninsured risks. In contrast, Ngaka (2012) found that 85% of the large-scale farmers sold their livestock in the 2007/8 drought in South Africa compared to 26% of the small-scale farmers thereby commending the large-scale farmers for selling their livestock as a drought mitigation strategy to avoid losses. Prices of livestock significantly drop during droughts thus if one is to sell their livestock to obtain cash, the timing of the sales should be appropriate in order to counteract vulnerability.

The women that were interviewed responded that in order to survive the droughts that were hitting them, they needed fertiliser to enrich the soils that were poor. Prioritising fertiliser in a drought-prone area does not achieve a bumper harvest as the sun will still scorch the plants if there is no reliable source of water. Foti, Muringai, and Mavunganidze (2007) noted that fertilizer is assumed to increase production levels and productivity yet there are no studies to qualify these assumptions. Thus, there is need to consider the context in which fertilizer is distributed such as accessibility of water, soil type, the capability of the community to utilise the fertiliser effectively, and

the availability of other agricultural inputs such as seeds and pesticides. The perception that fertiliser would enrich the soils without considering the reality of droughts can perpetuate the vulnerability of women as their efforts are not integrated. The realisation that there is need for reliable rainfall for the fertiliser to be effective is imperative if women are to escape poverty and find means to respond to droughts effectively.

5.2.2. Financial capital and vulnerability

The women that were interviewed in Chimukoko and Suswe wards of Mudzi district did not have any formal jobs that brought any reliable income every month. Other than the Cash-for-Work project that World Vision had started in the communities through the World Food Programme, that earned them $55 monthly, none of the women that were interviewed had ever been gainfully employed. They relied on casual labour in times of droughts, whose monetary income was sporadic; hence they received grains in return for their labour. Adams (1991) found that about 70% of the respondents indicated that they sometimes paid casual workers in kind rather than in cash. This was consistent with the data collected from the women in Mudzi district that pointed that they hardly received cash from the farmers they worked for. The true value of money can be experienced if one reaps benefits from it. Thus, by having limited financial resources, the women were vulnerable as they could not derive the opportunities linked to financial availability and accessibility.

Getrude, Rebecca, Miriam, Gloria, Tambu, Tecla, Sandra, Grace, Jane and Trudy relied on vegetable sales but the markets were flooded as the supply was overwhelming. In contrast to this study, during the 1991-92 drought period in Zimbabwe, vegetable sales dropped by 50% as people moved to urban areas to earn an income (Kinsey et al., 1998). Income diversification through vegetable sales is commendable; however, the assessment of markets is important for the women to gain more returns. Moreover, the quantity and quality of the vegetables need to be good in order to be

marketable and bring more profit. In Mudzi district, the women sold their produce along the main road and their target clients were those that passed through this area. Vegetable sales did not bring substantial income that could boost the income of the families. This weakened their potential to earn more income.

The flooding of vegetable sales in Mudzi district limits the expansion of the rural livelihoods of the women as they compete for a few customers with one commodity. Market linkages are important in promoting the livelihoods of women in the rural areas. Women need to be empowered on how they can ensure that they benefit from the market. Locating new markets is an option that can be pursued; however, the quality of the products has to be assessed. According to Dercon (2002), well-functioning markets, helped by infrastructure, roads, and a demand for the products are important.

The availability of income and accessibility of grain markets play a big role in depicting the susceptibility of women to droughts. If one has no money, they cannot access the grains; on the other hand, if one has the money, but the grain markets are inaccessible, it is futile. The sources of income in Mudzi district are not viable and sustainable. Therefore, the inability to derive adequate finances to access markets poses vulnerability to women in Mudzi district.

5.2.3. Social capital and vulnerability

Adger (2003) pointed that if governmental intervention to plan for and forewarn communities in disaster planning, or to assist in recovery is largely absent, social capital takes over as a substitute for help from the state. This view can be challenged as it depends on the social context which can allow social capital to take lead in supporting the community. According to Bola et al., (2013), social obligation may not function properly during droughts or floods since people need to cater for their own well-being over and above everyone else. Maxwell, Majid, Adan, Abdirahman, and Kim (2016:71)

found that in Somalia, “social relations and connectedness can be as much as about exclusion as inclusion; as much about victimisation and exploitation as about mutual assistance and coping.” In communities such as Mudzi district, the government admits to having no financial resources to develop the communities thus focusing more attention on capacity building. Capacity building could reap great results if the social networks could encourage each other to utilise the skills and knowledge transferred to them. However, given that some women did not believe in the importance of the skills and knowledge, there was no full acceptance rather there was contempt of such skills. The women’s attitude towards the skills and knowledge hindered behavioural change.

Frost, Campbell, Lucket, Mutamba, Mandondo, and Kozanayi (2007) noted that poor farmers have difficulties in securing credit and loans. What makes it even more difficult is that in a cash-strapped country, it might even be difficult to pay back the loan and credit as the markets are not functioning effectively. It is not easy for neighbours to trust each other with the little resources they have as they all struggle to make ends meet. Relationships are important in rural areas thus credits and loans should not be an impediment in maintaining strong ties especially when one defaults in payments. Frost et al., (2007) found that loans obtained from a local micro-lender between 1999 and 2001 were considered as bad debts as the creditors invested in dryland cultivation which failed as a result of waterlogging and poor rainfall distribution in concurrent seasons. As much as it is difficult for neighbours to lend each other money, it is more difficult for micro-lenders to give all their resources to poor farmers who rely on nature which is becoming unreliable due to the changes in climate. Thus, women are left with little options of boosting their capital.

Chen, Wang, and Huang (2014) noted that one’s relationship with government officials benefited an individual as the government had direct access to resources. Having a prestigious role in a community usually

connects one to such relationships and further benefits an individual to access resources. In Mudzi district, none of the interviewed women had such direct access to government officials which might also be as a result of the community's ranking. Once one is at the periphery of vulnerability, it is difficult to associate with privileged members of a society as the social class determines association. On the other hand, at village level, it is even harder to forge relationships as the influential officials do not remain in the same village, if ever they are associated with them. Civil servants that work at grassroots level depend entirely on resources injected from the central government which has been difficult due to political and economic woes.

Human beings interact and depend on each other for survival. A phenomenon such as drought has a way of either bringing people together or drawing them apart. In Mudzi district, women felt each other's burdens but because the majority were in the same predicament, it was difficult to ask for help from each other. There was a unanimous understanding that everyone was struggling hence one could not impose themselves on the other for assistance. According to Harvey et al., (2014), farmers were unable to turn to their neighbours for assistance in the same region as they faced a similar predicament thus needed support also. An element of wanting to assist was there among Mudzi women, but was watered down by the imminent need that everyone had. Sopha, II, and McAndrew (2007) found that relatives and neighbours in Cambodia assisted each other in times of severe droughts through replenishing rice seeds, supplying small cash loans, guaranteeing loans with moneylenders, looking after the sick, giving access to the wells, and assisting the vulnerable groups. In addition, the villagers used their networks to obtain work in cities and nearby countries.

Comparing Cambodia with Mudzi district, the level of assistance was barely minimum because everyone was in need hence could not extend assistance that could have a big, positive impact to the neighbours and friends. The

villagers in Mudzi district could not access any loans as the economy was in a crisis and being in the periphery of the country with regards to the economic scale, further jeopardised accessing such opportunities. On the other hand, moving to other countries or cities to seek employment was not an option for the villagers as that required good networks and the ability of the villagers to provide an essential, scarce skill that could reap monetary benefits. Frost et al., (2007) found that in Masvingo the wealthy households accessed remittance income which assisted them in escaping poverty. Nonetheless, in Mudzi district, the major challenge was the low levels of education that faced the community. For someone to be employable there is need for certain skillsets and the potential to be trained to fulfil a role. Mudzi district lies at the border of Mozambique hence this would have been an easier destination to migrate to as the economy is thriving. Migration is an opportunity to grow financial resources and according to Maxwell, Majid, Adan, Abdirahman, and Kim (2016), it has always been considered as a livelihood strategy. Sopha, II, and McAndrew (2007) noted that participation in associations and networks depends largely on one's resources and social status. Given the low levels of education, skills, and knowledge in the villages, coupled with an economic crisis, chances of obtaining a reasonable job was limited.

On the other hand, group cohesion in Mudzi district was not very strong as there was a sense of independence which made women experiment in their own ways in order to survive. There were a few women who belonged to some savings groups but some of the women even felt like disintegrating from them because of a lack of trust. There was a belief that since the women depended solely on the income they were obtaining from World Vision, it was not certain that they would continue receiving the cash hence they would feel cheated if after paying the first few women the program changed. It was therefore difficult for some of the women to continue in savings clubs where there was uncertainty. According to Dercon (2000), introducing a focus on savings for self-insurance in the booming number of

initiatives related to microfinance operations could be of help. He further stated that groups could build up assets in good years to deplete in bad years for the benefit of its members, using transfer rules and mechanisms parallel to the risk-sharing arrangement for idiosyncratic shock.

Although the community was bonded through the Cash-for-Work project, this was a “forced” relationship due to drought as they commonly wanted to benefit from the project and the cash they were receiving. There was one communal garden that was observed that belonged to a group of women and in contrast to the Cash-for-Work project; the researcher found that the women spent the whole day in their communal garden where they were not receiving any external income. Although the objective of the project was to build the resilience of the community, the researcher observed that the community members were quick to leave the sites immediately after serving the four hours they were paid for which questions community ownership and group cohesion. It should be noted though that the community members were encouraged to do their own work that would bring extra income.

Standing together in times of need often reaps more benefits than being in isolation. The openness of working together in drought is a survival strategy that some women practiced in Mudzi district through communal gardens and savings clubs. However, those that worked independently continued in the same cycle of vulnerability.

5.2.4. Physical capital and vulnerability

The ownership of valuable physical resources cushions rural women from falling into the traps of droughts. Households with limited land holdings, with few assets that can be liquidated and with limited education, typically are most affected by the consequences of income risk (Dercon, 2000). Hansford (2011) noted that physical vulnerability is caused by the absence thereof, weaknesses in their design, or problems with their location. Although there were physical resources such as land, livestock, and good roads in Mudzi

district, the challenges were the weaknesses or underutilisation of such resources due to a number of intertwined reasons that are unpacked in this section. Antwi-Agyei, Fraser, Dougill, Stringer, and Simelton (2012) pointed that access to markets and good road networks can ensure that farm produce is transported to the market in good time and sold in order to obtain financial resources which are physical assets. It was observed that the road network in Mudzi district was good however; there were no market linkages that could enable the women to market their vegetables. Dercon (2000) explained that some areas may just be too remote to profitably enter into trade. On the other hand, the land was readily available but all the community members interviewed indicated that the soil was too poor to produce good harvests.

In rural Zimbabwe, the chief allocates land to his subjects through the Rural District Council. The value of land in rural areas is lower than the value of land in urban areas and even the structures built do not fetch high prices. Thus, owning a homestead in a village does not guarantee an appreciation in value of that place for future sale. The chief controls the land hence might not even consider reselling of the land as most of the village land is not for re-sale as it is public property. According to USAID (2009), land rights in Zimbabwe are highly insecure as evidenced by the Operation Murambatsvina that demolished all structures that were not registered with the City Council. USAID (2009) noted that although Zimbabwe is against the discrimination of women, when it comes to land matters in adoption, marriage, divorce, and inheritance, it defers to customary law as evidenced by the court case of *Magaya vs Magaya* which supported the half-brother instead of the daughter who had been nominated to be an heir in an estate. In Mudzi district, all the women interviewed had access to land and jointly controlled it with their husbands yet due to inadequate rainfall and other agricultural inputs, they did not yield bumper harvests that could sustain them.

In Mudzi district where crops are wiped away by droughts, tending of livestock could be an alternative way of survival. The women that were interviewed had an average of two cattle, three goats and six chickens. The 2014 ZimVac Rural Livelihoods report cited that the survival threshold of cattle and goats owned nationally was three and five respectively hence women in Mudzi district were living below the survival threshold. This meant that they were much poorer than their counterparts in other rural areas. It was reported that due to droughts, the livestock could not survive as there was no water for them to drink and they were also attacked by disease. On the other hand, these livestock were seen as a means to survive through selling them in times of droughts. Livestock could potentially be assets that the women could rely on during droughts; however, the quantity of the livestock was too low to even generate substantial income if they were to be sold. Moreover, even if they were to sell the livestock, it meant that they would be left with nothing they could fall back on in times of emergency such as illness in the family.

According to Sweet (1998), in Namibia, commercial farmers are quick to sell their stock when droughts are apparent as they sell at better prices, and that leaves more areas for grazing for the remainder of the flocks and herds, and reduces the need for emergency sales. On the other hand, these farmers are at times unwilling to sell due to tax liabilities from the sales. Without early warning systems, the small-scale farmers in Mudzi district are hit by droughts unexpectedly. Regarding their livestock, they own too little livestock to even generate a comfortable income when they sell, which leaves them in a cycle of poverty as they are forced to sell at lower prices due to the timing of the sales. In addition, it takes them longer to invest in livestock after the droughts. Cattle generate four times more income than goats therefore the income derived is too little, looking at the average stock a household owns. Married women do not usually own any cattle as the men largely command the wealth of the household.

The women that were interviewed in Mudzi district did not own any other valuable physical resources apart from the fewer livestock that they owned. The land they owned jointly or solely did not yield enough agricultural production for subsistence or for sale due to droughts. Despite putting an effort in the less-productive farming, a granary was only observed at one homestead. This means that the women did not have means to stock maize for longer periods, nor could they store for a medium scale sale. Therefore, the possession of little physical resources increased vulnerability to droughts as they could not trade some of their possessions on a larger scale. Where there was availability of land or a good road network, the utilisation was not effective due to the impending droughts or poor market linkages respectively.

5.2.5. Human capital and vulnerability

According to Scoones (1998) and Serrat (2008), human capital constitutes of the skills, knowledge, ability to labour, good health, and physical capability important for the successful pursuit of different livelihood strategies. The researcher observed that the women interviewed had good health although there were some reports of members who were chronically ill thus contributing to the depletion of income to pay for health services. Based on the Cash-for-Work project the women were working on, there was need for physical capability to labour hence they fit that criteria, although it was observed that the men did the most intensive manual work. This was a strength that the women possessed in supporting their households. The flipside of this advantage is that although there were skills and knowledge transferred to the women, there was limited utilisation. On the other hand, there were low levels of education among the women with a 42% school drop-out rate in the district as reported in the 2015 ZimVac assessment which was the highest in Zimbabwe.

The knowledge and skills that exist within a community enable it to survive droughts. According to Bhattacharya and Das (2007), human capacity

increases with betterment of literacy rates and higher spending on education by the state. Human capital in times of droughts enables one not only to depend on the natural and physical capital but to use skills and knowledge outside the community. In Mudzi district, it was found that none of the women that were interviewed apart from one woman who had migrated to Mudzi district had completed their Ordinary Level. It was also found that none of the women's children that were interviewed passed their Ordinary Levels hence they were staying with their parents thus not contributing to the economic development of the families. Functional literacy enables the post basic literacy graduates to effectively participate in income generating and development projects whereby they can use reading, writing and numeracy skills (Zimbabwe National Statistics Agency, 2014). Although the literacy rate was high in Mudzi district, basic literacy in a country with a high unemployment rate further disempowered women with low educational attainment.

Garbero and Muttarak (2013) pointed that education increases adaptive capacity by providing individuals with greater access to full-time work, high status, and well-paid work. Although the attainment of a well-paying job is debatable based on the current unemployment rate of over 90% in Zimbabwe, given a stable environment, the argument stands. Even though the country has a very high unemployment rate, encouraging migration to other countries is another option that could bring reliable remittances. However, there are issues related to family breakdown, HIV/AIDS, migration laws in foreign countries and the negative effects of brain drainage that are detrimental to the development of the country. Despite these issues surfacing, there are families that are living better lives in foreign countries and are contributing remittances to the extended families that remain in Zimbabwe. Without a skill that can pay you beyond the community you live in, it is difficult to even think of migrating: more-so the issue of networks comes into play as your inner circle of acquaintances is likely to assist you if you have a tangible skill that can bring income. In contrast to the common

belief that educated people can migrate for greener pastures, in a Pakistan study, Ashraf, Routray, and Saeed (2014) found that the better education level of the household head lessened the chances of migration as they had positive coping abilities. Tyler and Fajber (2009) argued that while migration may ultimately strengthen the adaptive capacity for families at “home,” it also exposes migrants to new social vulnerabilities. With the changing environment, education is likely to produce more benefits as expounded by Pudasaini (1983). Women can potentially apply their newly acquired skills and knowledge in adapting to droughts if they have been formally educated. Education increases the odds of obtaining a job that affords an extra income.

