AN INVESTIGATION INTO FARMERS' GENDERED COPING AND ADAPTATION STRATEGIES TO DROUGHTS IN OLUKONDA CONSTITUENCY, OSHIKOTO REGION IN NAMIBIA

A THESIS SUBMITTED IN PARTIAL FULFILMENT

OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS IN GENDER AND DEVELOPMENT STUDIES

OF

THE UNIVERSITY OF NAMIBIA

BY

ROSIDA DAPEWA PELEMA

200406566

APRIL, 2018

SUPERVISOR: DR ARTWELL NHEMACHENA

ABSTRACT

This thesis is a result of a study carried out to determine farmers 'gendered modes of adaptation and coping strategies to droughts and how these modes of adaptation can lead to gender inequality in times of droughts in Olukonda constituency in Oshikoto region. The northern regions of Namibia experienced severe droughts in the 2012/2013, 2013/2014, 2014/2015, 2015/2016 seasons. In Oshikoto region where this research was undertaken, the impact of droughts on livelihoods was more pronounced on agriculture and food security with about 13,481 households becoming food-insecure after most of their crops were destroyed by drought (Oshikoto regional council, 2013). The study adopted a qualitative research design, in which interviews and focus group discussions were employed to collect data. The study revealed that droughts had devastating effects on the lives and livelihoods of the inhabitants of Olukonda constituency. The farmers in Olukonda constituency indicated that their main mode of adaptation to droughts is the drought relief food which is distributed by the government in times of drought. Notable in the study was that no human life was lost due to droughts but the farmers lost most of their livestock. This study sought to generate knowledge about a community where there are some knowledge gaps, and it tries to identify and explore the link between gendered adaptation to droughts and other important fields such as gender roles, gender equality in adaptation and gendered coping strategies to droughts. The study concluded that droughts have a diverse impact on the human basic needs of the inhabitants of Olukonda constituency. The study recommends a plan of action involving the Oshikoto regional council, the Government, the Disaster Risk Management Department and the affected community to find a lasting solution to droughts and to come up with gendered adaptation strategies that can benefit the people of Olukonda constituency.

TABLE OF CONTENTS

Chapter 2 Literature Review

ACKNOWLEDGEMENTS

I would like to thank the Almighty God for giving me the strength to complete this thesis. I thank the government of the Republic of Namibia, which through the Ministry of Gender Equality and Child Welfare granted me the financial support and the opportunity to study. I would like to thank the Department of Sociology and the School of Postgraduate Studies of the University of Namibia, for initiating this study. I would especially like to thank Dr. Artwell Nhemachena for the supervision and guidance. His patients and support made it possible for me to complete my MA in Gender and Development studies.

I would like to express my gratitude to my family, most especially my husband Mr. Hofni Iyambo, my son Leopoldt Iyambo, my mother Christa Herman and to all my siblings for their help and encouragement during the course of the study.

Let me also thank the community of Olukonda constituency especially the people who took time off their work to be part of my study. I would also like to thank the regional councilor of Olukonda constituency Mrs. Victoria Shikongo for granting me permission to do my research in Olukonda constituency and for assisting in the selection of the participants for the study.

Lastly, I would like to thank my colleague Luucina Alphews for the encouragement and support. To my friend Emma Katumbo and Hulda Shikale thank you so much for the motivation to finish this thesis

DECLARATION

I, Rosida Dapewa Pelema, declare hereby that this study is a true reflection of own research, and that this work, or part thereof has not been submitted for a degree in any other institution of higher education.

…….. **……..**

Rosida D. Pelema **Signature**

LIST OF ABBREVIATIONS

APESS – Association for the Promotion of Livestock in the Sahel and Savannah

CARE – Cooperation for Assistance and Relief Everywhere

CIDA – Canadian International Development Agency

CDKN – Climate and Development Knowledge Network

CDM – Clean Development Mechanism

DCD – Community Development Committee

DSW – Department of Social Welfare

DFID – Department of International Development

FAO – Food and Agricultural Organization

FGD – Focus Group Discussions

GGCA – Global Gender and Climate Alliance

IPCC – Intergovernmental Panel on Climate Change

MDGs – Millennium Development Goals

MFPED – Ministry of Finance, Planning and Economic Development

NGOs – Non-Governmental Organisations

SDC – Swiss Agency for Development and Cooperation

SLF – Sustainable Livelihood Framework

UNDP – United Nations Development Programme

WID – Women in Development

WHO – World Health Organisation

LIST OF TABLES

CHAPTER 1

1.1 Introduction

1.1.1. Orientation of the study

This thesis seeks to explore how men and women of Olukonda constituency adapt to droughts. The coping and adaptation strategies to droughts that men and women employ were examined, as little is known about how men and women in Olukonda are adapting to droughts. It was also necessary to examine if there has been a transformation in gender roles caused by the impacts of droughts and to look further into how women and men's coping and adaptive capacities vary among them. This was an exploratory study which made use of qualitative phenomenological research to reach an interpretive understanding of the gendered adaptation to droughts

This thesis also examined the link between gendered adaptation to droughts and other important fields such as gender roles, gender equality in adaptation and gendered coping strategies. It was important to examine if there is a link between these concepts because gendered adaptation is not a standalone issue; therefore it should not be treated in isolation. Consequently gendered drought adaptation should be addressed together with other issues such as the changing gender roles, gender inequality in adaptation, and the coping strategies. In addition, the issue of gender equality in drought adaptation is worth considering when developing long term gendered adaptation strategies, particularly because it contributes to human wellbeing, livelihood and the people's quality of lives (Schipper, 2008). Therefore, it is essential that adaptation strategies to future events in Olukonda constituency should consider both the variability of gender roles and gender equality.

Women and poor communities are the groups of people who are most vulnerable to the impacts of droughts (Aguilar, 2009, as cited in Dankelman, 2010). Droughts affect gender roles because rural men and women in these vulnerable semi-arid areas experience the impacts of droughts differently. In the Olukonda constituency in Oshikoto region, Namibia, where I conducted my research, it has been confirmed that there has been some inconsistent rainfall patterns, droughts and shortened crop growth seasons. These environmental changes particularly threaten women because they challenge their survival techniques, work-loads, adaptation strategies and vulnerability during adverse circumstances.

Evaluating rural men and women's gender roles in Olukonda constituency and their linkages with adaptation to droughts is therefore crucial for sustainable development in order to avoid gender based disadvantages. It was necessary in this study to examine if there has been a transformation in gender roles caused by the impacts of droughts and to look further into how women and men's coping and adaptive capacity vary. The findings thereof can contribute to closing the existing gap concerning the gender based dimensions of droughts.

Indeed, there is a gap in previous researches regarding the gender based dimensions of droughts. This is despite the fact that literature on droughts and development emphasises the importance of engaging gender in droughts issues. Thus, the study aimed to produce new insights in to the constituency, focusing on the gender aspects of droughts adaptation. However, in order to create gender awareness that seeks to improve gendered adaptation strategies towards droughts and reduce environmental disaster risks, it was necessary to look further into gender roles at the family/household level.

This thesis therefore investigated farmers' adaptation to the droughts that took place in 2013/ 2014, 2013/2014, 2014/2015 and 2015/ 2016 in the rural areas of Olukonda constituency. Major droughts affecting large portions of the country occurred far back in the 1930s and for an extended period in the 1960s up to the 1970/71 season, which was declared the most devastating drought experienced to date in the Oshikoto region (Sweet, 1998). The next disastrous droughts occurred from 1982-1984 when there was poor rainfall for three consecutive years; and another drought was also experienced in the 1992/93 (Sweet, 1998).

The present study was a qualitative research strategy which is based on one week's fieldwork in Olukonda constituency. This study about gendered adaptation to droughts is centered on a micro level study where I employed qualitative data to understand the linkage between gendered adaptation and droughts. One can measure gender and droughts quantitatively but the present study was not interested in statistical findings regarding the research objectives. In order to examine the changes in gender roles and their dynamics, the research observed the changes at the household level and gender differentiated access to resources, coping and adaptation strategies. Data were analysed from in-depth interviews with rural women and men from Olukonda constituency in Oshikoto region in Namibia at the household level. Key informants were also interviewed. Qualitative in-depth interviews were used as indicators of the differences between adaptation, coping strategies, gender roles and how droughts transform them. Men and women, individual interviews and key informants provided the main data. Former researches were also evaluated and compared with new findings.

Exploring how gender roles are changing due to impacts of droughts and to understand what this implies for men and women's adaptive strategies was the main objective. In order to satisfy this objective, the researcher had to determine the coping and adaptation strategies employed by men

and women in times of droughts in Olukonda constituency, as a way to assess how the modes of adaptation relate to issues of gender dynamics in families/households. Furthermore, the researcher had to investigate the views of men and women on gender roles in matters of adaptation to droughts. Finally, the researcher had to explore how gender differences to adaptation can be transformed at the household level.

Thus, this research was undertaken to understand the farmers' gendered adaptation to droughts in the rural area of Olukonda constituency. The research was a case study of farmers from Olukonda constituency, and it focused on the adaptation to droughts by men and women at family/households level. The study provides insights and analysis of different gendered adaptation strategies.

The conceptual framework provides an overview of the important concepts in this qualitative research. It presents the key terms that were discussed further in the results section and literature review. The study used the Gender and Climate Change Analytical Framework as well as the Harvard Analytical Framework as guides in order to understand the key concepts related to gender and droughts. In the analysis of droughts, the gender approach is necessary to understand not only how the identities of women and men determine different adaptation and capacities to cope with droughts impacts, but also how to tackle both the causes and consequences of droughts. The conceptual frameworks such as the Gender and Climate Change Analytical Framework as well as the Harvard Analytical Framework are the foundation for the research's main objective and the results.

Since this study focused on answering different questions about men and women's modes of adaptation to droughts, the Sustainable Livelihoods Approach (SLA), including both the

Sustainable Livelihoods Framework (SLF) and gender theory, were used. The SLF is a tool that is used to improve our understanding of livelihoods, particularly the livelihoods of the poor and women who are among the most vulnerable to the effects of droughts, in particular to droughts for this study, and when used with participatory research methodologies, thus it becomes useful to analyse complex rural and urban realities (Oxfam, 2005). SLA framework was developed by the Department for International Development (DFID) of the United Kingdom, NDP, and NGOs, for example, CARE, Oxfam, etc.), and it is considered an important tool to improve the understanding of livelihoods, especially livelihoods of the poor and women who make up a large proportion of the poor.

While the Harvard analytical frame was developed by the Harvard Institute for International development in cooperation with the WID (Women in Development) office of USAID, and it is thus based on the WID efficiency approach in the development of communities. It is ideal to be used in projects specific to agricultural and rural based areas, and for adopting sustainable livelihood approaches to poverty reduction (Royal Tropical Institute, 1996). The Harvard analytical framework is a gender specific tool in identifying and analysing the activities of men and women. March, Smyth and Mukhopadhyay (1999) outline the Harvard Analytical Framework as an instrument that is used to measure women's and men's activities in a community, by measuring who does what activities and how much time they spend on those activities. It looks at how the division of labour is based on sex and not on the ability to perform a task. It is used at the micro-level or family level and it identifies their productive and reproductive activities.