There was some knowledge sharing on how to adapt to droughts but it was rarely utilised. It was reported that some women even laughed at those that practised conservation farming. Government trained women on how to adapt to droughts but with no financial resources to implement, this still yielded little. Knowledge transferred to the women was not being utilised optimally and this, combined with non-completion of secondary education made the women vulnerable to droughts. The women could not be employed gainfully in the formal sector. It should be noted though that with an unemployment rate of 90% in Zimbabwe, completing secondary school in itself is not a guarantee of a job in a formal sector. However, if those that passed in secondary school are unable to obtain decent jobs, what more of those than never even completed high school? The economy cannot absorb them; neither can they be in an informal sector where there is so much competition and need for financial start-up capital for activities. According to Frost et al., (2007), poverty stems not from any basically dysfunctional resource management system, but largely from unproductive and uncertain physical and socio-economic environments. However, the reliance of women on natural resources without a fall-back plan is in itself detrimental, given that the socio-economic environment is not promising any vibrant revival in the short-term.

Managing droughts effectively in vulnerable areas requires diversifying livelihood strategies and income generating options within and outside agriculture especially into income generating options through non-farm enterprises and employment opportunities (Shiferaw et al., 2014). Therefore if the vulnerable women in Mudzi district could develop other skills that make them more attractive to the job market within or outside the country, they would be in a better space to have alternative sustainable income. Married women were more resilient to droughts as they employed livelihood strategies that brought more income than the widows. For example, there was a sharp contrast between Grace, a married woman and Cecilia, a widow. Although their households were next to each other, the state of the houses and the physical assets they possessed were different. This also applied to the livelihood strategies employed during drought as Grace had more lucrative alternative sustainable income. Having no support in the household limited Cecilia in exploring other alternative options, hence this confined her to continuously rely on rainfall. The availability of knowledge and skills in female-headed households does not translate to its utilisation immediately. Widows in the villages are subjected to discrimination due to power relations that do not recognise their contribution especially if there are no male representative to defend their positions.

Households in Bangladesh that rely on remittances from their grown children suggest that remittance payments from daughters tend to be less reliable because of the generally more unstable nature of female employment there (Holmes & Jones, 2010). On the other hand, Eriksen et al., (2005) found that contributions by children working elsewhere were erratic; and even spouses did not always provide reliable remittances. Valuable livelihood strategies that are focused, economically sustainable, socially acceptable, politically relevant and climatic smart are a better option as energy could be exerted on them.

Harvey et al., (2014) however argued that it might not be feasible for the economy to absorb 70% of the rural population that relies on agriculture into other non-farm employment thus it is important to focus more on agricultural productivity and improve the livelihoods of farmers through low-cost options. The low-cost options that were cited by Harvey et al., (2014:10) include "improved facilitating access to improved seed varieties, fertilizers, irrigation, improving road infrastructure and access to markets, providing greater technical support and extension services to farmers, and facilitating access to timely climate information, which could be used to inform the choice of crops, planting dates and management strategies." Although these options have proved to be a success in some African countries, in a country such as Zimbabwe with economic challenges, it is not viable to implement most of these in the current environment as most of the options call for capital which the government does not have. Therefore, it is important to consider other non-farm livelihoods that could potentially change the lives of women.

5.2.6. The integrated capitals and vulnerability

The livelihood strategies employed by women determine how they will either be vulnerable or resilient to droughts. A combination of capitals enables one to enhance their survival to droughts, although the financial value obtained from each capital matters in gauging the sustainability of the household. It is evidenced in the study carried out in Madagascar by Barrett (1997) that a diversified livelihood strategy is not a reflection of numerous opportunities; rather one that mirrors a lack of opportunity to specialise in higher earning income activities and an exposure to episodic severe external shocks to the livelihoods (Frost et al., 2007). Although women in Mudzi district attempt to diversify their livelihood strategies, this does not mould them to be resilient to droughts as they are built on a very weak foundation.

Mudzi district is reportedly characterised by high prevalence of school drop-outs, girl-child marriages and gender-based violence. These factors

contribute to the vulnerability of women to droughts as these create a cycle of poverty in that the women are not able to be gainfully employed in a formal sector, neither do they have effective alternatives to farming. Education endows individuals with real skills that are useful for work and for life such as decision-making ability and problem solving skills which can be useful in hard times (Garbero & Muttarak, 2013). Thus, the girl children are deprived of an opportunity to acquire skills and knowledge at a tender age which limits their choices to subsistence farming which is ravaged by recurring droughts.

The reliance on farming as a major source of income in a drought-prone area jeopardises their economic development. Although the informal sector could be an alternative, cash circulation is restricted thereby exacerbating the vulnerability of women as they cannot derive tangible income consistently. Moreover, with a very high unemployment rate in Zimbabwe, the majority of people have resorted to the informal sector, with stiff competition as there is a culture of imitating what seems to be a cash cow.

Although women had access to land but with no reliable water sources to enable agricultural productivity, this did not yield good results. According to Mzezewa, Misi, and van Rensburg (2010), marginal and erratic rainfall, exacerbated by high runoff and evaporation losses contribute to low crop production in semi-arid areas. Jagals (2012) defined the concept of reliability into three criteria, that is, availability, capacity and continuity. Applying these three criteria in this study, the water sources were not consistently available. The boreholes and dams ran dry quickly as the quantity of water was low. Hence the water supplies did not have the capacity to sustain the lives of the women as they could not consistently deliver water to the women. Thus, the women were left vulnerable to droughts.

The livestock they possessed were on average not sufficient to make them resilient to droughts. According to Bisaliah (2010), the capital accumulation from fixed capital (machinery, irrigation, building, etc.) is found to be more important than capital of agricultural origin such as livestock and tree stock in developed countries. He further admitted that livestock and tree stock capital is still more important in developing countries. Thus, owning livestock is a form of wealth that is regarded highly in rural areas which means that if there is fewer livestock in a household, this affirms their poverty. The equipment that the women in Mudzi district possessed such as hoes, scotch carts, wheelbarrows, and ploughs did not shield them from the droughts that were occurring as there was need for irrigation to water the crops and/or reliable rainfall. Moreover, investment in new technology for agriculture instead of relying on traditional equipment would have positively contributed to their production.

Lack of finances which emanated from non-productive work was a hindrance towards women's resilience to droughts. If there were enough finances, they could have irrigation systems and boreholes as water sources for productive farming or for other income generating activities that did not require water. Social capital in isolation is not effective in being resilient to droughts unless if the social network can inject a lot of finances to start a small business that can be viable. In Mudzi district, cash circulation was a challenge hence even the small businesses could not thrive as much as one would want them to.

The combined capitals the women in Mudzi district possessed were inadequate to buffer them from the effects of droughts. The capitals were not strong enough to meet the demands that the recurring droughts were bringing in the community. There was a need to move away from the status quo and try new dimensions of survival that had been tested in other communities. Having to rely on agriculture without changing the method led to the same results of low yields and reliance on food aid yearly. Frost et al.,

(2007), cautioned that there is need to consider both top-down and bottom-up approaches to rural development as a mismanaged macro-economy will have large negative impacts on the livelihoods of rural people. The external and internal community need to work together and consider the input from local women and men; and the exchange of skills and knowledge from the different stakeholders. Integrated efforts from local people and stakeholders at different ranks enable the revitalisation of rural development.

5.3. Coping Mechanisms and Women's Vulnerability to Droughts

Coping mechanisms are usually short term (Vincent et al., 2011) and reactive to droughts. The common coping strategies that women used in Mudzi district were casual labour and vegetables sales. Other coping strategies employed by the women interviewed were selling grass for thatching, selling livestock, changing eating habits, and reliance on food assistance. Masendeke and Shoko (2014) pointed that short-term solutions to droughts such as food hand-outs, food for work and supplementary feeding schemes immediately improve the material conditions of life in the existing drought situation but do not empower households to fend for themselves in future droughts. They concluded in their study in Mberengwa that the capacity for coping with drought is a function of the asset base, income distribution, and the capacity to cope with production in good years. Thus, in order for people to cope with droughts, the previous years have a bearing on the future as one's state of vulnerability prior to droughts jeopardises their responses later on. Coping mechanisms do not sustain families; neither can they bring a noticeable change that is long-lasting to a household. They are temporary measures that cannot be relied on year after year especially considering the recurrence of droughts in Mudzi district. Given the nature of coping mechanisms, women remain vulnerable to droughts as the measures they take are short-term, unsustainable, and have repercussions on one's resources.

5.3.1. Casual labour

Embarking on casual labour brought instant gratification in that the women immediately received grains from their place of casual work. The women travelled for long distances to look for work and left their families for a number of days. In return, they gained a bucket of grains every day. The grains did not substitute for other non-food items that were needed at their homesteads hence their needs were not sufficiently met. Eriksen (2005) found that casual labour is very hard to find during droughts and the pay is so low that it provides food for only one day if the family is large. This is consistent with Devereux (2006) findings in Malawi where it was found that casual employment was becoming increasingly scarce, and real wages are stagnant or failing. In Mudzi district, because most households were hit by droughts, they travelled very far which points to the scarcity of work in the locale. On the other hand, women either receive only a fraction of the daily wage of their male counterparts or are given in-kind (usually food-based) payment (Holmes & Jones, 2010). Eriksen (2005) pointed that casual labour is time-consuming which may lead to neglect of the household's own land preparation. Stehlik (2003) and Deveurex (2006) echoed the same sentiments that casual labour abandoned agricultural production on the family land. Furthermore, casual employment on farms or collection of wild foods rarely compensate for the loss of reliable food and income through farming (Eriksen et al., 2008). This poses challenges to the households as they get distracted and lose focus on their own homesteads, contributing to family disintegration as they leave their families for a number of days.

Obtaining money from casual labour was rare as the dollar was not circulating fully in the district. A bucket of maize costs between $5 and $9 in Mudzi district depending on whether one buys from other farmers or local shops. It was found that buying grains from other farmers who had imported the maize from other traders was more expensive than buying from local traders. Therefore, casual labour brought instant grains but still did not meet all the needs that the women needed. Naess, Sullivan, Khinmaung, Crahay,

and Otzelberger (2010) reiterated that casual labour income is not sufficient as money earned from the labour is insufficient to cover a household's expenses given that casual labour is a low-income activity. However, Little, Stone, Mogues, Castro, and Negatu (2008) noted that engaging in casual labour reduced the likelihood of selling livestock. Given the successive droughts in Mudzi district, a combination of selling livestock and engaging in casual labour was prevalent as the women tried to cope with the droughts.

5.3.2. Vegetable sales

Selling vegetables was a popular coping strategy yet it did not yield substantial amounts of cash. There was stiff competition for clients as the majority of women sold vegetables along the highway. At $1 per sale, the price of the vegetables was too low. It was reported that there was flooding of vegetables on the market such that some women could hardly make sales or they would just make a maximum of $2 per month. This actually discouraged the women from selling vegetables as the demand was too low. Naess et al., (2010) reported that vegetable gardening had become an important income-generating activity for women's groups, with land and water sources set aside exclusively for vegetable production in Ethiopia and Mali.

The formation of groups, cooperatives, and farming associations might have enabled the women in Mudzi district to sell their products in a more organised manner to supermarkets or wholesales. However, with no application of knowledge and skills to identify such markets and negotiate for contracts, this was impossible in Mudzi district unless there was an outside influence who could sell the idea to the women. Wiggins and Keats (2013) indicated that it is rare for companies to deal directly with smallholder farmers due to the costs involved in making small deals. They emphasised that companies turn to smallholders when there is no other convenient supply or when it seems that smallholders may be able to supply at lower cost than possible alternative supplies from larger farms.

Wiggins and Keats (2013) noted that there are concerns that women are often underrepresented or absent from the governance of local collectives, and that commercial schemes may allow men to take control over the more valuable assets of the household and the incomes they generate, while women are obliged to do extra work in the fields. Although this is not conclusive, it is important to understand such gender dynamics that continue to affect women. From the informal conversations the researcher had, it was deduced that women are afraid to take leadership positions and they had to consult their husbands before they committed to any role. It was difficult for the women to commit fully as they managed their own homes and were expected to be at home on time always. Thus, even in forming groups or associations or clubs, women could excel more if they were not committed to any marital relationship as there were no demands from their partners for their time and resources.

Accessing markets demands constant supply of quality produce in the right quantity thus the women in Mudzi district need capacity to deliver. A study conducted in Mexico by Eakin (2003) found that the vegetable farmers produced relatively small volumes of vegetables that were of poor quality which excluded them from profitable export markets and commercial contracts. On the other hand, households are only in a position to diversify into sustainable activities such as vegetable production or petty trade, if they have access to extra start-up capital (Naess et al., 2010). The limitation of finances hinders the expansion of market gardening thus hampering its sustainability. Bryan et al., (2013), noted that households with access to the fertile soils along the riverbank used irrigation to produce fruits and vegetables for sale in urban markets. Vegetable gardening requires reliable water thus it is not every woman in Mudzi district who had access to the riverbank soil. Those that practised vegetable gardening had easy access to the dams which however were running dry due to droughts.

5.3.3. Petty trade

Masendeke and Shoko (2014) pointed that the way out for the poor in drought prone areas is the development of non-farm rural activities which help to boost the income and thus enable households to fend for themselves. UNEP (2002) identified petty trading by women that emanates from indigenous knowledge as a household coping mechanism which decreases vulnerability and insecurity resulting from droughts. There were a few cases in Mudzi district whereby women were obtaining income during droughts through selling grass for thatching houses. It did not bring consistent income though since the target group were few people who were still building houses or renovating. Grass was readily available in the bush so this also limited the number of clients who could actually purchase. Moreover, the payments were not consistent as people were struggling to make ends meet due to the economic meltdown of the country. Duguma (2015) highlighted that women are faced with barriers such as limited knowledge of market conditions due to poor communication, and are restricted to short-distance mobility and small-scale trading of perishable and low-value goods. This applies to the case of Mudzi district as the women were confined to their area and were focusing on low-value goods. On the other hand, in a study in Kenya and Tanzania, Eriksen et al., (2005) found that women were traditionally excluded from more reliable income-earning activities because they were customarily performed by men. This was apparent in Mudzi district as women were confined to less-lucrative trading, especially those that were unmarried. The married women were benefitting from their husbands' work such as selling grass or thatching houses thereby sustaining their households.

Steglich and Bekele (2009) noted that women in Ethiopia started petty trading in groups and once they were established, they took loans for their individual small enterprises. In Mudzi district, the women interviewed were doing petty trade individually and the possibility of obtaining loans was very low due to economic hardships. The women interviewed had long given up on selling goods due to the unfavourable economic climate that did not

encourage cash circulation. Moreover, the clients were not able to pay the debts. Phoebe, interviewed on 19 August 2015, reiterated that she had last sewn clothes about three years ago because it was not profitable. She had a skill that could generate income in urban areas but could not utilise it outside her community because of lack of knowledge or market linkages. According to Eriksen et al., (2005), small-scale businesses or skilled work with a very local market, such as tailoring, were unreliable during drought when people had little money.

The Small and Medium Enterprises government department had been building capacity in communities on how to establish businesses yet the fall-out was the lack of resources to boost these businesses even outside Mudzi district where opportunities existed. According to Steglich and Bekele (2009), women in Ethiopia emphasised the crucial role that knowledge, information, and exposure plays in contributing to their empowerment and the success of their income earning activities. Information and knowledge combined with resources create an enabling environment for a thriving small business.

5.3.4. Selling livestock

Some women stated that they sold their livestock during droughts. Selling livestock during droughts further reduced the value as the sales were urgent in nature and could not negotiate for a higher price. Duguma (2015) found out from her study in Ethiopia that female headed households were more likely to sell their livestock as a coping mechanism to food insecurity than male-headed households. The average number of the livestock owned by the women was less than the survival threshold therefore selling even the fewer livestock they owned even made them more vulnerable to droughts. Cattle ownership is generally determined by endowments in male labour and land, suggesting that those with a poorer endowment cannot generate sufficient means to enter into cattle rearing, leaving them relatively more exposed to income risk (Dercon, 2000). When livestock is transformed into

cash, poor households may find that cash is quickly dissipated by their many needs, while wealthy households may be better able to hold on to the capital and reinvest it productively (Bryan et al., 2013). Although Ashraf et al., (2014) pointed that disposal of livestock helps to reduce its high carrying price during droughts and compared disposing of assets to withdrawing cash from the bank, the timing is equally important to derive substantial gains. Poorer households hold on to their livestock as this is their only investment (Silvestri, Bryan, Ringler, Herrero, & Okoba, 2012) and sell when it is too late to make any meaningful profit. It was the timing of sales and the pricing of the livestock that kept the women in a vicious cycle of poverty.

Moreover, due to droughts the quality of the livestock was poor thus further reducing the price of the livestock. Because everyone was in a rush to sell before the livestock died, the prices were generally lower. Yaffa (2013) emphasised that selling livestock reduces people's asset base and buffer capacity. Therefore, the women always lost out and remained poor and vulnerable to droughts. Lai (2007) noted that livestock act as an investment or insurance that smallholder farmers tap into during shocks but they tend to sell too late into the season before they die. Dercon (2000) pointed that if everybody wants to sell their assets, asset prices would collapse and the consumption that can be purchased with the sale of assets will be lower. Given that the women interviewed in Mudzi district perceived livestock as a means to buffer them during droughts, this created vulnerability as they lost all their livestock which were their own substantial assets. After droughts, the women purchased the livestock at higher prices than they sold them thereby creating a cycle of poverty.

5.3.5. Dietary changes

The women reported that they ate less preferred food and cut down on the number of daily meals they had during droughts. Masendeke and Shoko (2014) also found that prior to droughts; people change their consumption patterns by starting to reduce the number of meals they partake followed by

increased consumption of wild and famine foods such as leaves, rodents, and berries. Similarly, Valdés (1981) in his study in Ethiopia also found there are successive coping strategies taken during droughts, which start with reduced consumption per meal then reduced number of meals per day.

However, Lai (2007) pointed that eating less or consuming poor-quality food compromises household health and nutrition. Considering that children form part of the households, children's nutrition plays a role in contributing to their growth and development. Afridi (2010) pointed that early childhood interventions in children's nutrition have a significant effect on long-term educational attainment and cognitive ability. Thus, once they are deprived of good nutrition, the cycle continues through to adulthood. Carter and Janzen (2015) explained that under-nutrition worsens the poverty map by deepening the intergenerational transmission of poverty as the children and grandchildren of initially poor and vulnerable households tend to suffer long term deterioration in their realized levels of human capital. Yaffa (2013) found that hunger peaks coincided with the harvest season thus farm workers could not be productive on half-filled stomachs. When there is food insecurity, women find short term alternatives to cope with the situation. Women usually have to make the greatest sacrifices in terms of reduced quantity and quality of food consumption (Holmes & Jones, 2010). However, the recurring droughts in Mudzi district make women continue with these negative coping mechanisms such as dietary changes hence that become a normal way of living thereby affecting the health of the women in the long term. On the other hand, the quality of less preferred food is usually compromised and does not meet the basic standards of good nutrition.

5.3.6. Food assistance

All the women interviewed were considered vulnerable and were obtaining cash from World Vision as a way of coping with droughts. The cash that the women were obtaining was only $55 and in return they were working to build assets in the communities. It was found that the money obtained was utilised

for purchasing grains but the grains lasted three to four weeks depending on the size of the family. In cases where there were larger families such as nine people and above, the grains only lasted for two weeks. Receiving cash from NGOs is never sustainable as a way of surviving droughts as it meets the immediate need but after the project has ended, there is still need to survive which keeps the women vulnerable to droughts. According to Dercon (2000), a new safety net may benefit household actions, such as reducing self-insurance as well as increasing overall risk in the income activities portfolio.

Bryan et al., (2013) emphasised that food aid appears to enable poorer households to make more moderate risks, such as changing planting dates or adopting new crop varieties. Lai (2007) noted that food aid is a positive coping mechanism when it is short term and targeted towards vulnerable populations at appropriate times. He further stated that it is considered a negative coping mechanism when it develops into dependency. In Gambia, Yaffa (2013) reported that the amount of aid received from donors was insufficient hence there was need for extra income. Siyoum, Hillhorst, and van Uffelen (2012) echoed the same sentiments after their research in Ethiopia that found that over 60% of the households interviewed did not rely on food aid alone due to the small quantities of food distributed compared to their household needs moreover, the food aid arrived so late that they would have temporarily employed other means to survive.

In contrast to the study undertaken by Siyoum et al., (2012), a study conducted by Harvey and Lind (2005) found that there were complaints among community members that some people in Turkana district in Kenya had developed a dependency syndrome to a point that they would “eat and wait” for assistance to come. In a book entitled *Enough with Famine in Ethiopia* by Kiros (2005), dependency syndrome manifested at both national and household levels. This was emphasised by a quotation: “It doesn’t matter if the rain comes or not, as long as it does in Canada.

However, communities should not be deprived of humanitarian aid when in need; neither should continuous dependence be cultivated in communities thereby handicapping them. Thus, food assistance in Mudzi district met an emergency need whilst resilience projects were implemented to promote sustainability. In the next section, this Cash-for-Work project would be considered as an adaptation strategy as the women were building assets that were meant to make them resilient to droughts.

5.3.7. Interim summary

In analysing the coping mechanisms employed by the women interviewed in Mudzi district, what is consistent is the unsustainable nature of and the repercussions of embarking on these strategies. Selling vegetables, selling grass, and casual labour employment do not reward the women sufficiently to enable them to be cushioned from droughts in a sustainable way. The money they obtain from these activities does not amount to even half of the minimum required threshold for survival. Although the women reported that they sell livestock as a coping strategy, the researcher noted that the average number of livestock owned was even below the survival threshold which strained the women more. On the other hand, changing diets and cutting down meals affected the energy levels and nutrition of the women thereby affecting their health in the long run.

5.4. Adaptation Strategies and Women's Vulnerability to Droughts

Communities that are unable to cope (temporary adjustments in the face of change) or adapt (longer term shifts in livelihood strategies) are inevitably vulnerable and unlikely to achieve sustainable livelihoods (Scoones, 1998). It is not any and every adaption intervention that reduces poverty and inequality; some interventions may aggravate vulnerability (Eriksen et al., 2011). It is normal to temporarily adjust to droughts in drought-prone

communities as they face recurrent droughts. However, planning for the long term calls for a different shift in thinking; that perceives that there is need to make permanent changes in order to survive. Moreover, it calls for resources channelled into the community both externally and internally. Adaptation strategies in Mudzi district had not fully been embraced and applied by the women that were interviewed although there were frequent droughts. In this section, a number of promising adaptation strategies that some women in Mudzi district had been implementing are discussed. There is a potential to replicate some of the strategies yet others have some shortcomings that cannot be ignored as they contribute to women's vulnerability to droughts if they are not tackled.

5.4.1. Conservation farming

The women interviewed did not appreciate conservation farming although it was hailed among the stakeholders as a successful strategy in surviving droughts. Of the 17 women that were interviewed, only one practised conservation farming. Even though one woman was practising conservation farming, the process was not the full package recommended by agronomists. This was consistent with the findings of Kaumbutho and Kienzle (2007) that not all components of conservation farming were practised with the farmers who attempted to use it. However, for conservation farming to be successful there was need to fully incorporate all the components of 1) minimum or no mechanical soil disturbance; 2) permanent organic soil cover; 3) diversified crop rotations (Giller, Witter, Corbeels, & Tittonell, 2009; Kaumbutho & Kienzle, 2007; Knowler & Bradshaw, 2007). On the other hand, conservation farming was regarded as expensive for smallholder farmers due to the highly specialised inputs (Knowler & Bradshaw, 2007). Moreover, for it to be successful there was still need for rainfall to allow the crops to sprout or not to be distressed at the most important stages of their development. Thus, women who practised conservation farming in Mudzi district had to embrace the practice in full and also find ways to mitigate the rainfall stress at the most important

stage of crop development. Hartley and Zook (1916) reiterated that planting maize under drought conditions is largely a matter of taking chances with seasonal conditions though certain controllable conditions of soil and seed often determine the success or failure of the crop. Due to the expensive nature of the practice, intervention of local government and donors would have been of assistance. However, the local government did not have any financial resources to assist the local women which kept them vulnerable to droughts.

5.4.2. Productive asset creation

According to Swift (2006), food aid in relief programmes should be used not only to save lives but also to protect assets; in rehabilitation programmes, they should be used more explicitly to rebuild household and community assets, and to rebuild local organisational capability. There was a Productive Asset Creation project that World Vision was implementing which was meant to make the community resilient. At the time of the interview, it was work in progress and the women had not reaped the benefits of the assets that were being created but were earning $55 monthly which was used to buy grains and other non-food items. This project could potentially bring resilience to the women if it could be well-managed by the community. According to Bryan et al., (2013), in addition to providing a safety net following major climate shocks, more should be done to build the resilience of these communities for them to withstand future climate crises. Devereux (2001) highlights the need to provide different types of payment to different groups at different times of the year, for example, cash-for-work after a harvest, inputs for work in the planting season, and food-for-work in the hungry season.

Community ownership, beliefs, attitudes, and perceptions will play a role to make adaptation changes in the community. Kiros (2005) noted that the beneficiaries of food-for-work projects were only interested in the compensation and showed little interest in the development projects they

were involved in. It was observed in Mudzi district that the beneficiaries were only comfortable to work for four hours that they were paid for and did not put in extra hours for their community project. Although they were encouraged to work in their homes after the project, the attitude of regarding the project as a source of income rather than viewing it as a communal benefit, posed a challenge of whether the community could manage it and take ownership of it when the project managers had left. Ndlovu (2011) recommended that the expectation of physical labour should be reduced as food-for-work programmes erode people's ability to manage their domestic needs and to prepare their lands. Although this recommendation has good intentions, the context of successive droughts calls for external assistance in establishing resilience projects that would benefit the communities hence time and hard labour are demanded.

On the other hand, Mutasa (2010) highlighted that as much as food-for-work projects had good intentions, questions regarding the quality of work done was constantly raised; for example, the quality of roads constructed, which saw some being washed away as soon as the rains came. The quality of the work is not always questioned although mechanisms need to be put in place to ensure that assets built serve the Mudzi communities in the long term.

Power and gender dynamics could possibly hinder the women from benefiting fully from such resilient projects. It was observed that men did the most laborious work such as digging the fish ponds and dip tanks. Able-bodied women were responsible for carrying sand and stones. Elderly women looked after the young children. Due to the clear division of labour, this could possibly affect how the women would benefit from the income that would be derived from the project in the long term. A clear constitution that governs profit sharing after the donor has completed supporting the project would be beneficial however, there are still community, power and gender dynamics that still exist.

Mutasa (2010) pointed that the donor community did not inject adequately into developmental work despite calls to fund more development activities compared to humanitarian focus. This was exposed through donors' commitment of a paltry 2% (US$95,000) of the budgeted and requested sum of US$5,482,000 for sustainable livelihoods initiatives at the community level in the 2008 Community Action Plan. Asset creation projects promote resilience among the communities that are in drought prone areas as they supplement their local livelihoods which bring meagre income. However, community engagement is vital in selecting the projects to ensure that there is community ownership once the funds are injected for implementation.

5.4.3. Communal grain storage – "zunde ramambo"

According to Mararike (2001), zunde means a large gathering of people taking part in a common activity or may refer to plenty of grain stored for future use by people in a particular community. The objective of zunde ramambo is for the able-bodied members of the community to work together to produce food for the aged, disabled and the orphans (Stathers, Sibanda, & Chigariro, 2000). In some Mudzi communities, women stored a portion of their grains at the chief's homestead in order to respond to any impending drought. Masendeke and Shoko (2014) pointed that the challenges faced in the implementation of zunde ramambo emanated from delayed inputs and poor organisation of the communities by the kraal heads thereby making the concept ineffective. On the other hand, Mutasa (2010) reported that in Chikomba district, the communities suggested that both the concept and the traditional leaders should be depoliticised for it to be effective. Although this was not echoed by the respondents in Mudzi district, it is a major concern in Zimbabwe as politics overshadow such concepts.

In this study, there were reports that the chiefs squandered the community's agricultural produce reserves collected through the "zunde ramambo" concept which made the community members lose trust in the community

leadership. Mutasa (2010) also received the suggestion from the communities that corruption should be eliminated in grain distribution. Thus, power dynamics have a role in the communities therefore there is need for transparency and accountability in communal projects that seek to bring change in their livelihood strategies. On the other hand, Mudzi district was hit by recurring droughts so the quantity of grains stored was diminished thus it was not sustainable. Chiefs or local leaders are not immune to droughts, if faced by severe and recurring droughts, it makes them vulnerable too. Because of the power they possess in the communities, given an unfavourable environment, they are bound to abuse the power and become corrupt. Although the concept of communal grain storage is plausible, the context in which it is practised can either derive benefits or shortcomings.

Mapfumo, Mtambanengwe, and Chikowo (2010) noted that the introduction of food relief and aid schemes by non-governmental organisations and the central government has over time effectively eroded zunde ramambo, and weakened social cohesion for collectively addressing local problems. Although there is an element of truth about it, it is not entirely true because communities especially in rural areas were hard hit by a combination of recurring droughts, economic meltdown, and political instability thereby affecting their social cohesion. Even though a collective action to address the local problems could have been appropriate, the series of events in Zimbabwe made the majority of people vulnerable thus there was need for external assistance to ensure food security in communities.

5.4.4. Small grains production

The chief defense against food scarcity in Zimbabwe is the cultivator's skill whereby the staple crops such as millet (rukweza), rapoko, and bulrush millet (mhunga) are planted (Lliffe, 1990). Women in Mudzi district planted small grains such as sorghum and millet but on a small scale as their preferred crop was maize. The produce from these small grains was not

enough to sustain them the whole year or push them through the lean season. Their focus on extensive maize planting crippled their agricultural productivity as the region was semi-arid hence was not conducive for this crop. This kept the women vulnerable each time there was a drought which was very frequent considering that the rainfall was erratic.

According to Hartley and Zook (1916), in some seasons early rains and late droughts make good small-grain crops, while the maize crop fails. They further explained that when the conditions of moisture and drought are reversed, small grains may fail and maize can make a crop. In concurrence, the Department of Agriculture, Forestry and Fisheries (2010) indicated that crops such as sorghum require high temperatures for good germination and growth; moreover, they are grown in areas that are too dry for maize with annual rainfall range of 300 to 750mm. Although small grains production is promoted in semi-arid areas, a few farmers adopt it as an alternative to maize planting or complementary crop. The 2014 Zimbabwe Vulnerability Assessment report highlighted that the small grains were less preferred due to birds' attacks, highly intensive labour and their palatability that was unfamiliar. According to Eriksen and O'Brien (2007), one of the main challenges in implementing adaptation interventions aimed at reducing risk such as introducing drought resistant crops is that they require skills, capital or labour that poor households do not have.

Short, medium and long season sorghum varieties reduce the risk of complete crop failure (Manzungu, Senzane, & van der Zaag, 1999). Without the knowledge that there are different varieties of sorghum, it becomes problematic as the full benefits are not realized. Similarly, Dupriez and de Leener (1988), suggested that mixing many seed varieties of the same plant species can reduce the risk of crop failure because some varieties are early and others are late maturing and they react differently to drought. Adaptation calls for a shift of perceptions, behaviours, and attitudes thus as long as the women continue believing that the rainfall patterns will change

to their favour and do not consider any advice from agronomists, they will remain vulnerable to droughts.

5.4.5. Capacity building

Rocha and Christoplos (2001) emphasised the need for local capacity-building as a means of increasing resilience to natural hazard events, preventing disaster, and adapting to environmental and climate change. Allen (2006) categorised capacity building into four areas, that is, technical information dissemination and training role; raising awareness of risk and vulnerability; accessing local knowledge and resources; and mobilising local people. Although the government officials in question reported that women were being capacitated through skills and knowledge of adapting to droughts, the women interviewed did not implement climate-smart techniques, rather they focused on their conventional ways of farming. What women desired more was fertiliser and manure for their crops to grow yet the climatic conditions were not favourable. Even if the women were to receive the fertiliser and manure, this was not going to make a difference during droughts as what was needed more was a reliable source of water.

This raises the question of whether the training given to communities is relevant if the women are not able to apply the knowledge and skills they would have acquired. In Philippines, one interviewee claimed to have attended so many training sessions under various government and NGO initiatives that her memory was ‘blurred’ and she could not remember the content of the training she had undertaken a few months previously (Allen, 2006). NGOs and government stakeholders inject huge amounts of cash and human resources in building the capacity of the communities in adapting to droughts and in most cases; there are no complementary activities to allow application of the skills and knowledge attained.

Bhatt (1998) expounded that disempowerment takes place when disaster managers distort local people’s stories in line with their own understandings

and expectations, effectively devaluing local perspectives in relation to those of outside experts. Knowledge and skills shared in communities need to be contextualised and add value to the women receiving it. Although facilitators have good intentions to share knowledge and skills in communities, it should not be prescriptive as acceptability and application would be minimised. According to Dynes (1998), the community's most important attribute is its functional capacity to collectively identify problems, take decisions, act on them, and allocate resources. Communities have rich information that could be synchronised and be tapped into thereby changing their lives. Therefore, the knowledge and skills shared should be culturally relevant, acceptable and empowering to the women in order for them to be applied. Once-off training programmes that NGOs and government undertake without clear demonstration of the feasibility and resources to implement do not add value to women's adaptation needs.

On the other hand, on-going training programmes without inputs or resources to encourage implementation is counterproductive as the knowledge and skills will lie idle in communities with no utilisation. Thus, the NGOs and governments need to change their perceptions and attitudes towards capacity building in order for it to benefit these communities. Capacity building is central to make women resilient to droughts however, it is not enough in itself as issues of resources and the reception of the beneficiaries within a certain context is vital.

5.4.6. Planting dates changes

In Mudzi district, most women interviewed had either started planting maize in November or December in anticipation of late rainfall. This meant that the planting season had been shorter and it also stretched their hunger peak season as they would harvest late. In Kenya, it was found that changing planting dates was determined by having access to social safety nets (i.e. food emergency relief, food subsidies, or other farm support), access to extension services (in particular, farmer research groups or common

interest groups), and access to seasonal climate (Bryan et al., 2013). In contrast, Boansi, Tambo, and Müller (2017) found that group membership decreased the chances of changing planting dates, yet farmers with access to remittances were more likely to change planting dates to suit their seasonal schedule of operation. According to Tadross et al., (2009), the impact of rainfall variability on maize production is tied to the planting date and timing with respect to crop phenological phases. They further explained that rainfall characteristics that particularly impact maize growth during the germination phase, growth phase and ripening phase are: 1) long dry spells during the germination and growth phase which limits water availability; 2) high intensity rainfall during the germination which results in water logging; and during ripening which results in rotting and fungal infections.