Furthermore, the present researcher used the Gender and Climate Change Analytical Framework and the Harvard Analytical Framework to be able to direct the proper purpose of the research

questions and interview questions in accordance with the thesis main objective. The gender analytical framework is used to analyse what and how gender relations would be shaped or changed in the process of adaptation.

1.1.2 Background

The existing literature about Olukonda constituency in Namibia focuses mainly on the history of the constituency, example the traditional leadership of the constituency and the political aspects of the constituency. There is not really any academic reflection or body of literature pertaining to gender aspects of the constituency. This study thus aimed to produce new insights into the constituency, focusing on the gendered adaptation to droughts. In order to understand why this community is understudied we need to look at the history of droughts, gender roles and the gendered adaptation strategies used by men and women in times of droughts.

Evaluating rural men and women's gender roles in Olukonda constituency and addressing the impacts of droughts are therefore crucial for sustainable development in order to avoid gender based disadvantages. It was most necessary to examine if there has been a transformation in gender roles caused by the impacts of droughts and to look further into how women and men's coping and adaptive capacity varies. This can contribute to closing the existing gap concerning gender based dimensions of droughts.

According to the Namibia Livelihood Baseline study (2010), all the drought affected locations in Olukonda are within an estimated 50km radius of Ondangwa town. This has a significant influence on the assessment of findings, as many people (particularly the better-off) are not dependent on crops for either their food or their income. Rather, they are employed or have

business interests that provide regular income. All communities are predominantly Oshiwambo speaking Namibians.

The targeted communities for this research in Olukonda constituency are the majority of subsistence farmers (of whom the majority are women) and youth who depend to a high degree on agriculture (rain fed dry land crops), natural resources and livestock rearing both for subsistence as well as cash income in these semi-arid areas.

There is one main rainy season in the zone, from November to March. This is the season when farmers produce their millet crop. The long dry season is from April to October (seven months). The main sources of protein are beans grown by households and from milk from the cattle between the period January to June, when animals have adequate water and pastures to graze (Maskrey and Pelling, 2004).

Although there is no regular "hunger gap" in this livelihood zone, the most difficult or "lean months" are usually considered to be within the September-December period. This is because households would have exhausted their cereal production normally harvested in April/May and households start eating green crops early in the year. Most activities in the zone are regular throughout the year, for example sales of livestock and purchase of staple foods. Poor households utilize a number of "wild foods" such as palm fruit, marula, and oontanga (Kalahari melon) to produce products for sale (local brew, oil and juice) (Maskrey and Pelling, 2004).

In this constituency, although crop production is a major activity, the better off are employed (majority men) or have businesses and therefore they are not dependent on their crops for either food or income. The poor (majority women) also do not depend on their crops for income but grow a number of crops for their own consumption. In normal times, poor households have a

relatively low expenditure on food as they need to purchase cooking oil, sugar and salt and other items that they cannot produce themselves. According to the Namibia Red Cross Society (2013) households usually produce all their main staple foods: millet, beans, spinach, milk and meat. The better off households cope and adapt to droughts by selling more livestock than usual (although this is the usual time for livestock sales) in order to have additional cash for buying fodder. In some villages within the constituency the better off, look after the livestock of the poor households in addition to their own. The poor households cope with the droughts by relying more on income from their small business activities (sale of fruits) so that they can purchase more food from the market. This is because they have lost their main source of food, which is usually their own production. Most of the other activities in the constituency are regular throughout the year, e.g. purchase of staple food and small-scale trade such as "cuca" shops (Sophia Dunn, 2013).

As stated in the beginning of this chapter, there is not much literature that speaks about gendered adaptation to droughts or to any effects concerning climatic events.

1.2. Statement of the problem

The central problem for the research was to find out how farmers in Olukonda constituency adapt to droughts and how the modes of adaptation are related to gender dynamics. The problem guiding this research arose from reports that women perform multiple family, community and productive roles which can also make them vulnerable if there is no equity between men and women with respect to responsibilities that they perform in adapting to droughts (Carvajal-scorbar et al. 2008). In this sense, it is reported that poor rural women are unlikely to possess

resources to cope with droughts and so they suffer a worsening of their everyday conditions (MacGregor, 2010).

1.3 .Objectives of the study

The study was guided by the following objectives:

- To determine the coping and adaptation strategies employed by men and women in time of droughts in Olukonda constituency
- To assess how the modes of adaptation relate to issues of gender dynamics in families/households
- To investigate the views of men and women on gender roles in matters of adaptation to droughts
- To explore how gender differences to adaptation could be transformed.

1.4. Significance of the study

The study identified gaps within gender equality intervention programme and it also generated recommendations that may be useful to social service providers interested in addressing gender issues in adapting to droughts. Discussions and observations from this thesis may add to debates amongst policy and decision makers about the need for paying attention to gendered adaptation to droughts.

1.5. Limitations to the study

The study could have covered two focus group meetings, but due to financial constraints as well as limited time, the study only selected one group which served as the focus group and key informants. However, combining the focus group and the key informants interviews made it easy

for the researcher to obtain detailed information about the personal and group feelings, perceptions and opinions about the gendered adaptation to droughts in Olukonda constituency. The limitation to combining the focus group and the key informant was that some members of the group were hesitant to express their thoughts, especially when their thoughts opposed the views of another participant. It was difficult to secure appointments with focus group members because the targeted farmers were busy with ploughing their *mahangu* fields at the time of data collection. Consideration was made to interview only one group. The limitations were overcome by securing appointments well in advance and by clarifying the purpose of the study and informed consent was granted by all interviewees. The study was limited to Olukonda constituency only and as such, results may not be applicable to other constituencies in Namibia.

1.6. Delimitations of the study

The study focused on Olukonda constituency only and it paid attention to farmers' gendered adaptation strategies from the year 2013 to 2016 and gender roles at the household level during the same period. Olukonda constituency was selected because it had experienced the effects of the 2013 to 2016 droughts. The constituency is densely populated and it practices a mixture of crops and animal production for subsistence agriculture, and there is evidence of land degradation. Olukonda is semi urban and semi-rural as well and the constituency is close to Ondangwa town and this made it possible for the researcher to have responses based on both rural and urban experiences of droughts.

1.8. Outline of the thesis

An outline of the chapters is presented in an effort to give the reader a synopsis view of the thesis as a whole. Chapter one is a brief introduction of what the study comprises. Chapter one also focuses on the orientation of the study, statement of the problem, the objectives of the study, the key debates of the literature review, the significance of the study, the final aim of the study, and finally an outline of the different chapters.

Chapter Two covers the literature review. It reviews some of the literature surrounding gender adaption to droughts. In Chapter Three the research methodology is outlined with regards to how the study was conducted and the procedures followed by the researcher. Chapter Four is the presentation of findings generated during field work. Chapter Five is the discussion of the findings and it compares the findings with the reviewed literature Chapter Six outlines some conclusions and makes some recommendations based on the study and it is followed by a list of references and annexes. In order to gain a clear understanding of the gendered adaptation to droughts, an in-depth qualitative study was needed and therefore this study is a phenomenological study. As this is a new field of inquiry into Olukonda constituency, it employed an explorative method of inquiry to shed light on gendered adaptation to droughts. The methods of data collection were semi-structured in-depth interviews.

However, the experiences of farm women in Namibia provide an important window into the gendered dimensions of droughts. Because they depend on the land for their livelihoods, farmers are directly and dramatically affected by droughts and

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter is a review of the existing literature which is related to the theoretical framework of the study and gendered adaptation to droughts. It also presents a comparative analysis of other countries with almost the same situation as that of Namibia, in particular Olukonda constituency.

2.2 Defining the concepts

2.2.1 Gender

Gender refers to the relations between men and women, the significant differences that exist in most societies between the rights and opportunities of men and women, including rights to land, resources, work opportunities and wages, and participation in decision making processes (Dankelman, 2008). Gender plays a crucial role in seeking to understand the sustainable adaptation strategies to droughts because of the existing differential impacts to both men and women. The impacts of droughts affect women disproportionately by increasing the burden in food production and securing of household food security (Dankelman, 2008). Ensuring that men and women have equal rights and opportunities, is something that most countries have signed up to, through a number of international and national agreements and accords (Dankelman, 2008).

Few academic studies have been conducted especially on gender and droughts in Namibia. However, the experiences of farm women in Namibia provide an important window into gendered adaptation to droughts (Dankelman, 2008). Because they depend on the land for their

livelihoods, farmers are directly and dramatically affected by droughts. Many family farms in Namibia are structured by a gendered division of labour, in which men are more likely to be positioned as the "main farmers" while farm women's work is construed as "helping" (Fletcher, 2013; Faye, 2006). In addition to farm work, women are primarily responsible for childcare and other caregiving work (Jafe & Blakley, 2000), household tasks such as cooking and cleaning, and yard work (Fletcher, 2013; Kubik & Moore, 2005). Through their association with social reproduction tasks and their relative detachment from day-to-day farm decisions (Fletcher, 2013; Reinsch, 2009) farm women may experience drought disasters differently than men.

2.2.2. Gender roles

Gender role, also known as a sex role, is a social role encompassing a range of behaviors and attitudes that are generally considered acceptable, appropriate, or desirable for people based on their actual or perceived sex or sexuality (Levensque, 2011). Levensque (2011) continue saying that, gender roles are usually centered on conceptions of femininity and masculinity, although there are exceptions and variations. The specifics regarding these gendered expectations may vary substantially among cultures, while other characteristics may be common throughout a range of cultures (Levensque, 2011).

In Namibia gender roles, is defined as duties and responsibilities attributed to members of the two sexes by virtue of the fact that they are male or female, are most prominent within the sphere of the family household (Ambunda, 2008). Iipinge (2000), states that, duties are divided between husband and wife and siblings based on stereotypes of what men should do and how women should behave and not necessarily on ability or capacity. Decision-making powers are usually vested in the man. Women are regarded as dependants and, therefore, are supposed to follow

decisions and directions by the man. This applies equally to situations in consultations between husband and wife, where the man has the power to overrule his wife (Ambunda 2008). This control is exercised even on assets or possessions belonging to the wife at marriage, such as livestock bought in as her dowry. Thus, as the head of the household, men carry the key to the safe. Even food resources fall under the man's supervision. In instances where there is droughts and food shortage, the man has to be served first and any leftovers are shared by the wife and children (Iipinge, 2000).

Bye (2005) argues that farm women actively reinforce gendered roles and ideologies during a drought, which have the effect of reproducing gendered inequalities and, therefore, gendered vulnerability. Men migrate for work while women spend more time collecting for example fuel and water (Dankelman, 2008). Men and women have different ways to access resources, including physical resources like land, social resources (like networks), and financial resources (like income-generating work and credit) (Dankelman, 2008). In times of change, they will have different options and 'safety nets' for coping based on their distinct roles. In addition, women and men have different sets of knowledge and skills, such as knowing which seeds to plant during a dry spell or knowing how to dig a well. Recognizing their contributions will result in a wider range of options for preparing for and coping with change; participation in decision making and politics, and access to government services. Decision making is not always set on equal basis for men and women and this may affect their participation and the representation of their ideas in short- and long-term decision making on droughts impacts (Deton, 2002).