According to Reason, Hachigonta, and Phaladi (2005), the onset of the rainy season is crucial to the timing of rain-fed crops: if a farmer plants too early, soil moisture will be insufficient for seed germination; if a farmer plants too late, intense rain might wash seed away. By changing the planting dates, the women hoped that they will avoid the long dry spells during germination which was a critical stage which determined the sprouting of the crops. However, due to the unpredictability of rainfall, it is a dicey situation as the rains can fall when people are unprepared or the rains can fall and cease at the most critical stages of growth. Thus early warning systems would be of great value to inform the women on when to plant their crops to increase yield. Fisher, Abate, Lunduka, Asnake, Alemayehu, and Madulu (2015) acknowledged that the main limitation is availability of accessible and accurate climate forecasts, which complement indigenous knowledge. With the El Nino impacting the Southern Africa region badly, more adaptation strategies that are independent of natural capital are needed to ensure that women are not severely affected by droughts.

5.4.7. Categorisation of responses

Table 8: Categorisation of Responses

Capital	Responses	Implications on Women	Enabling Environment
Natural Capital	Changes of planting dates	The rain might come earlier thereby disadvantaging women who would have been waiting to plant at a later date. If the rain ceases too early or does not continue for the maturation growth needed by crops, the crops fail.	Agricultural yield depends on the length of the rainy season and agricultural inputs
	Small grains production	Continuous planting of maize on a large scale resulting in low yields	Acceptability in the community
	Conservation farming	Continuous usage of conventional methods of farming resulting in low yields	The practise of all principles, availability of agricultural inputs and reliability of rainfall
Financial Capital	Casual labour	Family disintegration as members spend time looking for casual jobs	The frequency and demand of the labour; and monetary value derived from the labour.
	Petty Trade	Disinterest in expanding trade as the money derived is insignificant	The frequency and demand of wares; and the monetary value derived from the sales
	Vegetable sales	Stiff competition for sales might result in strained relationships and apathy	The frequency and demand of vegetables; and the monetary value derived from sales.
Social Capital	Food Assistance	If food assistance is taken as an entitlement rather than a short term immediate assistance, women will continue to rely on it and not find ways of adapting to droughts	Should meet short-term food security needs and merged with sustainable projects
	Productive Asset Creation	Due to the size of community members owning the assets created, women might not have direct control of the assets which might also affect their access to it if a proper constitution is not written.	Community ownership Good governance Equitable sharing of profits
Physical Capital	Selling Livestock	By selling the livestock late, the women sell at low prices and are left with no assets to fall back on.	Maximisation of profits Avoidance of depressed sales
Human Capital	Capacity building	Too much information with no resources to implement might result in apathy	Context-specific Availability of resources and willpower to implement

Source: Own (2018)

Table 8 shows the categorisation of responses that the women employed, the implications of such responses on women, and the enabling environment conducive for these responses to be successful. This table summarises all the responses that were derived from the data collected. Through analysis, different responses have implications for women in that if they are applied partially or in an adverse environment, they result in negative outcomes. On the other hand, some responses might not be acceptable or receptive to the women which has implications on them in that they will continuously practise conventional methods that perpetuate their vulnerability to droughts. However, an enabling environment can be created for women to flourish under these scenarios. These responses might not be unique to Mudzi district thus if the conducive environment is created, these might be successful in different contexts. When an enabling environment is capitalised, resources are channelled effectively thus behaviour change occurs. For every response that is employed, certain calculated assumptions and risks should be considered as these responses have implications on women, which define their success or failure.

5.5. Contribution of Attitudes and Perceptions towards Vulnerability

Vulnerability to droughts has been viewed from socio-economic, climatic and structural issues yet individuals contribute to their vulnerability too. In conversing with the women, government officials, men and the NGO officials, certain attitudes and perceptions towards droughts were deduced which contribute to the vulnerability of women to droughts. According to Tesser (1995), attitudes refer to very general evaluations that people hold of themselves, other people, objects, and issues. He further said that attitudes are based on feelings; beliefs and knowledge; and actions and that these bases can also have an impact on attitudes. Pickens (2005) defined attitudes as a mind-set or a tendency to act in a particular way due to both an individual's experience and temperament. One's attitude is determined

by a combination of their beliefs, personality, values, behaviours, and motivations.

On the other hand, Lindsay and Norman (1977) defined perception as the process by which organisms interpret and organise sensation to produce a meaningful experience of the world. Information is processed selectively based on one's beliefs, experience and attitudes (Pickens, 2005). Adger et al., (2009) pointed that individual adaptation hinges on whether an impact - anticipated or experienced, is perceived as a risk and whether it should (and could) be acted upon. They further argued that although perception operates at individual decision-making levels, it also constrains collective action.

Table 9: Attitudes and Perceptions Driving Vulnerability

Attitudes	**Perceptions**
We are not educated thus we do not have options other than agriculture	Fertiliser will boost our soil thereby giving us great harvests
Whether it rains or not, we only farm, that's all we can do	If we have a savings group from the cash we are receiving, what if next month WFP decides that there are no longer giving cash?
We need livestock so that we can sell during droughts	There is no business that we can do here – we are in the middle of the community.
We just sit and do nothing during droughts – we will be just struggling to make ends meet	
There is no way that you can prepare for droughts	

Source: Own (2018)

In this study, the women interviewed expressed an attitude of despondency with no alternative options to survive other than cultivating their land which was futile due to the unreliable rainfall as shown in Table 9. Lack of financial capital was the outcry for all the women that were interviewed. At the time of data collection, the women were receiving cash monthly for the Cash-for-Work project which they spent on cereals. Only a few women saved the cash which was however meant for subsistence utilisation and not for any income generating activity. The women were faced with the reality of a failed

economy and successive droughts yet others were finding opportunities in the middle of the crisis.

Although the women had some coping mechanisms that brought in little money, they perceived these as the only alternative mechanisms that could augment their failed agricultural production. On the other hand, the stakeholders that were assisting them to respond to droughts believed that training women in different activities would make them resilient to droughts. However, this was also futile as the women needed resources and reliable rainfall in order to survive the droughts. Thus, mixed attitudes and perceptions hindered women from building strong resources for their survival when faced with droughts.

5.6. Summary

The profiling of different capitals at a household level either reflects women's resilience or vulnerability to droughts. The assets that women in Mudzi district possessed could not cushion them from droughts neither did their responses shield them from being vulnerable to droughts. There was diversification of capital assets but what made the women vulnerable to droughts was that the assets were not valuable, neither were they viable. For example, selling vegetables could be viable in a context where there are market linkages and resources are injected to boost the profits. However, in Mudzi district, vegetable sales were on a very small scale yet many women practised it as a livelihood which resulted in flooding of the market with very low sales. If the women could organise themselves as a cooperative and establish viable markets, this could potentially result in a successful vegetable production business.

On the other hand, human capital could potentially shift the resilience of the communities if tapped into, especially if education, knowledge, and skills are prioritised to diversify the income. What is unique about the utilisation of human capital is that it is not limited to geography hence one can bring

remittances that can uplift a community. The benefits such as finances derived from human capital can be injected into the community hence building the communities' resilience to droughts. Social capital in drought-stricken areas with an ailing economy poses a challenge as networks are also not in a position to assist even though they might desire to. Thus, with the high unemployment rate in the country which is even worse in the rural areas, assistance within social networks is limited. The value placed on assets is contextual and for women in Mudzi district, the continuous dependence on rain-fed agriculture and highly preference of maize jeopardised their livelihoods. Even though the women in Mudzi district tried to diversify their livelihoods, they were not viable enough to curb vulnerability to droughts. Similarly, their responses to droughts stemmed from a weaker position thereby limiting their expansion and income diversification.

Skills and knowledge are abundant in Mudzi district but the application thereof is limited. The shifting of a mind-set requires a degree of constant learning and reflecting, and then one can apply their newly acquired knowledge and skills. This also brings the issue of the high prevalence of school drop-outs in the district and how this to a certain extent contributes to how the women are unwilling to apply new knowledge regarding climate smart agriculture and alternative livelihoods. Perceptions and attitudes of both women and the stakeholders need to be changed in order to allow the communities to change their behaviour and shift to sustainable adaptation strategies. The realisation and acknowledgement by stakeholders that despite the abundant knowledge and skills embedded in communities, little or no behaviour change is taking place should signal different strategies that bring success. Chapter 6 concludes this study and key recommendations are made based on the findings of this study.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1. Introduction

In this chapter, a conclusion and recommendations are presented and areas of further research are identified. Despite the recurrence of droughts, women in Mudzi district continue to rely on rain-fed agriculture and natural livelihoods which poses challenges on their livelihoods thereby contributing to their vulnerability. The purpose of this study was to explain why women are vulnerable to droughts in Mudzi district through analysing their livelihood strategies, coping mechanisms, and adaptation strategies. Three research questions guided this study and they are: 1) How are droughts affecting the livelihoods of women in Mudzi district? 2) How are rural women in Mudzi district coping with and adapting to droughts? 3) Why are women in Mudzi district vulnerable to drought? The thematic areas of livelihoods, coping mechanisms, and adaptation strategies and their contribution to the vulnerability of women to droughts are discussed. The emerging themes that reflect on application of training and issues of attitudes and perceptions in drought management are discussed. Reference is made to the conceptual and theoretical framework and how the findings of this research contribute to the body of knowledge.

6.2. Thematic Conclusions

6.2.1. Livelihoods diversification

Droughts have negatively affected the livelihoods of women in Mudzi district yet the main livelihood that the women depended on bore the worst brunt which is agricultural productivity. Despite the recurrent droughts in Mudzi district, women still continue to plant maize, hoping that each year would be different. Relying heavily on erratic rainfall and poor soils in Mudzi district kept the women vulnerable to droughts. Low yields from subsistence

farming aggravated the situation of the women as they did not have any surplus to carry them through to the subsequent planting season. The women did not derive any substantial financial capital from agriculture. Given the recurring droughts, there was no opportunity to recover thus deepening their vulnerability from year to year.

Human capital is essential as an alternative to depending on natural capital especially in drought-prone areas. If a woman has skills and knowledge that can be utilised to generate income; that gives her alternatives that can enable her to survive in times of droughts. Given the high school drop-outs and very low levels of education among the women in Mudzi, this entrenches them in a cycle of vulnerability. Zimbabwe boasts of 97% literacy rate yet Mudzi women still battle to make ends meet as they continue to drop out of school and not benefit from the education system. Literacy in itself which is defined as the ability to read, write, and apply numeric skills is not enough for countries such as Zimbabwe, as the competition for employment is stiff. Even in the informal sector, the competition to produce quality goods and services is crucial to enable one to make a living. Moreover, the women could not diversify their livelihoods as they did not have financial resources to embark on other activities. Credit facilities were non-existent in the communities and the savings clubs that existed were not capable of boosting the women to be self-sufficient as the amount of cash that they contributed was too little. Nonetheless, the savings were utilised monthly as there were more pressing needs to respond to.

It was found that even though there were well-bodied young adults and men, they did not contribute to the welfare of the families in some households. The young adults were unemployed and even burdened the families as they ended up impregnating girls from the village thus increasing the number of family members that needed to be taken care of. The men who had skills in carpentry and painting were confined in the villages due to high unemployment in the country thus could not provide alternative livelihoods

for their families. These skills were not on demand in the villages and did not pay handsomely as people were struggling to make ends meet. Some men resorted to staying at home whilst women worked for the families. This created double labour for the women as there were also demands for household chores which the men shied away from. Human capital from the family unit could have assisted in building resilience to droughts through joint utilisation of skills available to pursue alternative livelihoods. However, there was underutilisation of skills thus burdening the women and subjecting them to vulnerability to droughts.

The physical capital that women possessed was not enough to generate income that could be a fall-back measure in times of droughts. The livestock were too few and were hit by disease more frequently resulting in deaths. Selling livestock in times of droughts is seen as a negative coping mechanism (World Health Organisation, 1998). Hence the desire of women in Mudzi district to have more livestock could not be seen as a solution for creating wealth as they intended to sell them during droughts. Empowering the women to cushion themselves from the exposure of droughts is key to their economic development.

Diversifying contextually-valuable resources before, during and after droughts can enable women to be resilient to droughts. An analysis and deep understanding of a context breeds the deep-rooted culture of women that shapes their thinking, ways of doing things and how they respond to negative situations in their communities.

6.2.2. Translation of training into practical application

The government officials emphasised in their responses that they were training women on different adaptation strategies that are climate-smart, yet the majority of the women interviewed did not practise any of the climate-smart methods that the officials claimed to have been transferring to them.

Attaining knowledge and skills on how to adapt to droughts was emphasised by the officials yet women in the communities were not receptive to these. It was found that only one woman practised conservation farming at her own homestead out of all the women that were interviewed. However, even the one woman who practised conservation farming did not fully adhere to the principles that guide that practice. The community did not take seriously these suggested adaptation strategies as those who practised these strategies claimed that they were laughed at. This reflects the attitude that the women had about the skills and knowledge they received which actually hindered them from adapting to droughts.

On the other hand, the government officials confirmed that they did not have any financial resources to implement the skills that they were transferring to the communities. The government officials reported that they trained women on business management skills and how to form Village Savings and Loans groups. Without any form of start-up cash, this was not sustainable as an adaptation strategy as the women needed cash to inject into the small businesses. The perception of injecting knowledge and skills without resources, with the mind-set that the women will apply the knowledge, needs to be challenged at stakeholder level as it does not bring about any change in communities.

Although World Vision was distributing cash in the communities to assist the vulnerable groups, the aspect of saving had not been incorporated in the project design hence the amount that was given was absorbed by cereal and other food item purchases. Moreover, given that they earned $55 and the cost of living was high with a food poverty datum line of $154, the food barely met the basics of the households. The stakeholders should not assume that beneficiaries are able to make savings without refreshing the knowledge at the onset of a project that transfers cash to them and creating necessary structures to enable the saving groups to thrive.

It is therefore essential to do a participatory, community needs analysis and draw action plans based on the resources that are available so that when knowledge and skills are transferred, they can be applied at household level. It is not enough to transfer knowledge and skills without the resources to implement. Although it can be argued that the knowledge and skills can be utilised in a different environment in the long-term, given the current drought situation, women need an urgent action plan on how to adapt.

6.2.3. Women's responses to droughts

The research found that women employed weak, unsustainable response strategies to droughts hence this kept them entrenched in the cycle of vulnerability. Based on the 2015 Poverty Analysis report which cited that the national food poverty datum line for September 2015 was $154 monthly and the national consumption poverty line was $487 monthly for a family of five, the majority of the women were deemed very poor as they earned less than $50 which was supposed to cover all the household costs monthly. Without the food assistance that they were receiving from World Vision, they were barely surviving as they relied primarily on vegetable sales and casual labour during droughts which did not realise a lot of income that could sustain the families. Casual labour was an immediate source of income which brought the most needed grains yet it was not long-term as the families did not have alternative means of survival that brought enough income to last them the whole month.

In addition, the vegetable sales did not bring them sufficient income that could sustain them throughout the month as the market was flooded hence demand was low. Therefore they reduced the prices of the vegetables which lowered their profits. Along the Mudzi-Harare highway, women were observed competing for clients through forcibly surrounding any vehicle that stopped and even luring the clients through bargaining so that they could make sales. The merchandise sold was the same hence the competition was stiff. It therefore reflects that vegetable sales as a response to drought

could be strengthened if there are viable and reliable markets where the women could supply consistently. The challenge that existed is that only women who were close to a dam could plant vegetables but the scale was not large enough to constantly supply to markets.

Other responses that women in Mudzi district employed such as petty trade were not sustainable as cash circulation was a challenge. For a woman who does pottery to make huge income was next to impossible as the price of their merchandise was so low and the sales were sporadic hence, they could not consider that as a viable means of survival. As much as women tried to respond to droughts through reliance on casual labour, vegetable sales and petty trade, it was not enough to meet the $154 food poverty datum line. Even through the Cash-for-Work project, where they received the regular $55 for six months, much of that cash covered the much-needed cereals which in bigger families could not last a month. Strengthening women's responses to droughts through engaging them in identifying sustainable projects thereby giving them start-up capital could positively shift their lives and make them more resilient to droughts.

6.2.4. Attitudes and perceptions in drought management

Droughts are slow-onset disasters that can be managed from high level stakeholders to the community members affected. Decision-making on the approaches to adapt lie primarily with the community members although there can be external engagements that bring resources to boost the success of the strategies employed. The inclusion of women in the management of droughts is important as they are actively involved in agriculture. Negative attitudes and perceptions hinder the rolling out of drought response management as apathy leads the process. Moreover, efforts to engage in sustainable activities are hampered by negative perceptions that limit exploration.