2.2.3. Drought

Drought is often one of the most devastating weather phenomena, which can lead to poor and vulnerable women and men to face multiple and complex challenges. Unequal distribution of resources and power imbalances are some of the root cause of poverty and they impact on a person's capacity to adapt (Okali, 2013). Although definitions vary depending on the context, drought is a period of several months or even years of abnormal dryness due to below-average rainfall that causes a pronounced decrease in forage yield relative to what is expected in an average year (Arora-Jonsson, 2011). Associated with the below-normal forage production are crop failures, livestock losses and severe socio-economic disruptions to humans (Wilhite, 2000; Downing & Bakker, 2000; Whetherald & Manabe, 2002).

Drought is a regular occurrence in the Namibian environment. It is one of the factors contributing to inequality across gender, ethnic, cultural or religious groups. Therefore it can also determine the different ways in which droughts impact the individuals, households and communities. Differences in access to information, control over resources and ability to innovate in response to climate challenges determine a person, household or community's ability to adapt. Some droughts are limited to certain areas of the country, for example the south only. These "local" droughts are mainly due to deviations in the local weather patterns (Brandshaw, 2004). They can occur as frequently as every two years but they are of a relatively short duration (part of a rainy season). Accordingly, they have a comparatively small impact on Namibian national agriculture (Heyns, 2011, Cotzee, 20111, & Hoffman, 2011).

Droughts can require women and men to take on different roles and responsibilities; and adaptation interventions can do the same. Droughts of a regional nature affect large parts of the

southern African subcontinent and they are mainly due to changes in global weather patterns (FAO, 2000). Not only are regional droughts more severe than local droughts, usually with a devastating effect on the agricultural sector and the Namibian economy, but they also last longer (FAO, 2000). However, they are less frequent, occurring cyclically every two to seven years. The major cause of regional droughts is the "El Niño" weather pattern that develops sporadically over the western Pacific Ocean (Agrawal, 2008). The importance of this phenomenon was realized only a few years ago. Whatever the nature of a drought, it follows a certain pattern to which drought management must adapt if the farmer wants to successfully negotiate the dry spell. The central issue is to plan for reducing the risks, or minimize the damage associated with a drought (Agrawal, 2008).

2.2.4. Adaptation

The Intergovernmental Panel on Climate Change Reports (IPCC, 2007) define adaptation as an adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Adaptation therefore involves adjustments in reducing the vulnerability of households to climatic variability and change (Adger, 2006).

On the other hand, Blaikie, (2000) define coping as the manner in which people act within existing resources and ranges of expectation in a given context to achieve various ends. Therefore, adaptation involves longer-term shifts in livelihood strategies, while coping involves temporary adjustment in response to change or to mitigate shocks and stresses on livelihoods (Eriksen et al., 2005; Migosi et al., 2012). However, adaptation mechanisms of people to

different hazards vary from household to household and region to region based on existing support systems that increase the resilience of affected individuals (Brooks, 2015).

Adaptation aims to reduce the vulnerability and improve the adaptive capacity, or resilience of people who rely on climate-dependent resources for their livelihoods. In the agricultural sector, adaptation requires the use of good agricultural, forestry and fisheries practices to meet changing and more difficult environmental conditions. Examples of adaptation practices in agriculture include: changing timing of planting or sowing; applying new technologies; and promoting agro-biodiversity.

Adaptation to variable climatic conditions has been an ongoing process; women and men are continually modifying their agricultural practices to naturally-varying climate conditions according to their specific needs, knowledge and access to resources (Adams & Welch, 2008). Governments and agencies play a critical role in improving farmers' capacities to reduce risk or make optimal use of climate variability through disseminating agro-meteorological data and tools; conducting vulnerability assessments; and providing policy advice to strengthen institutional approaches to disaster risk reduction (Adams & Welch, 2008).

Adaptation at an accelerated and more targeted pace will be critical for the security and the development of vulnerable populations, like the estimated 1.4 billion rural people who are dependent on small-scale resource poor farming in developing countries (Adams & Welch, 2008).

While adaptation research and activities targeting vulnerable populations are increasing in number, limited attention has been given to the dynamics between men and women within at risk

populations (Meena, 1992). Experience shows that interventions to strengthen livelihoods and food security from external shocks are more efficient and effective when gender differences are properly understood and addressed, and yet research and policy-making have so far failed to examine extensively the gender aspects of vulnerability and adaptation to drought (Meena, 1992).

2.3 Gender dynamics in droughts impacts and adaptation

The global perspective on gendered adaptation and impacts to droughts is believed to be unequal, with women carrying the burden of gender roles in the home and at the community level. The literature review that follows explores the understanding of gender dynamics in relation to droughts impacts and adaptation. It is believed that it is better to study the gendered impacts to better understand the gendered adaptation to droughts.

The literature will also explore women and men's gender roles, access and control over resources, and how influence over decision-making can play a strong role in determining the adaptation strategies to be employed in times of droughts.

Aguilaret al. (2008), for example argue that drought and its impacts threaten to significantly undermine efforts towards achieving all the MDGs (Millennium Developmental Goals), particularly those related to eliminating poverty and hunger and promoting environmental sustainability.

Intergovernmental Panel on Climate Change (2007) predicted that drought impacts will be differently distributed among different regions, generations, age classes, income groups, occupation and gender, and also that the poor primarily but by no means exclusively in

developing countries will be disproportionately affected. Gender inequalities are directly linked with poverty (Aguilar et al., 2007).

Similarly, the vulnerability of poor men and women to droughts and its variability will aggravate inequalities in health and access to food, clean water and other resources (Aguilar et al., 2007). The diverse impacts of droughts as they relate to gender will be felt on: energy production and demand; water; agriculture; forestry; disasters / extreme weather events; health; natural resource use and management; and migration. These are explained below as follows:

Energy production and demand: A lot is known about energy from a women's perspective in developing countries: the lack of access to energy; the need for affordable energy supporting women's income generating activities; the high number of victims of indoor air pollution and the need to replace inefficient biomass stoves; the physical burden of collecting firewood and the impacts on women's time and so on (Aguilar et al., 2007).

Gender aspects in the energy sphere have been insufficiently studied in industrialized countries, compared to developing countries (Aguilar et al., 2008). Greater attention to the energy needs, concerns and ideas of women in developing countries can improve the effectiveness of energy policies and projects, and also promote overall development goals such as poverty alleviation, increased employment, and improved health and education levels.

Furthermore, women and men's energy consumption differ in the amount and the purposes of energy use, as well as in their attitudes towards energy saving measures and adaptation mechanisms (Aguilar et al., 2007). These disparities need to be taken into account when developing energy adaptation strategies at all levels.

Water: Droughts are already exacerbating existing shortages of water. Women, largely responsible for water collection in their communities, are more sensitive to the changes in seasons and climatic conditions that affect water quantity and accessibility that makes its collection even more time-consuming (Canadian International Development Agency (CIDA), 2009). The World Health Organization (WHO) estimates that the energy used to carry water may consume one-third of a woman's daily calorie intake (Aguilar et al., 2007). In areas where water is in particularly short supply, calorie use may be even greater, compounding the risk of malnutrition in resource-poor settings (Aguilar et al., 2007). As more work is required of women to supply water from more distant sources, in many parts of the world, girls will miss schools in order to help meet family water needs.

Agriculture: Drought is reducing crop yields and food production particularly in developing countries, thus affecting women's livelihood strategies and food security, and therefore their right to food (Aguilar et al., 2007). Some researchers note that droughts can result in a ten-fold increase in the number of hungry and malnourished people; consequently, women are likely to experience a decrease in nutritional health, as they are often the first to go hungry in an attempt to protect their families (Aguilar et al., 2007).

Forestry: Men and women often have different roles with regards to forest resource management in planting, protecting or caring for seedlings and small trees, as well as in planting and maintaining homestead woodlots and plantations on public lands. Men are more likely to be involved in extracting timber. Women typically gather non-timber forest products (NTFPs) for commercial purposes and to improve living conditions within their households, e.g. medicines,

fodder for livestock, etc. Due to droughts, these roles and the respective workload burdens and/or income generation capabilities create uncertainty in communities (Aguilar et al., 2007).

Disasters/extreme weather events: Gender roles often place women and men in locations that influence their vulnerability to hazards of droughts (Earson, 2004 as cited in Aguilar et al., 2007). Women's traditional roles (looking after children and the elderly) and cultural restrictions may hamper their self-rescue efforts in almost any type of disaster. In addition, due to capacities that differ between men and women, gender-based life skills and experiences, women and men may use completely different resources in the same environmental context, or they may use the same resources in different ways (Hannan, 2011).

Health: Gender is an important social determinant of health. The gender division of labour within the household, and labour market segregation by sex into predominantly male and female jobs, expose men and women to varying health risks. For example, in rural Bangladesh, as well as in Nigeria, the responsibility for cooking exposes women and girls to smoke inhalation from cooking fuels (especially fuel wood) etc. Patriarchal norms denying women the right to make decisions regarding their sexuality and reproduction exposes them to avoidable risks of morbidity and mortality, which can be exacerbated in a climate change and variability regime (Martens, Kovats, Nijhof, de Vries, et al, 1999).

Natural resource use and management: Women and men have different socially or culturally defined roles (Hannan, 2002; Briceño, 2005). In many developing countries women remain predominantly responsible for food production, water and firewood collection. Due to droughts, issues of availability, access and quality of these resources are greatly affected, causing significant shifts in the tasks and dependence on local natural resources, often resulting in an

increase in women's domestic burdens (collection of water, fuel and fodder). Women's initiative and resourcefulness in finding sustainable alternatives will be the key to adaptation in coping with the scarcity of traditional resources (Aguilar, 2007).

2.4 Droughts, gender and adaptation strategies in Africa

FAO (1997), notes that communities that have lived under drought situations for many generations develop coping strategies to lessen the impact of droughts. Recently, people in southern Africa have developed effective responses to alleviate the ravages of droughts on their communities. These indigenous responses go a long way in alleviating food shortages caused by droughts. When household strategies are adapted to ecological, economic and social conditions, they enhance the quality of life for household members and also foster more sustainable use of natural resources. According to FAO (1997), in Kirgizstan, household gendered adaptation strategies are developed according to existing potentials and promising opportunities. These strategies are oriented towards limiting the risk of total dependency on water and seek to make use of positive synergies between various activities in order to create substantial added values. Such household strategies used in coping with droughts include:

2.4.1 Gendered coping strategies

Communities that have lived under drought situations for many generations develop adaptation strategies to lessen the impact of droughts. These strategies usually follow a sequence such as the reduction in the number of meals, followed by migration and the sale of assets such as livestock.

According to the Swiss agency for Development and Cooperation (SDC) (2010), in most African households all over the world, household strategies are developed according to existing

potentials and promising opportunities. These strategies are oriented towards limiting the risk of total dependency on water and they seek to make use of positive synergies between various activities in order to create substantial added values. Such household strategies used in coping with droughts include: household strategies for managing water dependence for households to ensure their access to water, of which the social network is a key strategy. Large families with influential social networks stand a better chance in negotiating and promoting their interests. The main principle of this strategy which is understood by participating families is that one good turn deserves another, that is, if a family solicits help, they must be able to return it whenever the need arises. A household that does not respect this principle is excluded from such a network; the only disadvantage of this strategy is that poor households are being marginalised. In order to source for the much needed water, households adhere to formal and informal groups that take care of construction and maintenance work on the distribution system.

The diversification of agro-pastoral production is another strategic aspect on the household level which helps to minimise the potential risks that are linked to hazards of climate or economic and social crises. Based on their resources, African households invest simultaneously in rain fed and irrigated agriculture. Horticulture and tree growing are two further areas of investment. Others include livestock, which comprises of poultry, small ruminants and for the wealthier households, cattle and horses. The creation of additional sources of income is an increasingly important strategy (SDC, 2010). Various ways are being employed by African farmers to produce or supply needed water to plants; for example, perforated bottles or cans filled with water are buried between two plants to supply the roots with water in an economical and targeted manner. Another example is adding clay to soil where trees are planted so as to reduce the need for irrigation water. In 1989, several Burkinabe's livestock producers who were involved in a pilot

study organised by the Swiss Agency for Development and Cooperation (SDC) created a group called Association for the Promotion of Livestock in the Sahel and Savannah (APESS), with the aim of disseminating ideas and innovations to improve living conditions for Sahelian livestock producers (SDC, 2010). A study done by Yufang Su (2017), revealed that men and women from Yunnan Province choose different coping and adaptation strategies: for example, women were more likely to adapt to agricultural water shortages by using different farming techniques and they were more willing to consider shifting to other activities such as forestry and animal husbandry. Women and men also played different roles in community-scale water management: the results showed that women in Yunnan Province were active in informal ways in water management and conflict prevention. However, despite the increasingly active role of women in managing water during the drought, cultural attitudes still excluded them from decision-making (Yufang Su, 2017).

According to Bruschweiler and Gabathriler (2006), various activities were put in place to bring about increases in the quality of livestock production and farmers' livelihood. Such activities include: hay storage, livestock selection and livestock production systems, protection of vegetation cover, as well as education and training. Hay storage, livestock selection and livestock production systems in the ancestral method of livestock production in Burkina Faso were not used to increase the quality of livestock production in the past. Animals were fed with naturally grown grass as well as travelling long distances sometimes over the border of Burkina Faso into Angola whenever the need arose. With the help of APESS, herdsmen were encouraged and convinced to make hay reserves on managed grazing lands that would be sown with seed and fertilized with animal manure, harvested and stored in sheds; this was a practice that was never part of their ancestral tradition.

2.4.2 Agricultural response

Burton and Lim (2005) and Rosenzweig and Tubiello (2007), mention that adaptation in agriculture is the norm rather than the exception, and that farmers in Burkina Faso in the past demonstrated sufficient adaptive capacity to adapt to droughts on short, medium and long term time scales. Important, to note however, that the adaptive strategies of farmers are determined by: education or human capital; wealth; material resources; societal entitlements; information; technology; infrastructure and resources (Belliveau, 2006; Easterling et al., 2007; Adgar et al., 2009).

For years droughts have become one of the main challenges for livestock farmers in Africa (Le Houerou, 2002). Livestock farmers responded differently through time. With land available in abundance, farmers used avoidance strategies by adopting a nomadic system where they moved from drought-stricken areas to areas with good supplies of feed and fodder. Increased pressure on land forced farmers to respond in different ways. Coping with droughts is considered a short-term response to feed and fodder shortages (Vogel, 2005; O' Farrel, Anderson, Milton & Dean, et al., 2009).

A study conducted by CARE (2010) in Uganda shows that female-headed households and wives of male farmers are significantly less likely to adopt drought tolerant maize than male farmers, which researchers attribute in part to lack of access to resources as well as less knowledge about drought-tolerant crops among women. Evidence exists in research findings by Doss and Morris (2001) on gender differences in the adoption of different technologies between male and female headed households that expose vulnerabilities of women to droughts. Ownership and control over land was lower in female headed households in sub-Saharan African countries (Doss &

Morris, 2001; Blackden, 2006; Koru & Holden 2008), which implies restricted access to loans and social services and education opportunities. Due to male dominance and power; male headed households are more likely to adopt fertilizer use and to have better market access than females. This seems to suggest that unequal distribution of assets between men and women in rural households favour or constrain women adaptive capacities.

In Ethiopia, male-headed households are significantly more likely than female-headed households to adapt new crop varieties in response to weather changes, though the reasons as to why in this context are unclear (United Nations, 2009). Female headed households are relatively poorer and most of the female households are headed by widows. Male households on the other hand, tend to have access to better information that can be used to modify production practices than those by women. Similarly, female land ownership in Africa is generally low despite the fact that access to land provides an important source of resilience for women who may lack other options to adapt to the effects of droughts. Women heads of households also had smaller farms, less access to credit and inputs and lower levels of education, a factor that facilitates access to and proper use of technologies. A study by the Ministry of Finance, Planning and Economic Development (MFPED), (2002) found that female headed households in Soroti district in Kenya which had inadequate access to/control and ownership of land, realised poor crop yields, owned fewer animals and had limited access to social services, particularly due to cultural influences such as patrilineal inheritance, which is a key feature of vulnerability to droughts. On the contrary, Nhemachena and Hassan (2008), found that female headed households were more likely to take up drought adaptation methods in the Nile basin of Ethiopia. This seems to suggest that the influence of gender on drought adaptation varies among cultures and social structures.

Moreover, male farmers in Ethiopia and Cameroon are more likely than women to use fertilizer to adapt to rainfall variability as women often lack sufficient capital. In Tanzania, women reported that they were replanting certain crops that they are responsible for (such as groundnuts) more often because of changes in weather patterns that are destroying seeds (Schipper et al. 2008). In contrast Ravera and Martin (2016) point out that to guarantee food security in the face of droughts in India, both men and women prioritise the adoption of traditional crop varieties with specific nutritional properties especially millet and pseudo cereals. It is worth noting that other collective adaptive strategies were also prioritised and adopted, such as taking common decisions on land and management, and sharing planting materials and land among farmers in the case of crisis in India compared to other African countries such as Ethiopia (Ravera and Martin, 2016).

In a study carried out by the Global Gender and Climate Alliance (GGCA) (2015), in Nepal, NGOs often targeted information on adapting agricultural activities to droughts to men, reflecting established gender roles. In addition, gendered social norms in Nepal often inhibit women from contributing to community discussions on droughts adaptation, making it less likely that women's needs will be met in adaptation planning, and in turn, making women more vulnerable to the effects of droughts (Haynes, 2010). In Iran, pressures related to drought are increasing women's farm responsibilities, even in relatively well-off households (Handmer, 2016). In contrast, in the Philippines, the farm roles of female household heads are changing as farmers struggle to adapt to droughts. Women's farming experience and relatively greater education levels compared to men in this setting are enabling them to take on greater managerial responsibilities, challenging traditional gender roles (Carrington, 2013).

Parkinston (2013) points out that, farm women's experiences of droughts must be understood within the broader political and economic context of Prairie agriculture. According to Parkinston (2013), droughts vulnerability is not simply a product of climatic factors. Factors such as market prices, input costs, policies, and population trends can increase or decrease farmers' access to much-needed resources and this subsequently shapes their vulnerability and gendered adaptive capacity in the face of droughts (Parkinston, 2013). Furthermore Hulme (2010), discuss the diversified traditional crop varieties adopted by peasant farmers in western Sudan in an attempt to adapt with increasing persistent droughts. This is a means of spreading risks of total crop failure, because if one crop fails the other one will survive.

Ruttenberg (2005), in a study of farming systems in the tropics also noted that diversification of production such as growing a range of crops is a typical risk-spreading device used world over. The chief defence against food scarcity in Zimbabwe is the cultivator's skill whereby the staple crops such as millet (rukweza) and rapoko and bulrush millet (*mahunga*) are planted (Lliffe, 2000). These crops provide the best risk spread as they suit the low-rainfall areas. This observation is also a true reflection of what happens in Mberengwa district of Zimbabwe. Manzungu et al (2001) recommended short, medium and long season sorghum varieties which reduce the risk of complete crop failure. Dupriez (2008), also 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 matures and they react differently to droughts. According to Jerie and Matanga (2012), a variety of ethno-science based drought coping strategies are utilized in the southern part of Mberengwa district in Zimbabwe. These drought coping strategies include multiple cropping, early planting, planting drought tolerant crops, basin tillage, transhumance movement, supplementary feeding, destocking, deep welling, barter trade, selling/hiring labour

and begging. Barter trade was the most widely practiced. In coping with droughts using drought tolerant crops, households aim for survival of at least one crop which can see them through to the next harvest (Jerie & Matanga, 2012).

2.4.3 Income response

The way out for the poor in a drought prone area is the development of non-farm rural activities which help to boost the income and thus enable households to fend for themselves. In a study carried out by Angula (2010) in Namibia, it was revealed that women are the first to diversify their livelihoods. They do basketry, process marula nuts and oil or sell their chickens, pigs or goats to raise money in order to buy food. The study by Angula (2010) also revealed that earning a salary helps them cope better with poor crop yields. A man from this study reported that he regards employment as the main source of livelihood during droughts (Angula, 2010).

According to Angula (2010) most households in Epyeshona village, Namibia have a family member who is employed either in the area or elsewhere. The presence of an employed household member or receiving remittances from relatives improves household security. Opportunity to participate in economic activities is limited to informal business such as shebeens (home based liquor bars/stores), sale of natural products (mainly by women), wood carving (mostly by men, but it is no longer sustainable), basketry, traditional brew, brick-making and domestic work. A market exists, some three km from Epyeshona village where men and women can sell local products (Angula, 2010).

In another study conducted by Olaleye (2010) in Kenya it is reported that, during the droughts of 1994/95, farmers engaged themselves in various activities such as trading in small stores or

running a taxi as well as horticultural activities. The increased involvement of the areas affected by drought in the cash economy and improved transport links with major cities of Kenya has opened up possibilities for migration in search of employment (Olaley, 2010).

Other adaptation mechanisms adopted by farmers in Zimbabwe during drought periods include gardening and selling vegetables, working as casual labourers, selling livestock and livestock products such as milk, little use of credit was employed unlike in other countries of the world, except in rare cases, sale of personal effects (such as jewellery or watches), household effects (such as furniture) or items of agricultural equipment to raise cash during drought emergencies do not occur among farmers in Zimbabwe (Kinsey et al., 2000).

A study done by Ndlovu (2010) in Bulilima and Mangwe districts of Zimbabwe found that asset disposal has increased over the years with the selling of cattle and small livestock such as goats and chickens being the most popular coping strategy in the two districts. As well as providing income during a period of drought, selling cattle does have the benefit of reducing the herd size so that not all livestock will die due to food shortages. Therefore, some cattle may be sold to buy supplementary feed to save other cattle during drought years. Although the selling and consumption of small livestock, especially chickens and goats, was common to most of the households who had them, this coping mechanism did not significantly reduce vulnerability because of the little money they fetched on the market. The selling of assets, if relied upon too much, can in the long run increase drought risks as communities will not have enough productive assets to prepare for future droughts. Davies (2006) indicates that buying and selling cattle is generally recognized as a common strategy used by men to cope with income fluctuations due to

drought in many rural areas. However, a relatively large proportion of households in African regions often do not own any**.**

2.4.4 Migration

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

Migration can play an important role in building adaptive capacity to droughts in low-income countries, for example by diversifying household income sources and leading to positive development impacts. However, there is relatively little research on how droughts adaptation policies account for migration.