The women in communities are full of knowledge and skills yet the application is limited due to how they accept the projects dictated to them. The stakeholders reported that they imparted knowledge and skills in business management and climate-smart agriculture yet the application of this knowledge was limited. Although in some cases, the women did not have finances to implement skills; where there was no need for resources, their attitudes and perceptions were questioned as it contributed to indifference. The women expressed negativity and hopelessness which led them to continuously practise agricultural systems that were not bringing tangible and sustainable results. On the other hand, they failed to accept that there was need to change based on the rainfall patterns. They were still expecting normal rains even though they were affected by droughts consecutively and this kept them vulnerable to droughts. Despite the knowledge that the stakeholders shared to help them adapt, their attitudes and perceptions hindered their responses.

On the other hand, stakeholders need to work together with communities instead of dictating activities and this emanates from the attitudes and perceptions they hold when they engage communities. As much as projects are proposed with good intentions, if the communities are not willing to participate in them because they do not see the value, it yields little. On the other hand, short-term projects with no continuation or proper sustainability or transition strategies create hope that fades as soon as the stakeholders have terminated the project. The Cash-for-Work project that was being implemented in Mudzi district was only for six months and beyond the six months, there was no continuation as funding was only for that duration. Although some of the projects are merged with existing projects, clarification on the management thereof is diffused which leads to failure or lower yields. Thus, it is important for stakeholders to assess their attitudes and perceptions when they propose projects in communities as this has implications on the acceptability and success of the projects.

In some instances though, there is need for full engagement by the stakeholders to give their technical advice as some responses might not work in certain contexts. The women might want specific projects which might not be cost-effective in the long-term; neither will they be able to achieve their purpose due to feasibility issues. Both the communities and stakeholders bring great wealth of knowledge and skills which are valuable if they are integrated in drought management. This can only be achieved if they all reflect positive attitudes and perceptions which will assist in appreciating each other's value in responding to droughts. Resources can be injected in communities but without the right mind-set, little can be achieved.

6.3. General Conclusion

This study found that women in Mudzi district are vulnerable to droughts because they lack financial capital to embark on other income generating activities. In addition, they have very low educational attainment thus the transference of skills and knowledge shared is very low. However, it should be pointed out that skills and knowledge shared with no resources to implement the newly acquired skills is futile. Therefore, there is need for an enabling environment for the skills to be utilised. On the other hand, low educational attainment limited the women from exploring other alternative options that did not rely on rainfall. Moreover, the women did not practise sufficiently long-term adaptation strategies; rather they relied on coping mechanisms which were usually weak or negative thus entrenching them in vulnerability.

It is important to acknowledge that Zimbabwe is confronted with economic and political challenges that trickle down to the ordinary citizens of the country. Nevertheless, issues of perceptions and attitudes painted a bleak picture of how women can be vulnerable to droughts. It was found that the

women exhibited an attitude of despondency whereby they did not consider other options other than farming because they felt that it was their only survival strategy. This resulted in the women continuously relying on rain-fed agriculture which was yielding little given the recurrent droughts. The women's perception of receiving fertilisers and owning livestock among other perceptions they held was ill-conceived thereby limiting their consideration of viable options to survive droughts.

This study is significant in contributing to knowledge as it reflects on how women select and make decisions on livelihood strategies, coping mechanisms and adaptation strategies. These strategies and responses are complex due to their limitations, negativity and weaknesses thereby entrenching women in the vulnerability to drought. Moreover, it brings an understanding of the vulnerability of women to droughts, not only from structural and community perspectives but from an individual standpoint. However, the role of institutions cannot be overlooked in understanding the vulnerabilities of women to droughts as policies and decisions on a macro-level impact the local women. This study reflected on droughts as an entry-point but what emerges is beyond the question of the vulnerability to droughts. Any hardships that women encounter can be reflected upon with reference to their responses. In addition, the elements of resilience cannot be ignored as they spring from how the women respond to droughts although the emphasis of this study is on the vulnerability of women to droughts. In the next section, the contribution to the body of knowledge is explained.

6.4. Contribution to the Body of Knowledge

6.4.1. General contribution to literature

6.4.1.1. Top-down reflection on responding to droughts

In order to adapt to droughts effectively, a number of factors need to be taken into account. From a top-down perspective, one question that should

be asked is: Who are the people we are dealing with? It is important to understand the dynamics of the people and this include power, gender, class, religion, and ethnicity. Women and men are unique thus their position in society can determine how receptive they are to outside influence. Their position in society can either be of positive or negative influence to development. In some cases, one's position in society can suppress their involvement in the development of a community. In Mudzi district, although the government stakeholders had authority in influencing the communities, with no financial resources to implement projects, their influence was invisible as recognition was given to the donor or organisation touching the lives of people.

It is also important for institutions to understand the intervention proposed to assist in adaptation to droughts. Has it worked before and is it relevant, appropriate and effective for the community identified? Will the community accept it or have they expressed interest in that particular intervention? Training women to adapt to droughts can be effective in certain communities if it is the most appropriate and relevant proposed intervention. However, in communities such as Mudzi district, training without resources to implement is counterproductive as the women might not be able to use their newly acquired knowledge and skills. Stakeholders need to self-assess their attitude and perceptions about the implications of the projects they propose for communities so that they change their approach in order to have sustainable responses to droughts.

The practice of conservation farming was not embraced at household level although the knowledge of such practice existed in the communities. Although it worked for the communal garden supported by World Vision where it was practised, it is due to the availability of resources that could support this thus it was easier to see results. At household level, with unreliable rainfall and little inputs, it was difficult to practise conservation farming. Therefore, it is important to have a top-down reflection on the four

components listed in Figure 15 when considering the interventions proposed.

Figure 15: Top-down Reflection on Responding to Droughts

Source: Own (2018)

Feasibility comes in different forms yet in adaptation to droughts, it is key to consider the aspects in the sustainable livelihood framework by Scoones (1998) and Serrat (2008) on assets and reflect on them in terms of feasibility by outward and inward looking. It is important to consider the feasibility of the project before, during and after implementation when the donors have handed over the project to the community. From a top-down perspective, issues of financial feasibility, social feasibility, human feasibility, climate-smart feasibility, political feasibility and the timing of intervention are important indicators of how responses to droughts can take off. Financial feasibility refers to how a community will be able to continue with a project without the injection of funds from external sources. The 2014 ZimVac Rural Livelihoods report pointed out that only 44% of all irrigation schemes in Zimbabwe were fully functional. Irrigation schemes could assist communities to have reliable water sources for their agricultural production

yet if there are no finances to service them; they benefit the communities in the short term and become a liability thereafter. Similarly, embarking on very small projects with no established market links such as vegetable sales or pottery sales is financially draining as there is little or no yield.

Social feasibility refers to norms, values, perceptions and attitudes of the people in communities that influence their behaviour as recipients of the adaptation strategies proposed in a community. Issues of power, gender relations and age differences need to be considered in formulating adaptation strategies. In Mudzi district, the young people who were not going to school were not involved in the community projects yet it is important to include them in the development of the communities. With no tertiary qualifications or vocational training, their inclusion would build them to be responsible in managing droughts. There are different social influences that contribute to the acceptance of projects in communities thus it is important to understand women and their social influences. Without tapping into these social aspects, it is difficult to implement any adaptation strategies or guarantee the sustainability of the strategies when the different stakeholders have left the communities. Thus, the issues of social feasibility need to be understood in order to have successful responses to droughts.

In Mudzi district, it was found that there was a very high number of school drop-outs and all the women that were interviewed, apart from one who had not grown up in the district, had not completed their secondary education. Even the children of the women interviewed had not stretched themselves to attain higher education thereby creating a cycle of a “partially-educated” community with little or no contribution to the macro-economy. Human feasibility looks at how communities are able to utilise their education, knowledge and skills in sustaining themselves. Do the people even have the good health needed to labour for their livelihood? From top-down reflection, it is important to understand this phenomenon as it also shapes one’s behaviour, perceptions and attitude towards adaptation strategies.

Zimbabwe had been under political siege since 2000 after the implementation of the land reform programme thereby crippling its economy. The political infighting coupled with a series of droughts damaged the country's agricultural sector, which negatively led to hyperinflation, unemployment, and food insecurity. In considering adaptation strategies, the political atmosphere has to be analysed as it affects external investments thereby jeopardising the recuperation of the communities from droughts. The external donor community normally drives the adaptation strategies through resource mobilisation. However, politics can hamper their interventions thereby leaving the vulnerable communities in quagmire.

The timing of intervention is equally important when looking at the feasibility of adaptation strategies. The women in the communities have seasonal calendars which they utilise to plough and plant crops. Interventions need to be timed appropriately for them to be effective. For example, training on saving groups needs to be paired with a project that actually distributes cash to communities rather than to incorporate it when the women are receiving food. On the other hand, training on conservation farming needs to be conducted just before the planting season for it to be practised. The timing of intervention gives room for the women to adjust with no excuse of resource constraints. Every opportunity that exists to coincide an invention with the availability of resources should be utilised.

Agriculture cannot be eliminated; given the recurring droughts however there is need to boost its success. The promotion of drought-tolerant crops was common in Mudzi district yet there was no full scale implementation. Changing planting dates did not guarantee that the rainy season will extend to suit the development phases of crops. This study found that most women were not aware of the existing early warning systems; in cases where they knew that drought was approaching, they could not protect themselves as they were struggling or did not take the early warning messages seriously.

On the other hand, the practice of conservation farming was not fully embraced in the communities the research was undertaken, neither was it the best adaptation strategy given the challenges it carried. Therefore, from a top-down reflection, there is need to look at climate-smart feasibility of the interventions proposed and if they would be accepted and succeed in a given context.

The motive for identifying certain projects for certain communities should be spelt out from the beginning to avoid conflict of interest. There are areas that are overinvested at the expense of very vulnerable communities. Despite the overinvestment, little tangible impact is derived from there. The researcher found that some projects are decided at office level without consultation with the people on the ground on exactly what would benefit them. The study revealed that World Vision tried more than three times to recruit beneficiaries for the Cash-For-Work project and ended up drawing any interested person that they bumped into because the people were not consulted from the beginning and this raises questions of the targeting approach. Although the proposals reviewed suggested that the communities were consulted in coming up with projects, there was no proof that this was done. The researcher found that donors stipulate what they need the funds to be utilised for, thus there is little room for NGOs to be creative. Moreover, there is a dictation of the geographic area targeted thus NGOs work within that framework thereby concentrating in some areas more than others. These factors should not be considered in isolation, rather there are linkages that should inform any decision making.

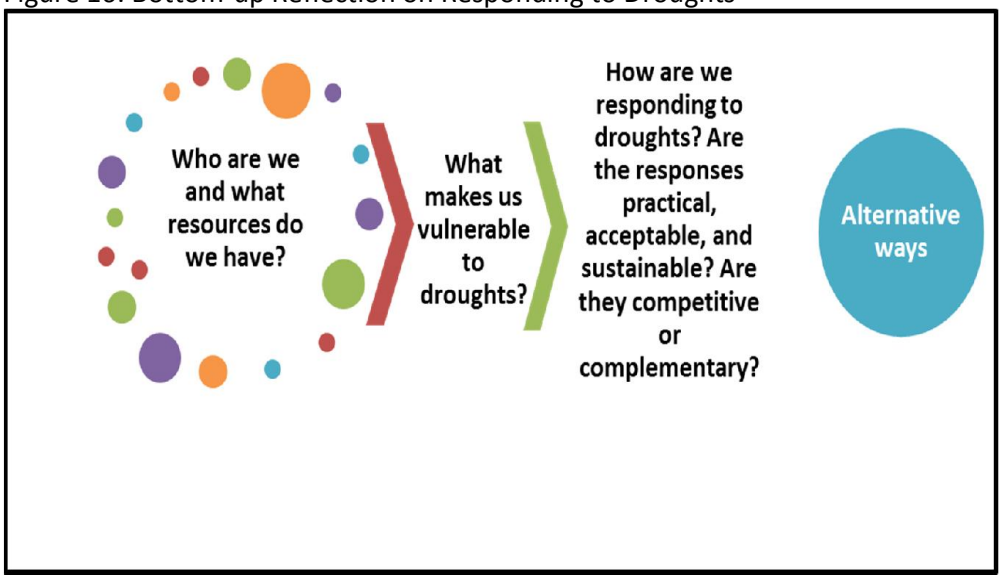
6.4.1.2. Bottom-up reflection on responding to droughts

Women affected by droughts need to be understood in order to assist them in responding to droughts. There is need for a bottom-up approach in reflecting on how to tackle droughts as reflected in Figure 15. It is important to understand women in their different categories when responding to

droughts, that is, marital status, social class, educational levels, financial levels and geographic location. How are the different categories hindering women from responding to droughts effectively? The social construction of the categories by women themselves creates opportunities that can enable stakeholders to understand their situation through their lens. It was found in Mudzi district that many women had very low educational attainments hence this subjected them to a vicious cycle of poverty as they had limited, unviable livelihood strategies. This also influenced their attitudes and perceptions on how to respond to droughts. Upon interviewing several women in Mudzi district, they reported that their parents could not afford to educate them and prioritised male children if the resources were available. This understanding from women's perspective assists in tackling issues from their construction.

Figure 16 shows that there is need to reflect on the assets and resources available to women when trying to respond to droughts. The sustainable livelihoods framework (Scoones, 1998; Serrat, 2008) and Hobfoll's theory on conservation of resources identify a number of assets and resources that can be available to communities and individuals. Although resources and assets can be available to a household, their value and stability within a context makes them to be counted as such. An analysis of these assets and resources in different contexts brings an understanding of their value, stability, interdependence, and sustainability. Diversifying less valuable livelihoods in an unstable context does not generate the much needed income that can make women survive the droughts. During droughts, an income, whether hard cash or in-kind, is an important tool that can be utilised to obtain cereals thus whatever efforts are made to diversify livelihoods, if the ultimate goal of generating income is not met, it would be futile.

Figure 16: Bottom-up Reflection on Responding to Droughts



Source: Own (2018)

In addition, projects should seek to redress the gender gaps that are embedded in communities rather than deepening them. It was observed that only women were involved in communal gardens thus subjecting them to vegetable sales, which is less lucrative. On the other hand, men were digging the fish ponds which if not managed, would create divisions of assets' beneficiaries with women only resorting to vegetables and men to lucrative fish marketing. This perpetuates the reproduction of gender-based vulnerability as women are confined to stereotyped work with less income.

On the other hand, understanding the needs of communities and drawing solutions has always been on the agenda of rural development. Participatory approaches have been central but they have not always produced the sustainable results that communities desire yet their emphasis has been promoted across rural development. In Mudzi district, what was apparent is that the women were hard hit by droughts and were very vulnerable to droughts as the area was semi-arid. It is easy to dictate what should be done in such situations from a top-down approach yet if it is not a practical and acceptable approach, the communities remain the same. Moreover, the issue of competition and complementarity needs to be

reflected upon when trying to adapt to droughts. Vegetable sales were a common response mechanism but flooded the markets. How could the women complement each other in the communities to ensure that there was prudent competition? If one is selling a tomato, what is the equivalent product that could produce the same income but not limiting the expansion of the business?

The context dictates the different ways of responding to droughts thus by women reflecting on themselves, they are guided to look at alternative ways. What works in Mudzi district does not work in Mt Darwin district thus there are no one-size-fits-all adaptation strategies. The study in Mudzi district embraced the different livelihood strategies and response mechanisms yet these responses did not produce the much-needed income for survival for the women hit by droughts. A quick solution of selling tomatoes along the highway is not what could change the lives of the women during droughts as the income generated was not substantial. The solution laid in understanding the women and what worked for them in their own context without ignoring the attitudes and perceptions which hindered them from changing their behaviour. Moreover, the changing of attitudes and perceptions of stakeholders towards responses to droughts and how they could work together with the women in responding to droughts was key in developing the communities. Thus institutions and individuals need to integrate and merge efforts in drought management.

6.4.2. Theoretical reflections

6.4.2.1. Resource conservation, diversification and investment

The conservation of resources theory states that people have an innate desire to conserve the quality and quantity of their resources and limit any state that may jeopardise the security of these resources (Hobfoll, 1988). Zimbabwe has been experiencing frequent droughts that are depleting the

existing resources thus it might be difficult to conserve resources in the long term if there is no regeneration of resources. Although there might be an innate desire, the situation might produce apathy and if left uncontrolled, there will be a cycle of vulnerability. In Mudzi district, the recurring droughts subjected the women to continuous vulnerability and that innate desire to conserve the resources was marred by negative coping mechanisms. Hobfoll (1988) listed 74 resources (refer to Appendix 1) and natural resources were not listed yet people in rural areas utilise natural resources more for their livelihoods. The physical resources that women value and desire in rural settings such as land, livestock, water supplies, agricultural inputs, and so forth were not included in Appendix 1 thus there is need to contextualise the resources to accommodate all settings. Most of the natural resources relied upon in rural settings depreciate in value as people continue utilising them without replenishment or boosting their value. The recurrence and intensification of droughts coupled with socio-economic challenges exacerbates the state of resources thus subjecting women to a cycle of vulnerability.

Hobfoll (1988) stated in the conservation of resources theory that people must invest resources in order to protect themselves against resource loss, to recover from loss, and to gain resources. In Mudzi district where the women rely on agriculture every year despite the recurrent droughts, investing in fertilisers and manure to enrich the soils is counterproductive. The environment itself does not permit such investment unless there is reliable rainfall or water supply that can be used to water the fields. The majority of the women interviewed did not have any valuable options to alleviate themselves from the impending droughts. The notion of investing resources needs to be qualified especially given the vulnerability context of women in Mudzi district. What kind of resources need to be invested and in what kind of environment should these resources be invested? At an individual level, the attitudes and perceptions of the women are critical in investing and protecting resources.

The major resource that women in Mudzi district value is soil which has lost its value due to the semi-aridness of the region. Continual practising of agriculture bears little yield as the environment is not conducive due to unreliable rainfall. Hence, there is need for valuable and sustainable livelihood diversification. If the women cannot establish other means of survival, what would be helpful is to ensure constant water supply to ensure that all the inputs that encourage good harvests are invested in the communities. In an ideal society, this would achieve good results; however, given that Zimbabwe is faced with multi-economic woes and the government has no resources to boost the agricultural sector, this is futile. To strengthen Hobfoll's premise, people must invest resources that are varied, valuable and viable in order to protect themselves against resource loss, to recover from loss, and to gain resources. Their attitudes and perceptions should also change to enable them to build investments that do not confine them to a cycle of vulnerability. Moreover, when there are interventions from stakeholders, their motives should be checked to create an enabling environment for change.

6.4.2.2. Planning for systemic changes

Systemic changes are comprehensive and "recognise that a fundamental change in one aspect for a system requires fundamental changes in other aspects in order for it to be successful" (Reigeluth & Garfinkle, 1994:3). Living in a drought-stricken area such as Mudzi district necessitates action to plan ahead, considering all the factors that subject women to vulnerability. Kelly (1968) in ecological theory stated that succession involves a long-term time perspective and draws attention to the historical context of a problem and the need for planning for a preferred future. Succession is an aspect that is practical in an ideal context however, looking at the women in Mudzi district, it would be considered that they are fully aware that there is a history of droughts and that the women have developed a subculture on how to respond. All the women interviewed acknowledged that there has been a

change of climate and that the soils are poor yet they still practised the same type of agriculture. Whenever options are limited, it is difficult to think of other ways of survival. Lack of resources compounded with negative attitudes and perceptions perpetuate vulnerability to droughts as this intensifies apathy. There are some resources that are stronger than others hence it is not the amount of resources that one has to invest in but the value of the resources and the willingness to explore other untapped areas. Vegetable sales are an option for survival in Mudzi district but they do not give substantial profit as most women rely on the same form of livelihood hence the market is flooded.

It is therefore important to qualify the premise from Kelly (1968) that one can plan for a preferred future given an understanding of their historical context. Understanding the historical context without the resources to manage the situation in future cannot secure a better future. Moreover, positive attitude and perceptions promote behaviour change in communities. Droughts are a natural disaster and are bound to affect the economy as agriculture is the backbone of most developing countries in Africa. Thus for an economy that is ravaged, the most vulnerable groups suffer more as they lose the natural capital that they depend on for multiplying their financial resources. Because they primarily depend on natural capital, and the economy has no capacity to augment their financial capital, there is need to find alternative means that can boost their livelihoods.

To strengthen Kelly's premise, the researcher qualified the statement: succession must involve having a long-term time perspective and understanding of a historical context of a problem then consider the stability of the socio-economic and political environment in planning for a preferred future. In addition, having positive attitudes and perceptions on self and the need to escape poverty, enable behaviour to change towards sustainable responses to droughts. Moreover, possessing valuable resources enables one to plan for a preferred future given a conducive context. Droughts can

be tackled through application of systemic changes that focus on the socio-economic and political environment, individual, community and the changes in climate. Focusing on partial angles cripples the overhaul of the entire system as there is interdependence between an individual and her environment.

6.4.2.3. Gender, power relations and institutions

This study found that the underlying cause for continuous reliance on agriculture despite its failure is lack of alternatives which can be understood by analysing the gender gaps existing in the communities brought about by power relations. Patel and Hochfeld (2011) consider women as agents of change who use the available resources to bring change in their lives instead of being victims. This study acknowledges women's efforts in utilising available resources; however, it is not enough to bring transformation in their lives and break the intergenerational vulnerability that stems from power and gender relations. The conservation of resources theory does not consider gender gaps, power relations and the role of institutions which confine women in the vulnerability cycle. This is shown through the data collected which points out the gender biased livelihood strategies, coping strategies and adaptation strategies which perpetuate levels of vulnerability. For example, although the asset creation project was intended to benefit the communities, there was a clear division of labour by gender thereby confining women to the stereotyped forms of labour and assets that maintained their position in the community. Moreover, the male-headed households derived more income from livelihood strategies that they engaged in compared to females who were either married or widowed.

On the other hand, this study found that married women had a better advantage in coping with droughts than the widows as their partners employed stronger livelihood strategies that brought more income to the households. Moreover, the married men that were interviewed generated

more income from the activities they practised and had skills that could potentially pay them handsomely if the economy was conducive. Moser (1993) argued that it should not be assumed that households headed by women are poorer than those with male heads. Nonetheless, Flatø, Muttarak, and Pelser (2017) concur with this Mudzi study's finding that households headed by widows, never-married women, and women with non-resident spouses are particularly vulnerable to weather events and climate-related disasters. Evidence from Mudzi district shows that widows are disadvantaged as the culture does not encourage them to explore alternatives without the validation of men due to power relations in communities thus subjecting them to vulnerability. "*There is nothing else that we can do if there is no rainfall. We just sit. We are always struggling during droughts. Right now, we are grateful that World Vision came to assist us*," uttered Phoebe, interviewed on 19 August 2015. In contrast to these utterances, male-headed households consider other options, for example, Grace, interviewed on 25 August 2015, stated "*My husband thatches houses and carves hoes' handles (kuveza mipini) and these give us at least $40 monthly. In addition, I obtain between $20 and $30 from vegetable gardening*."

Having joint income sources cushioned married couples from the effects of droughts as they planned together. Thus, strong marital relationships enable women to be more resilient to droughts if there is joint ownership and allocation of resources. In an effort to redress gender inequality, men should consider themselves as partners and beneficiaries, thereby making collaborative decisions (Farnworth, Stirling, Chinyophiro, Namakhoma, & Morahan, 2018). However, Moser (1993) claimed that unequal exchange and inequality exist within households such that even though there might be sharing, this does not necessarily mean that an equal distribution of resources occurs. The married women interviewed admitted that they owned everything jointly with their husbands and they budgeted the income derived from their livelihoods together without disadvantaging each other.

This could be due to the little resources they obtained that could not be stretched outside the family unit with no agreement. Nonetheless, in a Kenya study, Ndiritu, Kassie, and Shiferaw (2014) found that making joint decisions in a household strengthened input use, improved adoption of climate-smart technologies, and underpinned a more equitable distribution of benefits within a household. Thus, in households where partners pull resources together to achieve a common goal, there is much success in toppling challenges.

In reality, Haycock (2004) indicated that in most cases, access to agricultural land is gained through marriage and forfeited through divorce proceedings. In rural settings such as Mudzi district, women move into their husbands' homesteads which are usually family homes thus whatever the land they own does not belong to them technically, although they have access to the land as part of the family. Thus, if they are divorced, they leave even the homes that they would have built together with their husbands to restart their lives with nothing substantial. Similarly, for widows, unless they decide to remain at their deceased husband's homestead, all is lost. The uncertainty of land ownership poses a risk to women even though they might enjoy full benefits in marriage. Chao (1999) found that the uncertainty about land rights and tenure discourages women from investing in and taking up long-term use of land. In this study, widowed women were more vulnerable to droughts than the married women. Despite possessing small pieces of land, the production was very low due to inadequate financial capital to purchase inputs and poor agricultural practices as a result of low educational attainment.

The choice of livelihood strategies proposed by different institutions hinders women from realising their potential as they maintain and propagate the income differentials between men and women. The promotion of less lucrative income generating activities creates a generation of vulnerable women. World Bank (2001) indicated that putting additional income in the

hands of women results in a larger positive impact on intergeneration sustainability. Therefore, promoting and supporting women in engaging in lucrative income generating activities benefit the families in the long term. On the other hand, Chant (2008) argued that targeting women or "feminising" anti-poverty programmes can sometimes increase women's burdens as their roles and responsibilities are intensified within and outside the household. Literature has proven that most governments, especially in developing countries, do not prioritise the empowerment of their people (Ferguson, 1994; Pons-Vignon, 2011). The study found that although the government attempted to transfer skills to the women, without any resources, this was futile. Empowerment must be hinged on the transference of skills thus an enabling environment such as the provision of resources is imperative. Young (1997) reiterated that the organisation of women in local communities is a precursor of organisation at higher levels thus this increases their political power within the economic system. Women need to participate in political arenas for their voices to be heard and attempt to make the governments that represent them accountable. The women in Mudzi district already understand their plight hence they need to make deliberate efforts in changing their story through actively participating in institutional reforms that promote equality and development of the communities not only verbally but practically. Although managing droughts start from within the household, the government needs to make efforts to protect its people through moving from policies to action and learning from other countries.

In addition, institutions such as NGOs need to prioritise the needs of the communities they serve without putting their own motives first. Power dynamics that exist between communities and institutions subjugate the advancement of communities. According to Serote, Mager, and Budlender (2001), for any development strategies to make a difference to women's lives, they need to consider how power relations are gendered and address them in order to improve the quality of life of women and of the community

as a whole. Although communities are engaged in project designs on paper, great influence which is subtle emerges from the funders. According to Islam, Sallu, Hubacek, and Paavola (2014), institutions can restrict or open up opportunities for livelihood strategies. Dictation of interventions cloud the innovation of beneficiaries hence the proposition of numerous training programs without evaluation of their success serves the interest of the institutions more than the communities as they need to continue to receive funding from donors to meet their operational budgets.

The ecological theory can be strengthened by considering gender gaps that exist and how institutions hinder change. A preferred future needs to be considered within the parameters of gender equality, institutional reforms, and power distribution. Institutions that hinder women from realising their full potential need to be reformed thereby putting in place mechanisms to monitor and evaluate the changes. Gender, power relations, and poorly governed institutions impede women from protecting themselves against losses that result from droughts.

6.4.2.4. Social cohesion

This study found that most women are barely making it hence social support is not fully permissible; one cannot fully rely on social capital in times of droughts. Although Adeola (2003) criticised the conservation of resources theory for leaving out social capital, Hobfoll (1989) posited that social relations are seen as a resource to the extent that they provide or facilitate the preservation of valued resources. Social capital can be understood in three dimensions; that is, bonding, which refers to horizontal ties between similar individuals; bridging, which links a group to one across thereby forming connections to external assets; and linking, which refers to formal networks which possess various forms of institutionalised power or authority (Maxwell et al., 2016). In promoting social capital, Wiggins and Keats (2013) indicated that companies preferred organised groups than smallholder

farmers due to the costs involved in making small deals. Social relationships can experience fatigue and withdrawal if tapped into constantly without reciprocation or regeneration of resources. NGOs try to assist in times of droughts but it is not sustainable as they also rely on donor funding, which is not always available given the deteriorating economic climate. Social cohesion was limited due to the widespread socio-economic challenges which further deepened the vulnerability of women to droughts.

In contrast to this research, Ngwira (2015) found that there was an insurgence of informal community-based networks that assisted in times of need and these included flourishing savings groups in Lesotho and Malawi. Without any form of credit or loans to build alternative sustainable livelihoods, the women in Mudzi district were entrenched in a cycle of poverty. They could not borrow from each other as they felt that were all struggling, neither could they trust each other to build each other through savings groups. Maxwell et al., (2016:66) found that "in hard times, social connectedness may be strengthened, but the functions of social networks may also break down." Solidarity in the face of droughts enables the communities to draw resources together in order to build sustainable livelihoods. Kaniasty and Norris (1993) found that persons with limited financial resources and weak social support networks struggled more than those with stronger social networks. Weak social networks hinder and undermine "ubuntu" which unifies groups.

6.4.3. Reflection on the sustainable livelihoods framework

The sustainable livelihoods framework by Scoones (1998) and Serrat (2008) guided the main concepts of this study, that is, vulnerability context, livelihood strategies coping mechanisms and adaptation strategies. This study brings the elements of gender with a focus on women and climate variability with a special focus on droughts. Women are intertwined with droughts as they are at the forefront of agricultural production. The sustainable livelihoods framework ignores the contribution of individuals'

attitudes and perceptions for behaviour change to transpire. An individual's attitudes and perceptions shape how he or she responds to droughts and the livelihoods they choose. In fighting against HIV/AIDS, attention was focused on behaviour change as it is pivotal in ensuring that people do not just learn but shift their thinking and actions thereby reducing new infections. Thus it is important to consider perceptions and attitudes in trying to assist women in adapting to droughts. The victim mentality and "always receiving hand" needs to be tackled.

By listening to women's stories on how droughts have affected them and how they are responding to them, a clear picture of their attitudes and perceptions is derived. It is important to understand that communities are affected by droughts by and large yet responses differ from one household to another. The severity levels are also different from one household to another. What is intriguing is that despite the recurrent droughts, there is no behaviour change that considers other alternatives that the agricultural extension workers or NGO promote in the communities at household level. Knowledge and skills have been transferred to the communities for a long time yet there is little or no application thereof. Although financial resources might be a limiting factor, the attitudes and perceptions of the women need to be considered with regards to how they view the external assistance and the proposed interventions.

It was found in this study that the physical resources possessed in rural areas are not always enough to cushion the women from the negative effects of droughts as they cannot be easily converted into substantial cash. The number of livestock owned by the women in Mudzi district are below the survival threshold and considering that they are sold during depressed times; they do not fetch a substantial income that can be sustainable. When the women sell their livestock, they are left with no other physical resources that can be marketable. Thus they are left more vulnerable as they will attempt to purchase additional livestock at exorbitant prices. It is the stable

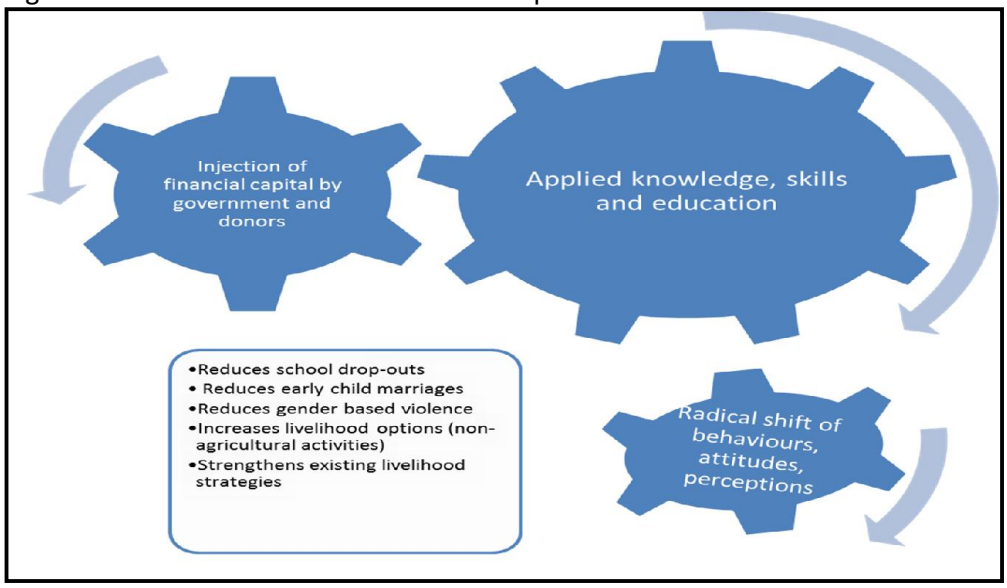
households that sell livestock that would have been bought during distressed times at very high prices due to high demand. Thus, the poor women will remain impoverished while the stable households benefit from a system that discourages poor women to think of alternatives of selling their only physical resources that can potentially boost their livelihoods.

What therefore stands as an alternative is human capital which can be tapped into, which produces some form of livelihood during droughts. If a woman has some skills and knowledge that can be transferred and utilised elsewhere, that can boost financial resources for a family. Investing in human capital as a means to curb droughts in rural areas seems to be a more viable means of creating better, sustainable livelihoods. In the industrial age, skills can generate money as they can be utilised elsewhere and the remittances are transferred back into the communities. According to the World Bank (2001), lower education levels make females less likely than male farmers to adopt new agricultural technologies that may increase farm productivity. Continuous reliance on agriculture as the main source of livelihood is detrimental given the successive droughts occurring. Although there is promotion of conservation agriculture in the drought-prone communities, a few women are practising it as evidenced in the study carried out in Mudzi district. Therefore, investing in skills and knowledge with a conviction that they will be utilised successfully and diligently can assist in promoting sustainable livelihoods.