According to Sward (2012), in recent years, a number of reports have suggested that droughts will result in new waves of human migration, as people leave areas affected by flood and

droughts. For example, the Stern Review suggested that 150-200 million people could be displaced by droughts by 2050. However, the relationship between migration and droughts is complex, and the available evidence shows that people make pragmatic, disaster-specific choices about where best to move in the face of environmental changes (Sward, 2012).

Women (and children) who are refugees of disasters or conflicts caused by the scarcity of resources are exposed to increased risks compared to male refugees, be it in refugee camps, resettlement areas, or countries where displaced people may seek asylum. Women and girls in particular are vulnerable to exploitation, trafficking and other forms of sexual and gender-based violence. Migration may be one response of people whose livelihoods are affected by droughts. Droughts may not be the sole, or even the most important 'push' factor in migration decisions, but in combination with other social, economic and political factors, droughts can become a trigger (Aguilar, 2007).

Compared to men, women are affected differently, and often more severely by droughts. This is largely because men and women are bound by distinct socio-economic roles and responsibilities that give rise to differences in vulnerability and ability to cope with these droughts (Daze, 2009). This makes vulnerable groups especially poor women to be likely faced with problems such as food insecurity, loss of livelihood, and hardships due to environmental degradation. This in turn leads to displacement and a host of other potentially devastating economic and social consequences. It is poor women who are mostly vulnerable and who will bear the adaptation burden despite their comparatively insignificant contribution to the cause of droughts. In addition to these vulnerabilities, women are always underrepresented in decision-making with respect to plans and actions to mitigate, and adapt to droughts.

In Ethiopia, more severe droughts tend to increase migration by men, but reduce migration for women, particularly for the purpose of marriage. This may be due to the unwillingness of families to absorb the high costs of marriage (dowry) during droughts (Bradshaw, 2004). Drought, disease, and flood shocks in Nigeria reduce migration by women, likely due to shortages of off-farm employment opportunities and the lower cost of bride prices, making it less desirable for households to send females elsewhere (Hanigan, 2012). In Burkina Faso, rainfall variability is significantly associated with migration, particularly for men, who are likely to move from areas with poor rainfall to other rural areas that are wetter (Bryant, 2014).

According to Bryant (2014), in Bangladesh, crop failure and flooding disproportionately increase the rate of migration by women. In Pakistan, extreme heat increases the likelihood of migrating for both men and women, but women are less likely than men to move long distances. In Nepal, men's likelihood of migrating is affected by firewood availability (which men tend to collect), and women's likelihood of migrating is affected by the availability of fodder (which women tend to collect), suggesting that the impacts of climate shocks on specific gendered livelihood activities influence the propensity to migrate (Bryant, 2014).

In Namibia, men migrate to nearby towns, villages and regions etc. to look for employment. Some men migrate to other communal areas within the country or to other regions within the country in search of better grazing opportunities (Angula, 2010).

According to Bruschweiler and Gabathriler (2006), arid and semi-arid regions face increasing difficulties, which include recurring drought, over-grazing, resource greedy agricultural production and population growth which causes disruptions and severe degradation, leading to impoverishment, hunger and distress. During the dry season or drought periods, pastoralists

travel long distances to ensure sufficient grazing opportunity for the herds, which are often very large. Their presence among the sedentary population, which has its own livestock, is often perceived as undesirable, leading to conflicts over grazing and water points (Bruschweiler & Gabathriler, 2006).

In a study conducted in Burkina Faso, female participants stated that the empowerment discourse of some adaptation projects enhanced their capacity to negotiate and obtain new roles within the household (Nielsen & Reenberg, 2010). Djoudi and Brockhaus (2011), found that women from socially disadvantaged groups were able to engage in new activities after the social structure of their community was affected by the impacts of drought and most adult men had migrated. They were less vulnerable than women from the higher social class, who were restricted in their mobility and in the strategies they could adopt to cope with environmental change. Ford and Goldhar (2012) describe similar patterns of women moving into salaried positions. Those women emphasized increasing freedom of choice in recent years, which they associated with environmental changes. The same pattern was identified by Nielsen et al. (2012), who emphasize the importance of changes in livelihood activities, and the connection between wage labour and greater economic freedom for women. Nielsen et al. (2012) argue that, such shifts have contributed to a change in gender roles for women and young people, which was apparent in the greater role played by women in household decision making.

2.4.5 Institutional support and social networks

According to Kinsey et al. (1998), the effects of drought of 1991-1992 on food consumption has two components; the first being that consumption was below what it used to be. Secondly, food consumption was maintained partly through the government's drought relief programmes.

A study conducted by Olaleye (2010) in South Africa in the district of the Free State Province shows that individual farming households were unable to cope with droughts without the help of the national government. The main form of relief provided by the state was household income support operated by the Department of Social Welfare (DSW); this was in two categories; free food distributions for the elderly and the disabled as well as distributions on the basis of participation in food for work programmes for destitute families with able-bodied members. The food for work programme also targeted children under the age of five. In addition, income support was also provided to needy households in the form of assistance with school and examination fees, whilst seeds and fertilizer packs were also distributed before the subsequent season (Olaleye, 2010).

In Namibia, Angula (2010) in a study in Oshana region indicated that both women and men reported that the government provides drought relief, and during her discussions with the community, it became clear that local people rely too much on government relief and they are not attempting other means or mechanisms to enhance their adaptive capacities. Moreover, the study by (Angula, 2010) found that there are no credit facilities for community members to engage in other livelihood or income generating activities. Developmental needs are discussed at Constituency Developmental Committee level. The Regional councillors are responsible for the distribution of the drought relief food.

In a study conducted by Mutasa (2011), in Zimbabwe, respondents in Buhera and in Chikomba admitted to having received relief aid from NGOs while only one respondent in each research site indicated that they had received food aid from the government. However, other respondents

claimed that the government was too broke to be of assistance, further cementing the notion that the state was failing its citizenry.

In times of adversity people also rely on social support networks. These include rights and obligations between members of the same household and with other wider groups with a shared identity such as a clan or tribe (Dercon, 2002). A study conducted by Ndlovu, (2010) in Zimbabwe revealed that parents may influence strategic marriage partners for their daughters or sons into a comparatively wealthy family so as to call on resources in difficult times. There are also wider obligations from the whole community to assist those facing acute hunger and some public assistance and food aid from a number of non-governmental organisations have been very helpful in Buhera and Chikomba districts. At the same time, sources of household income other than the dominant one may be employed, such as casual labour, petty trading, cross border trading and artisanal work (Ndlovu, 2010).

In parts of rural Mexico, social networks, particularly among women, rely on the reciprocal exchange of fruit and vegetable products (Lageretabua, 2013). As climate variability and water scarcity adversely impact crop yields, the safety nets that women have developed with one another to assist in times of scarcity are fraying, weakening the ability of women to share tasks or engage in community development. By affecting the production of food that is used as gifts, these shocks disrupt transboundary ties that women have with family and friends in the United States (Lageretabua, 2013). Case study evidence from Nicaragua notes that men are more likely to be involved in community organisations and they have stronger social ties than women, which they rely upon following drought events (Lageretabua, 2013). .

According to Mutasa (2011), in Zimbabwe, most of the non-food requirements were obtained from close networks of family and friends. Others who had resources to travel outside the country would import maize flour for their relatives as it was not easily accessible in Zimbabwe due to the ongoing economic and political crisis. Respondents also recalled how the *kupemha* (adversity induced begging) and kusunza (grain purchases and/or trade) were prominent and encouraged during the previous droughts (Mutasa, 2011).

Meanwhile, Angula (2010) points out that social networks and relations amongst communities are declining. People are not as compassionate as they used to be and the culture of sharing of food resources at the community level is diminishing. At household level, alcohol abuse is affecting women as some men are not taking responsibility of their households and therefore they spend most of their income and pensions on alcohol.

2.5 Gendered adaptation strategies in Namibia

Men and women have been coping and adapting to the effects of droughts and other climate related variability for years. In order to ensure good productivity, crop fields require manure. Concerns were raised by community members in Namibia that the declining numbers of livestock compromise this farming method especially as there are no other sources of fertiliser available (Angula, 2010).

Indigenous knowledge of local land units also helps to decide what to plant and where during floods or dry years. The poor households do not own sufficient livestock to produce manure and usually they are settled on poor arable land. In a study conducted by Angula (2010) in Oshana region, it emerged that women are mainly responsible for preparing the fields. Therefore women

are expected to cope and develop adaptation strategies to deal with reduction in land productivity. Furthermore, it was also reported in the same study by Angula (2010) that women and young couples are forced to settle on marginal and fragile land that are prone to dry environmental conditions (droughts).

Therefore, the way to cope with lack of grazing is to migrate to other areas for seasonal grazing. Of which this is mainly practiced by male farmers, and another way of improving livestock survival was to collect pods (from acacia trees) for feeding.

Men and women in Ohangwena region confirmed in a study done by Hasheela (2010) that they do not grow crops for selling purposes as they entirely depend on them for subsistence, hence they see crop loss during droughts as food loss and not as loss of income. To ensure survival during extreme droughts, they store their crop products in grain storage baskets. In addition to dependence on crops for subsistence, farmers supplement their diets with natural resources, mainly during the rainfall season. Although farmers can get a little bit of harvest during the droughts, farmers in Ohangwena region have indicated that they do not get compensated for any loss. Nevertheless, they get some drought relief from the government. Farmers in Ohangwena region have however, indicated that the drought relief needs to be increased, and that they need to educated on how to deal with, and adapt to droughts (Hasheela, 2010).

2.6 Coping strategies with droughts in Namibia

Sweet (2008) states that prior to the drought of 1992/93; there was no institutional capacity to deal with serious drought or other environmental disasters in Namibia. Coupled with various efforts made by communal and commercial farmers to cope with the effect of droughts as much as they could, the national drought task force was constituted by the government. Activities by communal and commercial farmers as well as government efforts in mitigating the effects of drought are as follows:

2.6.1 Coping strategies by communal households

During the period of droughts when crop production or the household income declines, rural households draw on a number of alternative sources for cash and food, such as livestock sales, assets sales, informal transfer and borrowing. Three related coping strategies practiced are reduction in non-food expenditures, rationing of available foods for both human and livestock consumption, and demographic adjustments (Benhin, 2008). When livestock is threatened by droughts, the main option is to sell some animals, buy animal feed and/or move some animals. Not many communal families sell domestic assets because they get free food from the government, but there is an outflow of household adults in search of food. Other methods employed by communal households in coping with drought include seasonal movements of animals which was evident in the Northern region where there was significant movement into Angola where less concentration on animals exists, and the use of fodder provided by the government (CARE, 2009). Communal households were generally reluctant to sell animals during the drought for a number of reasons which are: they are not commercially oriented and they have different reasons for keeping livestock, the majority of their herd and flock size are

small, by the time drought it apparent, the animals have already lost healthy condition and their sale value thus is reduced. Lastly, the sale points tend to be few and far between, at least in Northern region communal areas, and stock further lose their health condition by the time they reach the sale point (CARE, 2009).

The commercial farmers were able to cope and manage the effect of droughts better than the communal farmers, and the measures taken include: compensation scheme from the government, availability of larger resources of capital to draw upon, better access to market and supplies for buying in and selling out. However, the main concern was to avert loss of livestock and wildlife unlike communal farmers who were worried about household daily needs and it was easier to obtain credits to fund mitigating drought activities because they have collateral (Angula 2010).