This study, however, revealed that none of the households had young adults that were self-sufficient or assisting the families thus putting more pressure on the women to provide for them. According to White, Otero, Lycette, and Buvinic (1986), households who have higher dependency ratio and a lower participation rate among potential earners, as well as earners with less income-earning power, all too often fall below the poverty line. The focus on girl children to continue in school does not only benefit the families of the girls but eliminate teenage daughters-in-law especially in rural settings. The

pressure of raising a teenage daughter-in-law, grandchild, and unemployed son was expressed as a challenge among the interviewed women. On the other hand, in a number of households, although there were men available, the women led in the sustenance of the families. The men stayed at home whilst the women worked hard to provide for the families, which brings a different dimension of marital advantage of joint work. Some men had skills that they could utilise for alternative livelihoods such as carpentry and painting but did not use the skills due to the economic woes that did not attract such skills. Human capital provides an entry to drought resilience if the family unit works together to boost the livelihoods. Unemployed youth who bring additional family members through unplanned pregnancies drain the resources available to a household. It is the women who bear the burden as they ensure that the whole family is provided for with the little resources available.

Figure 17: Towards Utilisation of Human Capital to Create Resilience



Source: Own (2018)

Figure 17 shows that in order for women to be resilient to droughts, there is need for cash injection by the government and donors to apply the knowledge, skills, and education acquired in capacity building. There is so much knowledge and skills in the communities, but without any resources to implement it, it becomes useless and redundant. It can be argued that in

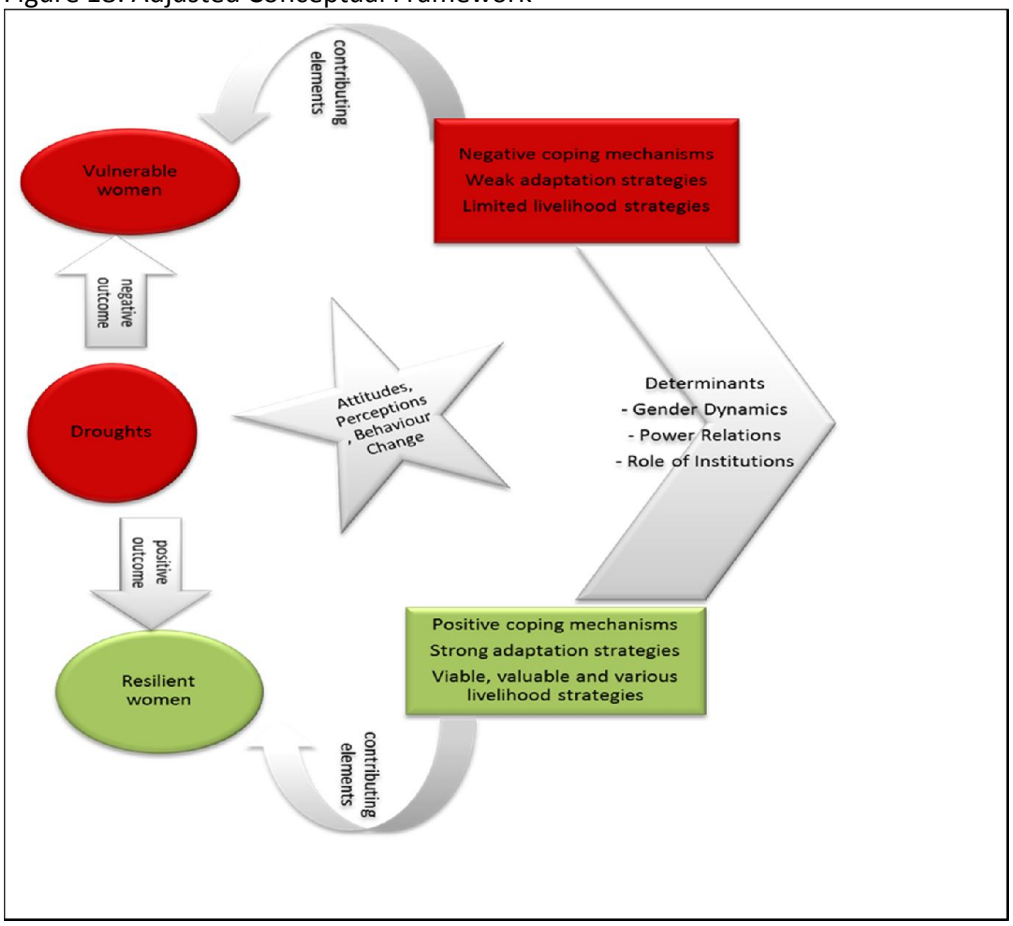
contexts where the cash is injected, there are no tangible results thus bringing the element of intentional monitoring, evaluation, and learning by institutions with the intention to improve communities through tangible and sustainable results. It is important to review the monitoring and evaluation processes to ensure that they are effective, efficient and utilised. This area could be explored in further studies to find linkages between good programming and utilisation of monitoring and evaluation processes.

On the other hand, a radical shift of attitudes and perceptions might curb the social ills that communities face such as early marriages, gender-based violence and school drop-outs that are not linked to financial constraints. How can this radical shift occur in communities that have been submerged under such social ills? A clear message across the communities that roots out perpetrators of gender-based violence in a radical manner can possibly shift the status quo. The creation of an enabling environment that encourages girls to remain in school and forgo early marriages might build strong human capital which is necessary for alternative livelihood strategies beyond agriculture. This calls for a radical shift of behaviours through changing attitudes and perceptions which in turn promotes the utilisation of human capital in creating resilience to droughts.

Accepting that reliance on rain-fed agriculture is futile and shifting to other alternative non-agricultural activities requires external messaging and injection of financial capital to promote other viable options. Apart from the financial injection, government policies that promote alternative non-agricultural activities in rural areas should be sound and protect women as drivers of rural development. An enabling social, economic and political environment needs to be created thus motivating women to shift their way of conducting business. Without dismissing the existing livelihood strategies, women can be encouraged to expand on them through the creation of a conducive environment.

It is the different institutions that can work alongside the communities to create an enabling environment thereby addressing issues of power, gender relations, and feasibility of projects. An integrated approach, that entails working with women from a bottom-up and top-down angle, encourages the involvement of both women and institutions in building resilience to droughts in a non-threatening way. Power from institutions dilutes and impedes acceptance of projects in communities. Thus, approaching communities as partners of development than recipients of short-term projects allow relationships to grow thereby reducing vulnerability to droughts.

Figure 18: Adjusted Conceptual Framework



Source: Own (2018)

In line with Figure 6, the adjusted conceptual framework in Figure 18 maintains the main concepts that guided this study which are droughts, women, livelihood strategies and responses. Nevertheless, Figure 18 brings

new parameters that were informed by what emerged from the findings of this study thereby shaping the conversations in drought management. The new elements that have been added are issues of attitudes and perceptions and how they contribute to behaviour change. Behaviour change is an important element that brings new conversations in the understanding of droughts as it draws attention to the vulnerability or resilience of women to droughts through the way they respond. In addition, the underlying determinants of gender dynamics, power relations and the role of institutions such as NGOs and governments have been flagged as they contribute to how women respond to droughts.

Negative coping mechanisms, weak adaptation strategies, and limited livelihood strategies contribute to the vulnerability of women to droughts. However, it is the women's attitudes and perceptions that drive their behaviour to continue utilising negative responses to droughts thereby perpetuating their vulnerability to droughts. Although there are structural elements such as socio-economic, political and environmental influences, the individual contributes significantly in defining her responses to droughts. However, institutions remain liable to the communities they serve in formulating sound policies and ensuring that projects are implemented effectively thereby benefiting the marginalised people. In sum, behaviour change is crucial in building women's resilience to droughts as it determines their choice of livelihood strategies and responses to droughts.

6.4.4. Behaviour modification in droughts

Droughts are a common phenomenon yet how women react or respond to them determines their vulnerability or resilience. When communities are faced with droughts, some flourish even after losing their livelihoods and assets. In contrast, there are members of the same communities, whose livelihoods and assets are lost with no recovery, hence creating a vicious cycle of vulnerability. This study found that the lack of viable livelihood options due to inadequate financial capital and low educational attainment

is a breeding ground for the vulnerability of women to droughts. However, there are people who find other options to survive droughts despite these challenges which bring the issues of attitudes and perceptions. According to the health belief model*, "in order for behaviour to change, people must feel personally vulnerable to a health threat, view the possible consequences as severe, and see that taking action is likely to either prevent or reduce the risk at an acceptable cost with few barriers" (Nisbert, & Gick, 2008:297).* Similarly, Morris, Marzano, Dandy, and O'Brien *(*2012) proposed that change is considered more likely to occur and to be sustained as the amount of reflection about specific behaviours or issues increases.

In relation to droughts, although the women in Mudzi district feel the effects of droughts and take action, this study reveals that the response strategies are negative, weak and had limitations thus subjecting them to vulnerability. There is a full understanding of the repercussions of adopting negative behaviour as one continues experiencing the consequences of continuous reliance on rain-fed agriculture. Bostrom and Fischhoff (2001) suggested that people also need feedback and encouragement about their behaviours. The feedback might be apparent yet changing the behaviours could prove an insurmountable task as reality hits. Due to the semi-aridness of Mudzi district, the women rely on food assistance every year as droughts hit the area recurrently. Receiving food assistance every year could possibly drive the women to consider other options for survival as they are buffered from losing their assets yet in some cases; all it does is create a dependency syndrome. There was a general sentiment among the women that without food assistance, there were little options for them to survive which brings the issue of dependency syndrome.

The theory of planned behaviour suggests that the intention to act is a best predictor of behaviour (Fishbein & Ajzen 1975). Moreover, according to the reasoned action approach, changes in behaviour can be brought about by changing people's intentions to perform the behaviour in question (Ajzen &

Albarracín, 2007). Nisson and Earl (2015:3) noted that "*behavioral intentions are determined by attitudes towards the behavior (e.g., whether engaging in the behavior is evaluated to be positive or negative), subjective norms surrounding the behavior (e.g., beliefs about whether others think one should engage in the behavior), and perceived behavioral control (e.g., beliefs regarding how easy or difficult performing the behavior is likely to be*)." A state of hopelessness that emerged from the women because they did not have any alternatives apart from farming and that there was no way they could prepare for droughts paralysed any intentions to adapt. The intention of the women to act against the negative responses to droughts could pave way to changes in the communities. Henceforth the attitudes and perceptions of the women towards their position in the face of droughts need to be understood in order to deal with any behavioural issues that hinder change. Resources can be injected into communities yet poor people still remain poor in these communities. Thus, an understanding of women's perception of droughts and the challenges that they face assists in defining the angle of intervention.

This study demonstrates that women who are vulnerable to droughts are defeated in their thinking and behaviour. They expressed despair and resignation when faced with droughts. Although they had established coping mechanisms, they were still faced with challenges on how else to survive as the droughts were becoming successive. Their coping mechanisms were temporary and could only benefit them for a season hence there was need for adaptation strategies that could build their strength to be resilient to droughts. Accepting that reliance on rain-fed agriculture in a drought-stricken area is detrimental to yields and finding other viable and valuable options is a starting point to behaviour change. In the self-efficacy behavioural theory, Bandura (1997) emphasised that self-efficacy perceptions affect how people think, behave, and emotionally react. Women have the power to change their circumstances through changing how they perceive situations. The defeated mind-set that states that "*we only wait for*

the rains for our survival because we have no options" as echoed by Tecla, interviewed on 25 August 2015, should be challenged as it yields nothing but continued vulnerability.

According to the diffusion of innovation theory, behaviour will change more rapidly if innovations are perceived as being better than previous options (relative advantage) and consistent with the existing values, experiences and needs of potential adopters (compatibility), if they are easy to understand (complexity), testable via limited trials (trialability) and their results are visible (observability) (Morris et al., 2012). In applying adaptation strategies, these factors that promote behaviour change should be considered. However, application of adaptation strategies such as conservation agriculture and drought-tolerant crops has not been so successful in Mudzi district despite its success in some areas which brings the issue of context.

On the other hand, the institutions that assist the communities such as NGOs and the government need to understand the communities they work with in a broad and integrated approach. Morris et al., (2012) argue that how do-able something is, relates in many ways to how widespread it is across society - how much it is known as do-able, recognised or practiced. The findings of this study illustrate that as much as some adaptation strategies are widespread, the nature of the communities and how the institutions transfer the knowledge contribute to their uptake. It is through behaviour change that the institutions will be able to derive positive results from the interventions that they implement in the communities. Training people without resources is counterproductive and imposing projects that worked in different contexts does not always yield the same results.

Some interventions perpetuate the existence of gender imbalance thus there is need for intentionally streamlining aspects of gender in the design and implementation of projects. Although the Cash-for-Work project was

designed to meet the immediate need of food assistance whilst simultaneously creating assets, the gender components were not strengthened thus maintaining or deepening the gender inequality in the communities. Moreover, implementing short term projects that have an asset creation base does not generate the needed long-term impact and it raises the aspect of sustainability beyond the project period. Although one can argue that the projects can be streamlined with existing projects in the communities, this is not guaranteed as little or no follow up is done from the donor. In addition, the modalities of intervention continue to be narrowed down mainly on natural capital which is under threat due to unreliable rainfall. Although there is modification of agriculture through mechanised irrigation, the question of the cost of servicing the machines in the long term is not considered. Behavioural change at the institutional level is important as questions of appropriateness, relevance, timing, acceptability, motives, and feasibility map the direction of the projects thereby reducing the vulnerability of women to droughts.

In attempting to explain the vulnerability of women to droughts, the propositions in the COR theory and ecological theory had limitations as they were based on assumptions thereby falling short in elaborating the parameters in which these theories could be applied. For example, the COR theory proposition that “people must invest resources in order to protect themselves against resource loss, to recover from loss, and to gain resources” assumes that the resources being invested are valuable enough to meet the long-term needs of the people. Although there were responses in Mudzi district, these did not shield them from being vulnerable to droughts which brings the criticism of the COR theory. Similarly, the premise in the ecological theory that “succession involves a long term time perspective and draws attention to the historical context of a problem and the need for planning for a preferred future” is presuming that the socio-economic and political environment is conducive; and the people are willing to make changes.

Failing to acknowledge the existence of power relations is a limitation that hinders the explicit application of the COR theory and ecological theory in this study. On the other hand, assumptions are problematic when confronting reality as they ignore the contribution of behaviour in the selection of coping mechanisms and adaptation strategies which have a bearing on the vulnerability of women to droughts. The elements of behavioural change were generated from this study hence it is pertinent to incorporate behaviourism in understanding and explaining the vulnerability of women to droughts as this is relevant in shaping the drought discourse. Although the COR theory and ecological theory modelled this study, the elements of behavioural theories have a stronger interface in understanding the vulnerability of women to droughts hence should be considered in drought management.

In strengthening the conservation of resources theory and ecological theory, this study brings the behavioural change aspect in understanding droughts at an individual and institutional level. This study reflects on the vulnerability of women to droughts by unpacking the livelihood strategies, coping mechanisms, and adaptation strategies. In understanding these parameters, what emerges as the underlying driver of vulnerability is the lack of viable alternative options which points to the role of institutions, gender imbalances and power relations. A cycle of vulnerability to droughts among women is perpetuated, which is exacerbated by poor educational attainment and financial capital. These factors need to be considered in the conservation of resources theory and the ecological theory with the realisation that behaviour change is crucial in responding to droughts.

Thus for any behaviour change to occur, certain conditions need to be considered in the context of droughts in reference to both communities and the stakeholders that assist communities. Firstly, it is important to accept the situation and acknowledge that this might be the new normal. This calls

for changed attitudes and perceptions of the self and the situation. Acceptance of a situation with a mind-set to change one's behaviour to thrive within that environment is crucial. It eliminates despondency thus pushing one to act. Although stakeholders have accepted and acknowledged the recurrence of droughts, their involvement in the communities should change to allow sustainable development. An assessment of motives shed light on attitudes and perceptions and this might require external feedback. Secondly, finding viable, varied and valuable alternative options and embarking on them is essential. Acting with an intention for success surpasses random acts that are unsustainable. Boundaries that limit the execution of alternative options need to be tackled. Both stakeholders and communities need to work together in identifying and applying alternative options that bring success in a sustainable way. Thirdly, communities learn from each other and from outsiders hence learning can be cultivated to allow replication of essential skills and knowledge. Moreover, learning from the situation challenges one's behaviour in the future as they have a reference point. Stakeholders must promote learning through constant engagements with communities and encourage cross-learning in other similar contexts. Lastly, a constant awareness of the changes that occur with an attitude to adjust drives the need for adaptation. Changes are continuous and cyclical thus need to be embraced and acted upon.

6.5. Significance of the Study

- The study is significant as it responds to the National Gender Policy to have gender disaggregated data in relation to climate variability and change in Zimbabwe.

- The call to have gender specific responses to climate variability issues can inform policy making that seeks to address socio-economic factors that contribute to the challenges women face due to droughts.

- Vulnerability is contextual hence by focusing on Mudzi district, the lessons generated can be used to guide reflections in similar contexts.

- This study brought out the social construction of women's vulnerability to droughts based on their livelihood strategies, coping mechanisms and adaptation strategies hence advocating for a more effective approach of responding to droughts through their own lenses. Over-reliance on natural livelihoods that are easily affected by droughts coupled with weak responses pose a challenge in many rural areas in Zimbabwe. Many communities use short term survival strategies when confronted with drought yet mapping adaptation strategies that focus on a longer term should be encouraged through their own voice.

- The ecological theory was reflected on regarding the issue of planning for a preferred future thereby drawing lessons on why this is not applicable in some contexts hence strengthening this theory thereby contributing to the body of knowledge.

- The conservation of resources theory was reflected on regarding resource investment and how issues of gender, institutions, power relations, attitudes and perceptions contribute to how resources are invested thereby contributing to the body of knowledge.

- The sustainable livelihood framework was reflected on regarding two components of climate variability and gender which were not adequately addressed in the framework when it was developed. There are gaps in reflecting upon behaviour change components and how this contributes to the vulnerability of women to droughts.

6.6. Recommendations

6.6.1. Theoretical recommendations

i) The conservation of resources theory posits that people must invest resources in order to protect themselves against resource loss, to recover from loss, and to gain resources. Weak, varied livelihoods in rural areas do not derive sustainable income; rather valuable, varied and viable livelihoods within a stable political, socio-economic context derive sustainable income during droughts. The combination of valuable, viable and various resources is a better investment than having weak, unsustainable diverse resources that have little or no value. Thus, I recommend that the theory considers the value and viability of the resources in different contexts. In addition, the theory can be improved by considering the implications of gender and power relations in resource investment through bridging the gap that exists between men and women in accessibility, allocation and availability of resources.

ii) The ecological theory illustrates that succession involves a long-term time perspective and draws attention to the historical context of a problem and the need for planning for a preferred future. I recommend that issues of attitudes and perceptions of the people be considered as they play a great role in influencing their behaviour in planning for a preferred future. A radical shift of attitudes and perceptions among men and women in drought-prone areas promotes behaviour change through the application of training, knowledge, and skills shared in adapting to droughts. Moreover, the context determines how people plan for a preferred future. An enabling environment stimulates the expansion of different responses to droughts thereby strengthening them to create sustainable adaptation strategies. In addition, the ecological theory can be improved on by considering the role of institutions in effecting change on the community level which can trickle down to the lives of

women. As much as people on the household level might attempt to improve themselves, with no sound policies due to poor governance, it becomes difficult to plan for a preferred future as they are affected by any changes effected at an institutional level. Moreover, women's vulnerability to droughts is perpetuated by the gender gaps that exist which to a large extent are contributed to by the institutions that hinder change or promote the status quo.

6.6.2. Operational recommendations

- Young women must be encouraged to acquire skills that can encourage them to be either self-employed or find gainful employment through the Ministry of Youth Development. This will likely increase the chances of the families to have remittances that can support them in times of droughts when there is little agricultural production. Start-up resources should be accessible and available for young women and continuous support should be given to ensure sustainability, considering the changing political and economic environment.

- Women must be encouraged to participate in decision-making arenas and form part of local governance to ensure that their concerns are addressed at a higher level through a quota system in drought management. By prioritising women's voices in the communities, projects tailor-made to suit their needs are bound to be a success. Women's participation promotes positive behaviour in drought management.

- Usually, women's resources are of little value due to their position in the economy thus an effort should be made in redressing the gender gaps that exist in resource allocation, availability, and accessibility. By understanding the gender inequalities that exist; corrective measures with proper action plans, performance monitoring and evaluations in a given time-frame should be prioritised. In addition,

there should be deliberate efforts in addressing attitudes of undermining women in any forms of work and how the women perceive their role in development.

- Droughts are a recurring phenomenon which call for learning from countries such as Israel that are innovative hence the need to orchestrate engagement at the higher macro-level. Institutional engagement in drought management provides a basis for policy making which might result in implementation with the assistance of sound performance management systems.

- Despite the climate smart agriculture training that the women received, a handful of women practise climate-smart agriculture. There is need to explore local knowledge on how they perceive the training, the support they need to apply the skills obtained, and how they can better utilise new knowledge in their context.

- Some women interviewed belonged to savings club but none of them invested in a sustainable livelihood that could generate more income that could cushion them from droughts. It is therefore recommended that women should be encouraged to adopt business models that are sustainable based on market assessment.

- Flooding the market with one commodity such as vegetables reduces the amount of profit one makes hence there is need to vary the commodities supplied and identify new markets that the women can be linked to. It is also important to ensure that women are not confined to gender-stereotyped livelihoods that bring meagre income by exposing them to viable markets.

6.7. Areas of Further Research

This study found that women in Mudzi district continuously rely on agriculture despite the successive droughts in the region. Although the

government had been promoting conservation farming, a few women were practising it; also, they preferred planting maize every year instead of drought tolerant crops. Their livelihoods base was highly concentrated on agricultural productivity which made them more vulnerable to droughts and they did not have any sustainable adaptation strategies. The coping mechanisms were linked to the natural resources which did not envelope them from the dire effects of droughts. Where they practised casual labour as a coping mechanism, little income was realized which meant that they were constantly living in a cycle of hand-to-mouth. Areas that can be further investigated in light of the findings of this study are:

- The successes and failures of promoting conservation agriculture among women in drought-prone areas
- The significance of formal education in the adaptation strategies employed by women in drought-prone areas
- Casual labour as a coping mechanism of droughts: the wins and losses of women
- The influence of attitudes and perceptions in selecting adaptation strategies in drought-prone areas in multi-case studies
- The resilience of women to droughts: contribution of livelihoods and adaptation strategies

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Appendix 1: Hobfoll's List of Resources (COR Theory)

Work Resources: 1. Necessary tools for work 2. Positively challenging routine 3. Status/ seniority at work 4. Stable employment 5. Role as a leader 6. Acknowledgement of my accomplishments 7. Understanding from my employer/boss 8. Support from co-workers 9. Advancement in education or job training 10. Help with tasks at work	Personal Resources – Self Esteem: 11. Feeling that I am successful 12. Sense of pride in myself 13. Feeling that I am accomplishing my goals 14. Ability to communicate well 15. Feeling that I know who I am 16. Positive Feeling about myself	Personal Resources – Mastery: 17. Feeling that my future success depends on me 18. Feeling that I have control over my life 19. Ability to organise tasks 20. Sense of commitment 21. Self-discipline 22. Motivation to get things done 23. Feeling independent	Personal Resources – Well-Being: 24. Hope 25. Sense of optimism 26. Sense of humour 27. Feeling that my life is peaceful 28. Knowing where I am going in my life 29. Feeling that my life has meaning/ purpose
Material Resources: 30. Personal transportation (car, truck etc.) 31. Adequate clothing 32. More clothing than I need 33. Necessary home appliances 34. Housing that suits my needs 35. Adequate food 36. Larger home than I need 37. Adequate home furnishings 38. Providing children's essentials 39. Extras for children 40. Savings for emergency money 41. Financial assets (stocks, property etc.) 42. Financial stability 43. Retirement security (financial)	Energy Resources: 44. Time for adequate sleep 45. Free time 46. Time for work 47. Time with loved ones 48. Stamina/ endurance 49. Personal Health 50. Medical insurance 51. Money for extras 52. Adequate income 53. Adequate financial credit 54. Money for transportation 55. Money for advancement or self-improvement (education, starting a business) 56. Financial help if needed	Interpersonal Resources – Family: 57. Good marriage 58. Family stability 59. Intimacy with one or more family members 60. Good relationship with my children 61. Children's health 62. Intimacy with spouse or partner 63. Spouse/ partner's health 64. Help with tasks at home 65. Help with childcare	Interpersonal Resources – General: 66. Feeling valuable to others 67. Intimacy with at least one friend 68. Companionship 69. Affection from others 70. People I can learn from 71. Involvement with church, synagogue etc. 72. Loyalty of friends 73. Involvement with organisations with others who have similar interests 74. Health of family/ close friends.

(Source: Hobfoll, 1988)

The list of resources above is derived from Hobfoll's conservation of resources theory and is important in understanding the assets that households deem important depending on the context. These resources form the baseline for data collection on vulnerability and livelihood strategies although the importance placed on these resources is contextual. Therefore, these were utilized to complement the capital assets that the sustainable livelihoods framework focuses on although the issue of context needs to be emphasized and the value placed on each by different people.

Appendix 2: Consent Letter

Dear Research Participant

As part of the requirements for Doctor of Philosophy degree at University of Witwatersrand, I have to carry out a research study. The study is concerned with analysing the vulnerability of women to droughts in Mudzi district. The study will involve face to face interviewing, observing the landscape and households, and reviewing documents relevant to the study. You have been asked to participate in this project because you meet the sampling criteria. Participation is voluntary and you have an option to withdraw before the study commences or discontinue after data collection has started. Any data collected will be destroyed if you wish to discontinue from the study. The data will be kept confidential for the duration of the study.

On completion of the thesis, the data will be retained for five years and then be destroyed. The results will be presented in the thesis and will be seen by my supervisor, and an external examiner. The research may be read by future students and might be published in a research journal. I do not envisage any negative consequences for you taking part in this study. If you need any further information, you can contact the University of Witwatersrand, Wits School of Governance. If you agree to take part in the study, please sign the consent form overleaf.

Appendix 3: Consent Form

I……agree to participate in Tendai Chigavazira's PhD research study. The purpose and nature of the study has been explained to me in writing. I am participating voluntarily. I give permission for my interview with Tendai Chigavazira to be tape recorded. I understand that I can withdraw from the study, without repercussions, at any time, whether before it starts or while I am participating. I understand that I can withdraw permission to use the data within two weeks of the interview, in which case the material will be deleted. I understand that anonymity will be ensured in the write up by using pseudonyms. I understand that disguised extracts from my interview may be quoted in the thesis and any subsequent publications if I give permission below:

(Please tick one box:)

☐ I agree to quotation/publication of extracts from my interview

☐ I do not agree to quotation/publication of extracts from my interview

Signed……..

Date……..

Appendix 4: Permission Seeking

The Permanent Secretary

Ministry of Gender, Youth and Employment

Zimbabwe

REQUEST FOR PERMISSION TO CONDUCT RESEARCH

Dear Madam

My name is Tendai Chigavazira, and I am a PhD student at the University of Witwatersrand in Johannesburg. The research I wish to conduct for my Doctoral Thesis involves the analysis of the vulnerability of women in Mudzi district. This project will be conducted under the supervision of Dr. Horacio Zandamela (University of Witwatersrand, South Africa).

I am hereby seeking your consent to collect data through the review of your reports on women.

I have provided you with a copy of my thesis proposal which includes copies of the consent forms to be used in the research process, as well as a copy of the approval letter which I received from the University of Witwatersrand Research Ethics Committee. Upon completion of the study, I undertake to provide the Department with a bound copy of the full research report. If you require further information, please do not hesitate to contact me on tendai.chigavazira@gmail.com. Thank you for your consideration.

Yours sincerely

Tendai Chigavazira

University of Witwatersrand

Appendix 5: Ethics Clearance Certificate

Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)
R14/49 Chigavazira

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: H15/08/08**
PROJECT TITLE	The vulnerability of rural women to droughts in Mudzi district, Zimbabwe: Complexities of livelihood strategies and responses
INVESTIGATOR(S)	Ms T Chigavazira
SCHOOL/DEPARTMENT	Wits school of Governance/
DATE CONSIDERED	21 August 2015
DECISION OF THE COMMITTEE	Approved unconditionally
EXPIRY DATE	15 September 2018

DATE 16 September 2015 **CHAIRPERSON** _____
(Professor J Knight)

cc: Supervisor : Dr H Zandamela

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10005, 10th Floor, Senate House, University.

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to completion of a yearly progress report.**

_____ _____/_____/_____
Signature **Date**

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

Appendix 6: Semi-structured Interview Guide

A. Women and Men

Name:	**Age:**
Highest Level of Education:	**Years lived in Mudzi:**
Marital Status:	

I. Livelihoods

Natural Capital

1. In times of droughts, how much do you produce and what do you use it for?
2. When you harvest, who gets the biggest share of what you cultivate?
3. What do you think of the quality of your soil and water?
4. How much do you depend on land, soil and water in times of droughts?
5. How much of the produce you make goes for selling or storage or use in the house?

Financial Capital

1. What is your main source of income every month?
2. How far does this stretch you every month?
3. Who provides for the family?
4. What are the alternative sources of income in times of droughts? (Trigger family remittances, gold panning, NGOs)
5. How much are you saving from your total income?

Social Capital

1. When do you normally request for help from your neighbours or relatives?
2. What kind of assistance do you receive from your relatives or friends?
3. Compared to previous years when droughts occurred, what kind of changes do you see in the way your family or friends assist you?
4. What could be the reasons for behaving in this way?
5. What kind of groups exist do you belong to and how do they assist you in times of need?
6. What challenges do you face during droughts in the way you relate to your neighbours and friends?

Physical Capital

1. Who owns the land that you cultivate?
2. What rights do you have to that land?
3. Do you have easy access to the land?
4. What else do you own apart from land? (trigger tractor, home, scotch cart, livestock)
5. Where do you get water from for daily use and during droughts, are there alternatives you use to water your gardens?
6. What kind of equipment do you own as an individual and as a family?

Human Capital

1. How many people are in your household?
2. Please list their gender and age.
3. Who leads the household financially and make decisions?
4. In the past year, have you spent money on medical bills and how has this affected your monthly income?
5. To what level did the household members attain education and is there someone who has post-secondary qualifications?
6. What kind of skills and knowledge do they have and has this been helpful in opening new work opportunities?
7. In times of droughts, how have different skills and knowledge assisted the household in obtaining extra income?

II. Coping and Adaptation

1. During droughts, how do you cope? (Trigger social, financial, natural, physical and human capital)
2. When there are no droughts, what mechanisms do you put in place to ensure that when droughts come, you will be prepared?
3. How do you find your preparation in anticipation of droughts assisting you to survive?
4. What hinders you from adapting to droughts?
5. What ways do you think can assist you to become better in preparation for droughts?
6. What makes you not practice those ways?
7. In times of droughts, how do you survive?
8. What works very well and what needs improvement in the way you cope?

9. What existing structures are there in the community that assist you in times of droughts and how useful are they?
10. How do you know when the next drought is coming?
11. Over the years you have lived here, what has changed in the way you respond to droughts?

III. Vulnerability

1. Who makes major decisions in your household and what kind of decisions do they make?
2. What types of crops do you plant and which months do you plant these crops?
3. What other projects do you do and how easy is it to obtain credit for your projects?
4. What are the challenges that you face in making a living?
5. What strengths do you have in mitigating the effects of droughts?
6. What weaknesses do you think make you vulnerable to droughts?

B. Stakeholders Semi-structured Interview

1. How long have you been working in Mudzi district?
2. What changes have you seen in climatic trends?
3. What role do you play in reducing the impact of droughts in the communities?
4. What activities do you implement to assist in reducing the impact of droughts on women?
5. What criteria do you use in selecting your beneficiaries in the projects aimed at adapting to droughts or coping with droughts?
6. What are the key challenges you see as affecting women during droughts?
7. In your experience, how are different types of assets affected by droughts? (trigger physical, social, financial, human and natural)
8. What measures are you taking as an institution in assisting women in coping with droughts?
9. What measures are you taking as an institution to ensure that women are prepared to resist the negative effects of droughts?
10. What are the factors you have identified as threatening women in responding to droughts?
11. What has worked successfully in responding to droughts?
12. Any other comments?

Appendix 7: Observations Guide

Topography

1. What is the appearance of the soils, land, rivers and dams?
2. Is there any evidence of soil erosion?
3. Are the trees cut?
4. Is there any evidence of water sources?

Livestock

1. What livestock is owned and the quantity?
2. How do the livestock appear in terms of health and body mass?
3. Where is the livestock feeding from?

Livelihood Strategies

1. Is there any evidence of natural capital, social capital, and physical capital?
2. What are the different capitals telling you?
3. What activities are the women and men doing?

Household

1. How is the interaction between men and women?
2. Who seems to be leading the family?
3. What kind of structure are the houses and any visible sign of affluence or vulnerability?
4. Any boreholes, irrigation systems, water reservoirs visible?
5. Any food gardens in the yard?
6. If there are pets, how do they look?

Appendix 8: Documents Review Guide

Documents	Themes
The Ministry of Women Affairs, Gender and Development report	Livelihoods of women and men
The Ministry of Agriculture - Crop and Livestock Assessment reports 2002/2008/2009/2012	State of agriculture and development in relation to climate variability
Proposal and End of Project Report (September 2015 Food For Work project)	Responses to droughts Assessment of vulnerability
2002/2009/2013/2014/2015 Zimbabwe Vulnerability Assessment Committee Rural Livelihoods Reports	Assessment of vulnerability of women and men
2015 Poverty Analysis Report	Poverty statistics
2015 Market Assessment report	Assessment of vulnerability of women and men