2.6.2 Coping strategies facilitated by the national government

The national government put in place various measures to mitigate droughts, these measures include: preparation of an emergency drought budget in 1992, appeal for donor support, and increase in the allocation for water, food distribution to vulnerable groups i.e. children less than 5 years of age and pregnant/lactating women, the elderly and physically challenged people (Selvarajan, 2002). This was done to prevent drought relief dependency syndrome because almost half of the Namibian population was at risk. In trying to execute the above listed measures by the Namibian government, failure was encountered and this was due to the non-availability of guidelines to classify a village or community as drought affected, hence all rural communities were included if they were in a region designated as drought affected. Another reason for the failure was that aid was targeted at individuals but it was distributed to households due to lack of guidelines to screen out wealthier households (Patrick, 2003).

Other measures by the government include food for work. This is a situation whereby food aid is received by able-bodied adults in affected areas through a food-for-work scheme devised and run by local communities. This also failed due to a lack of adequate coordination during droughts as the intervals between submitting projects for approval and the arrival of food were too long, as such discouraging potential participants (Bruschweiler & Gabathler, 2006).

The government also provided fodder and lick subsidies for livestock farmers, and grazing lands were purchased from small freeholders to serve as alternative grazing sites for livestock farmers, and subsidies for the transportation of animals to such areas were also provided (Sweet, 1998). There was also the provision of emergency water supplies; the main components of the water assistance offered under the drought relief programme are in four categories which are the rehabilitation of disused or faulty boreholes, provision of new boreholes, extension of pipelines and branch lines, as well as the provision of water tanker services with priority given to schools, clinics and disadvantage rural communities (Downing, 1991).

Sweet (2008) concludes that failure was experienced in the drought relief programme practiced during these periods, and as a result, he recommended that there is a need for a better targeting for all drought relief subsidies, a structure for food-for-work should be put in place before any drought period, and above all, an effective early warning system is invaluable for timely implementation of drought mitigation and relief resources, but this must be accompanied by an infrastructure for effective implementation.

2.7 Gendering droughts adaptation in Namibia

Social factors can significantly shape how humans are affected by droughts (Adger, 2003) and how they respond to droughts. Kelly and Adger (2000), for example noted the importance of examining the gendered adaptation to droughts. Examining gendered adaptation to droughts is important because women and men tend to have systematically different experiences in relation to droughts, based on the inequalities associated with socially constructed gender roles. Gender serves as an important dimension of adaptation, that is, whether and how women and men are affected by and respond to droughts (Seller, 2016).

Droughts adaptation studies focus on direct physical, chemical or biological effects, yet a full assessment of the consequences for human well-being clearly requires an evaluation of the manner in which society is likely to respond through the deployment of coping strategies and measures which promote recovery and, in the longer-term, adaptation.

The Intergovernmental Panel on Climate Change (IPCC) (2010) has stated that social inequality based on gender, race, age, socio-economic status, and ability can determine a person or system's vulnerability to climate extremes (Field et al., 2012). Disasters can exacerbate existing inequalities in society (Enarson et al., 2007), resulting in different levels of vulnerability and unequal access to resources before, during, and after the climate event such as droughts. Women have historically played integral roles in food preparation, childcare, and healthcare roles that are critical during droughts but that becomes more difficult to carry out during such events (Enarson & Chakrabarti, 2009). Entrenched gender roles can therefore create different experiences of disaster for women than for men (Dankelman, 2010; Enarson & Chakrabarti, 2009).

At the same time, some feminist scholars have observed a tendency in the gender and droughts literature to portray "women" and "men" as homogeneous categories while ignoring differences caused by race, socio-economic class, geography, ability, and education (Enarson et al., 2007). Moosa and Tuana (2014), document the growing importance of intersectional and contextual studies that examine how gender interacts with other forms of social difference, such as socio-economic class or rurality, to create different experiences of climate extremes even within the social categories of "women" and "men." Arora-Jonsson (2011), disputed sweeping and universal statements about the vulnerability of women, calling instead for more contextualized analyses of gender and droughts that address local gender roles and ideologies in specific locations including situations where hegemonic masculinity may render men vulnerable to droughts.

Few academic studies have been conducted specifically on gender and droughts in Namibia, other climate extremes. Many family farmers in Namibia are structured by a gendered division of labour, in which men are more likely to be positioned as the "main farmer," while farm women's work is construed as "helping" (Fletcher, 2013; Faye, 2006). In addition to farm work, women are primarily responsible for childcare and other caregiving work (Jafe & Blakley, 1999), household tasks such as cooking and cleaning, and yard work (Fletcher, 2013; Kubik & Moore, 2005). Through their association with social reproduction tasks and their relative detachment from day-to-day farm decisions (Fletcher, 2013; Reinsch, 2009), farm women may experience drought disasters differently than men.

Research done by Reinsch (2009) in Canada on Manitoba farm shows that, women's experiences of the droughts of 2001/2002, Reinsch (2009) found that farm women experienced high levels of

stress as a result of the disaster. The women's stress was due, in part, to their lack of control over major farm decisions and coping strategies (Reinsch, 2009). Historical sources, including farm women's own accounts of past droughts, also provide some insights into the gendered dimensions of droughts in a historical framework.

Bye (2005), argued that farm women in Namibia actively reinforced gendered roles and ideologies during droughts, which had the effect of reproducing gendered inequalities and, therefore, gendered vulnerability which leads to gendered adaptation. Women and men can be similarly exposed to the same climate conditions and contextual differences including gendered divisions of labour, which can produce different degrees of sensitivity and different forms of adaptation (Leichenko & O'Brien 2008; Milne, 2005).

Programmes to reduce vulnerability and encourage adaptation are necessary, but they are only helpful if they are attentive to local social and gender orders. Programmes should not exacerbate existing forms of inequality in the community and they should, when possible, challenge these inequalities. It is therefore necessary to understand the gendered dimensions of droughts to create culturally appropriate and gender-attentive approaches to future droughts.

2.7.1 The linkages between gender, drought and adaptation

Droughts affect different communities, households and individuals in different ways. The ability to act in response to, and in anticipation of droughts (understood as a person's adaptive capacity) involves having: access to and use of information and services; control over assets; access to institutions and entitlements to key resources; the ability to innovate in response to evolving challenges and opportunities; and flexibility and foresight in planning and decision-making.

It is often said that women are more vulnerable to drought impacts than men are. But gender dynamics may not be discussed in planning processes as practitioners assume that they know what the problem is, i.e. the vulnerability of women and addressing fundamental power imbalances is not necessarily on the agenda (Anderson, 2009). According to Itemba (2013), adaptation interventions are often based on the belief that women's role in the home makes them critical agents of change and, thus, a focus for adaptation interventions. But many women do not have decision-making power within the home or over all household resources, and they may not be able to keep or manage their own earnings. Even in some female-headed households, social stigma may prevent women from being treated as economic or social equals, despite their sole management of their livelihoods (Itemba, 2013).

Poor and marginalised women and men face multiple and complex challenges with insecure livelihoods, conflict, natural disasters and the degradation of natural resources exacerbating and reinforcing poverty and marginalisation. Drought is now undermining already fragile ecosystems and livelihoods, and changing natural disaster patterns, leading to competition for and conflicts over resources, and this hampers development gains (Nelson, 2011).

Unequal distribution of resources and power imbalances in the home and the community are at the root of poverty and marginalisation for women and men. The capacity to adapt to droughts and the changing dynamics between women and men interact and overlap because both are shaped by the distribution of resources and power between different social groups (Nelson, 2011).

Masika (2002) points out that, improved gender analysis and gender mainstreaming have led to a greater understanding of gender inequality in relation to droughts. However, much gender related

research and many projects, recommendations and policies are based on generalised perceptions of gender dynamics and gender stereotypes. Women's and men's roles, aspirations, access to and control over resources, and influence over decision-making play a strong role in determining social power relations, usually to the detriment of girls' and women's life chances. These dynamics change over time women and men have many different roles in their lives, including as spouses, siblings, co-workers and parents. In each role, women and men may act together or separately depending on their own concerns (Masika, 2002).

2.7.2 Gender considerations to droughts adaptations

Adaptive capacity has been noted to be dependent on factors like wealth, technology, education, information, skills, infrastructure, access to resources and management capabilities (Olawoye, Okoye & Eleri, 2010). Enhancing adaptive capacity is a way of reducing vulnerabilities and promoting sustainable development in a gender specific manner.

According to FAO as cited in Olawoye *et al.,* (2010), methods that can assist in engendered droughts adaptation activities at local/community level include: use of participatory approaches to involve all members of the community in planning, and understanding local gender roles including different levels of vulnerabilities; drawing on local knowledge which is linked to men and women's gender differentiated roles; and enhancing local capacity to adapt.

Dankelman (2008) is of the view that gender dynamics play a significant role in influencing which resources women and men can access and in determining the capacity to adapt with the outcomes of droughts. Projects for adaptation, including mitigation activities like clean

development mechanisms (CDM), capacity building, technology transfer and vulnerability studies should target the poor – the majority of whom are women (Olawoye *et al.,* 2010).

Too often women are primarily perceived as the main victims of droughts and not as positive agents of change and contributors to livelihood adaptation strategies. But Enarson (2000) and O'Brien (2007) noted that natural disasters could also provide women with a unique opportunity to challenge and change their gendered status in society. In general, according to Grossman and Owren (2008), women have proven effective in mobilizing the community to respond to disasters, and also in disaster preparedness and adaptation. Women usually have fewer assets than men to recover from natural disasters, and usually they do not own land that can be sold to secure income in an emergency. Among the problems women identified when having to adapt to droughts are lack of safe land and shelter, lack of other assets and resources, limited access to material and financial resources, lack of relevant skills and knowledge, high prices of agricultural inputs and other materials, and cultural barriers limiting women's access to services (Mitchell, Thomas & Lussier, 2007).

However, worldwide women are starting to adapt to droughts and they can articulate what they need to secure and sustain their livelihoods more effectively. For example, in studies by Mitchell et al. (2007) and Patt, Angie Pablo (2007) from areas where droughts was problematic, women's adaptation and coping strategies, and mechanisms included: moving to safer places; saving their assets; trying to store seeds and moving livestock for grazing; dietary adaptations; skip meals in order to preserve food to be used in the lean time; adapting their agricultural practices - e.g. switching to other crops and varieties that are drought resistant, multiple cropping and intercropping practices; earning income or saving money: working as wage (bound)

labourers; borrowing money from money lenders at high interest rates, secretly saving part of their earnings, or distress sale of livestock; alternative health care: the use of traditional medicine; and organizing and collective action - e.g. setting up of community-based self-help groups and networks, and group savings, or systems of group labour.

However, not all adaptation strategies are sustainable; for example, adaptation resulting to skipping diets, or money lending can result to more serious stress, especially on health. In most cases, women often have a clear sense of what they need to adapt better. In studies carried out by Oxfam (2005) and Mitchell et al. (2007), women have voiced their priorities in times of disaster: as safe areas, shelters, and adaptation; the storage of their harvest and livestock, adaptation in agricultural practices, including crop diversification, better access to information, access to services such as doctors and pharmacists, and agricultural extension, development of their capacities through training and information (including through exposure and exchange visits about adaptation strategies and livelihood alternatives), access to resources, including climate-related finances (Skutsch, 2004), and improved access to credits and markets.

Gender, droughts and adaptive capacity are intricately linked. Poor and marginalised women and men face multiple and complex challenges. Droughts further exacerbate these challenges and threaten to erode development gains made to date. Unequal distribution of resources and power imbalances are both the root cause of poverty and also influence on a person's capacity to adapt (Aguilar et al., 2008). There are many different factors which shape inequality across gender, ethnic, cultural or religious groups and therefore also determine the different ways in which drought impacts individuals, households and communities. Differences in access to information,

control over resources and the ability to innovate in response to climate challenges such as droughts determine a person, household or community's ability to adapt (Skutsch, 2004).

Furthermore, their different roles give women and men different knowledge, priorities and concerns in relation to droughts. Adaptation interventions are often based on the belief that women's roles in the home make them critical agents of change and, thus, a focus for adaptation interventions (Aguilar, 2007; Bradshaw, 2004). But many women do not have decision-making power within the home or over all household resources, let alone over valued livelihood resources, and they may not be able to keep or manage their own earnings. Even in some female-headed households, social stigma may prevent many women from being treated as economic or social equals, despite their sole management of their livelihoods (Aguilar, 2007; Bradshaw, 2004). According to Enarson (2000), these barriers tend not to be addressed by droughts adaptation programme, which can inadvertently entrench gender inequality and even increase women's workloads. Drought effects can require women and men to take on different roles and responsibilities; and adaptation interventions can do the same. Impacts on household livelihoods, asset base, human and animal health and intra-household relations are driving some households and communities to change their lifestyles and roles, and these changes have different impacts on women and men. Adaptation strategies that are used to help communities manage an already unpredictable climate are becoming unviable (Enarson, 2000).

Furthermore, O'Brien (2007), noted that men and women are taking on new roles and responsibilities, and they are starting to work together in different ways to adapt to change. Some women and men have aspirations for a different future for themselves and their communities, and this can be an important driver of change. Changes in livelihoods strategies - with

innovations and risks inherent within them - create new spaces for women and men to engage differently, which in turn shifts expectations and perceptions of their roles. Despite these changes, access to productive assets and networks remains uneven, and household workloads and decision-making power have not shifted to respond to this change. This can lead to increased burdens of work for women, without a shift in control or influence (O'Brien, 2007).

2.8 The feminization of male-dominated sectors and gendered adaptation

Many researchers indicate that men and women have different coping or adaptation strategies. Few researchers focus on one specific adaptation activity, and suggest that men and women play different roles in the implementation of a given adaptation (Eriksen et al., 2005; Ziervogel et al., 2006; Cassidy & Barnes, 2012; Molua, 2012; Pangapanga et al., 2012). In Mozambique and Mali, migration was identified as a clearly male-dominated strategy (Silva et al., 2010; Djoudi & Brockhaus, 2011; Brockhaus et al., 2013; Djoudi et al., 2013).

In South Africa, differences were reported in the strategies adopted by men and women. For instance, women were more informed than men in their agricultural choices, on issues such as suitable crops for home consumption and trade (Ziervogel et al., 2006).

In Tanzania and Ethiopia, women were found to be less engaged in adaptation practices based on tree plantations (Deressa et al., 2009; Below et al., 2012). Among teenagers psychologically affected by droughts in Australia, girls have significantly higher levels of prosocial behaviour than boys (Dean & Stain, 2010).

In Malawi, there are gender differences related to the choice of improved varieties, shifting of planting dates, irrigation farming, and income-generating activities (Pangapanga et al., 2012).

In Cameroon, female-headed households are less likely to plant trees (as a protective measure) or rebuild homes (Molua, 2012). In Kenya, gum and resin collection is one of the most popular strategies adopted by women, children and impoverished people (Gachathi & Eriksen, 2011).

The diversification of livelihood activities is known to be an important strategy for reducing household vulnerability, particularly for activities that are not weather dependent. Several studies document the gender limitations to diversifying activities and livelihoods. However, the link between the available choices for different groups and gendered social roles and norms has not been well assessed. Few studies refer to context-specific, cultural limitations or to the options that women and female-headed households are culturally allowed to choose and implement. The prevalence of socially driven gender inequity is reflected in the relatively limited choices and strategies that many women feel that they are allowed to adopt.

Some studies document that female-headed households are often constrained to engaging in low-benefit, low-risk activities, due to their exclusion from high-benefit, low-risk activities, such as formal employment, which are mostly male dominated (West et al., 2008; Molua, 2012).

Djoudi and Brockhaus (2011) suggest that long-term strategies for women are based on education and formal employment, but that short-term community strategies hinder them from making the shift away from high-risk, low-benefit strategies. Education seems to ensure access to better incomes and provide access to other assets required to adapt, as many studies suggest. The probability of selecting resilient pathways is highest for an educated, middle-aged, male farmer, while female-headed households face significant socio-economic and cultural constraints, which limit their ability to choose resilient strategies (West et al., 2008; Molua, 2012). Pastoralism and migration are both important strategies in several drought-prone

regions, and are more resilient strategies than rainfall-dependent agriculture. Both sectors are mostly male dominated (West et al., 2008; Brockhaus et al., 2013).

Adaptive strategies with gender differentiated outcomes as cited in Locatelli (2016), provided further analysis of the gender differentiated impacts of adaptation strategies (Locatelli, 2016). The negative impacts of some strategies on women were described in some studies such as in the study of: The diversity of gendered adaptation strategies to climate change 2016. Itemba (2013) indicated that in Senegal, the introduction of irrigation technologies to adapt to drought increased many women's dependency on men and male control, in contrast to the traditional cultivation system which allowed women to be independent, own-account farmers. Under this traditional system, their work was neither supervised nor dictated by males. In Mali, a research by Djoudi and Brockhaus (2011) found that women belonging to a higher social class were culturally not allowed to take over male-dominated activities after men had migrated.

According to several journals such as the Gender and intersecting inequalities in climate change studies by Djoudi (2016), migration is a male-dominated strategy expected to impact gender relationships. The question of whether the migration of men has a negative or positive impact on gender relationships is controversial and certainly context dependent (Hecht et al. 2015). Some studies have documented the impacts of migration on the feminisation of traditionally male-dominated sectors, for instance, livestock and pastoralism. The livestock mix follows a trend towards a greater number of small ruminants and fewer cattle (Sungno, Niggol & Mendelsohn, 2006). This trend is associated with drought-related adaptation and results in more women being involved in the livestock sector (Turner, 1999). This is a good example of how the strategies of men, in a context of unequal decision making, can have gender-mixed and complex

outcomes. Hence, further studies are required to examine the feminisation of male-dominated sectors as a result of coping and adaptation strategies.

2.8 Intersectionality approach in drought adaptation

St. Clair (as cited in O'Brien et al., 2010, p.181) states that "the regions, communities and individuals that are already being affected by droughts and will be hardest hit in the future are those with the least capacity to cope with the consequences." The interaction between droughts, livelihoods, poverty and gender roles matter in drought discourses. A research by Drucker (2000) indicated that education, gender, age, household level of income, information and social capital influence the choice of adaptation strategies (Deressaa, Hassan, Ringler, Alemu and Yesuf, 2009). Women and men are affected by droughts differently and adaption strategies therefore also vary. Their ability to adapt to droughts depends on access to resources. Some resources can be income, employment, technology, skills, education, infrastructure, management and capabilities (Masika, 2002). Different household structures adapt numerous strategies to adapt with droughts effects and their access to certain resources decides how they are adopting to droughts. For instance, the degree of access to natural resources, such as land, livestock and water typically decide their vulnerability. Furthermore, human resources, such as education, family, heritage, skills and training determine how vulnerable they are. Subsequently, social resources such as social networks, clan, and local institutions participate as well in deciding the degree of vulnerability. Infrastructure, politics, economic resources, land ownership and land rights also contribute. Women have fewer rights to land and they have insecure access to land because their rights are poorly defined. So, there is a gender dimension to adaptive capacity because of lack of equal participation in the decision-making processes (Nelson, 2011).

Nonetheless, it is confirmed in the Kilimanjaro region in Tanzania that women are becoming decision makers relating to issues about adaptation strategies (Ravera, 2016). For example, their participation in water committees and cooperation with NGOs in the area brings forth the voice of women. Even though the adaptation capacity for women is in the very early stages, attempts by women have proven to be helpful in adaptation to droughts. Activities such as green water harvesting, using drought resistant crops and preservation of moist land have contributed to women's control over adaptation strategies and agriculture (Itemba, 2013). Although this is not the case in Mwamanimba and Mwashata in Kenya, where the women are not engaged in any participatory projects or adaptation focused committees, the rural women have found ways to adjust themselves. By means of survival they develop their own agency and use of local knowledge which strengthens their local adaptive capacity. But, since they lack overall access to resources they are unfortunately unable to influence collective decision-making with their own adaptive strategies. The men are the ones currently shaping social relations and decide the adaptation strategies, both for women and men. This is a barrier towards women's empowerment.

2.10. The conceptual and theoretical framework of the study

The central concepts of this thesis are defined through review of available literature and theories, keeping in mind the research objectives, with special focus on the concepts of gender, drought and adaptation. These main concepts are relevant for treating the research objectives, as this study focuses on answering questions about men and women's gendered adaption to droughts.

This study uses the "Sustainable Livelihoods Framework" and the "Harvard Analytical Framework" (March, Smith & Mukhopadhyay, 1999), to analyse links between gendered

adaptation and droughts and the gender division of labour or gender roles in Olukonda constituency. These conceptual theoretical frameworks are used as a type of intermediate theory that attempts to connect all aspects of the study (e.g., problem definition, purpose and questions, literature review, methodology, data collection and analysis).

These frameworks act like a map that gives coherence to empirical findings and analysis. These also represent the foundation of the research topic, from which further data collections are deduced. The analytical framework guiding this study draws upon adaptation and coping livelihoods approaches, as this study looks at understanding how the modes of adaptation and coping strategies differ between men and women in the Olukonda constituency which was selected for the study.

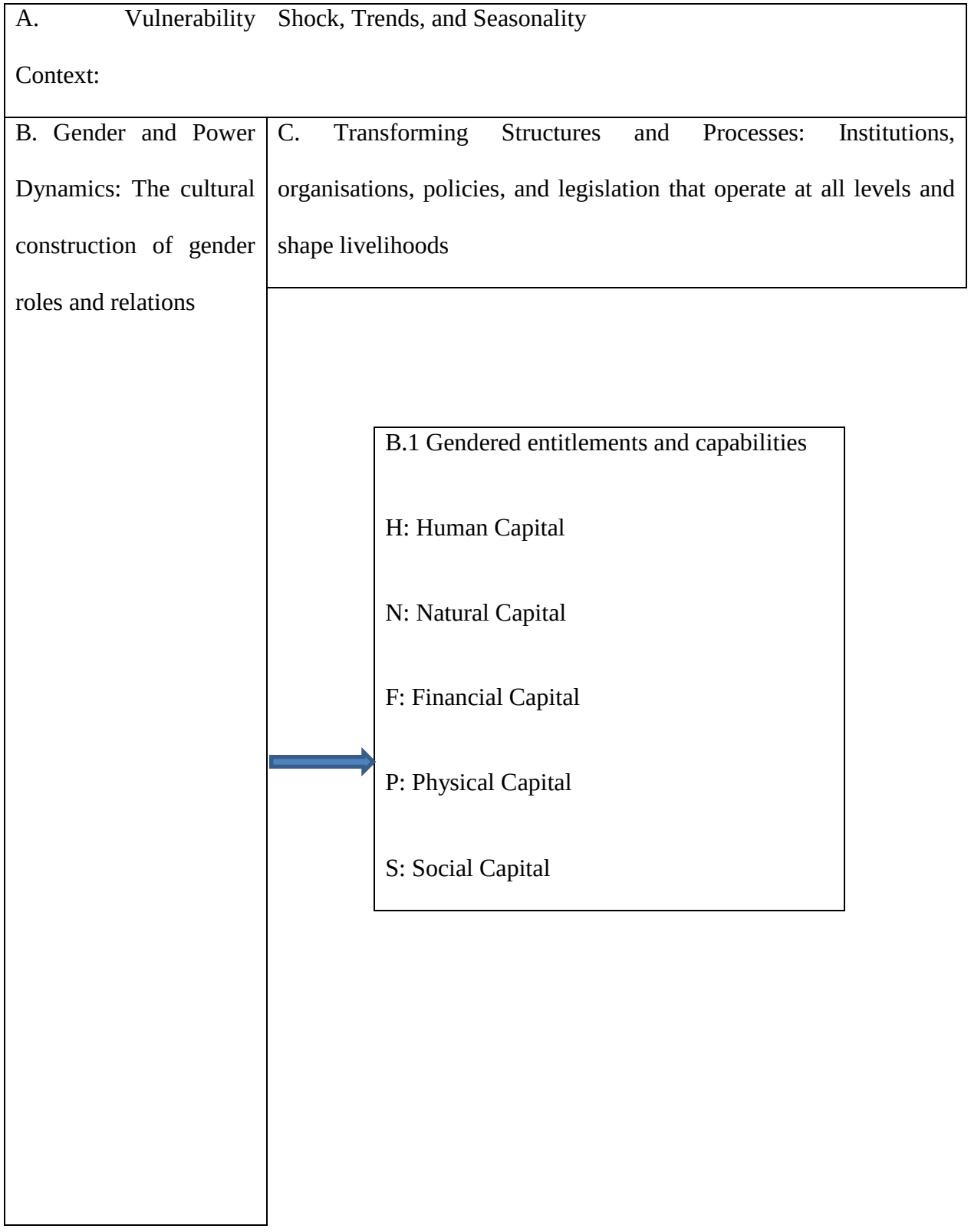
The concept "gender" refers to the 'socially constructed' roles, behaviours, aptitudes, and relative power associated with being female or male in a given society at a particular point in time (Esplen, 2009,). In the analysis of droughts, the gender approach is necessary to understand not only how the identities of women and men determine different capacities to cope with droughts impacts, but also how to tackle both the causes and consequences of droughts. It is recognised that people who are already the most vulnerable and marginalised experience the greatest impacts (IPCC, 2007). At the same time, they have the least capacity or opportunity to prepare for the impacts of droughts (Bridge, 2008). As women constitute the largest percentage of the world's poorest people, they are the ones who experience the greatest impact of these changes they are least responsible for. There is little existing research that explores the linkages between droughts and gender. More recent research is with regards to the integration of the gender-sensitive s in the understanding of drought (BRIDGE, 2008).

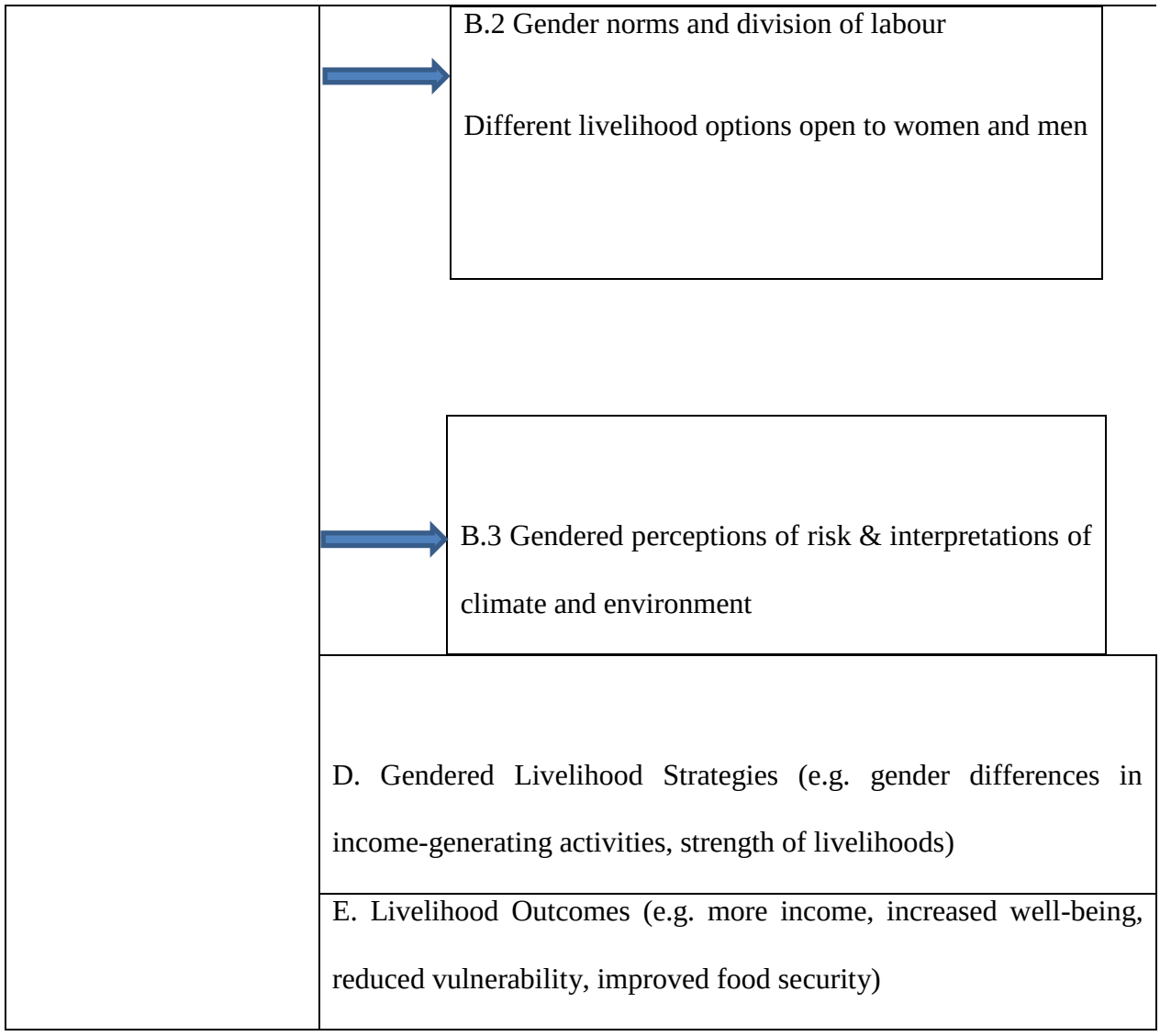
Since this study focuses on answering different questions about men and women's adaptation and coping strategies, the Sustainable Livelihoods Approach (SLA), including both the Sustainable Livelihoods Framework (SLF) and gender theory, are used. SLA has been influential within the field of international development in expanding our understanding of the vulnerability context, the policies and institutions which affect actions of individuals and households, and the diverse livelihood strategies undertaken by women for their households. The SLF is a tool to improve our understanding of livelihoods, particularly the livelihoods of the poor and women who are among the most vulnerable to droughts effects, and when used with participatory research methodologies, it becomes useful to analyse complex rural realities (Oxfam, 2009).

The gender analytical framework is used to analyse what and how gender relations can be shaped or changed in the process of adaptation. SLA framework was developed by Department for International Development (DFID) of the United Kingdom, UNDP, and NGOs (e.g., CARE, Oxfam, etc.), and it is considered an important tool to improve the understanding of livelihoods, especially livelihoods of the poor and women who make up a large proportion of the poor.

Figure 1 below describes the SLF, which presents the main factors that affect women and men's livelihoods and typical relationships between these factors. This framework shows that livelihoods are shaped by a multitude of different factors and forces, which include "vulnerability context", "gender and power dynamics", "transforming structures and process", "livelihood strategies", and "livelihood outcomes", that are all constantly shifting, but are ultimately centred on gender and droughts. Gender-centred analysis begins with a simultaneous investigation of men and women's assets, their objectives (i.e. the Livelihood Outcomes which they are seeking), and the Livelihood Strategies which they adopt to achieve these objectives.

Figure 1: Gender and climate change analytical framework





Gender and Climate Change Analytical Framework as a Research Method of this Study

Source: DFID (1999) and Oxfam (2009).

The above mentioned SLA outlines the gender dimensions of droughts which guides this study. At its core, it emphasises a gendered analysis of farmers, entitlements, capabilities, division of labour, livelihoods nature, opportunities and perceptions. These are the primary properties addressed by this study's research questions, specifically examining the gender roles, responsibilities, and decision-making power which shape the livelihood strategies available to

women and men in Olukonda constituency as the relevant case studies. The investigation is focused on how local stakeholder activities, population trends, resource trends, a changing climate, and natural resource endowments all contribute to the relative vulnerability of men and women, their households, and communities in the study area. This study also concentrated on understanding the types of livelihood strategies that are employed by women and men in the area; what factors constrain them in their choice of livelihood strategies, with crop production and livestock as targeted schema; and how these choices impact on their livelihood outcomes. In order to understand gender-sensitive adaptation strategies, this study focuses more on gender differences in the impacts of droughts as well as on gendered roles and capacities in coping with these phenomena. Women face particular constraints in their capacity to adapt to existing and predicted impacts of droughts. In fact, gender-related patterns of vulnerability mean that the impacts of droughts are different on women compared to men. As such, gender-sensitive priorities and processes would be mainstreamed at all stages of this study around the impacts of drought and adaptation strategies. Equally important for distillation and analysis of existing mechanisms is for droughts adaptation designed to promote women's participation in disaster risk reduction to be gender-sensitive in the study area. Particular attention is given to documenting the different participation patterns of women and men, to inform targeted adaptation strategies which poor women and men need for their security. To date, little attention has been paid to the ways in which gender has an effect on people's lifestyles and livelihoods and the impact this has on droughts in the selected communities. This study seeks to address this gap in our knowledge base and support droughts planning and decision making.

2.10.2 Harvard analytical framework

The Harvard Analytical Framework was used to analyse women and men's activities and their roles in them. The Harvard Analytical Framework is often referred to as the Gender Roles Framework or Gender Analysis Framework (March, Smyth & Mukhopadhyay, 1999).

The Harvard Analytical Framework is used to collect information from the community and from households. It describes who does each activity, who has access and control of resources and the influences on gender roles. The *Activity Profile* answers the question "Who does what?" for all relevant productive and reproductive tasks. The *Access and Control Profile* identifies the resources used in the tasks identified in the *Activity Profile*, and defines who has access to these resources and who controls their use. It also identifies the benefits that are realized from each activity, and who has access to and control over these benefits. The final *Influencing factors* section identifies factors that cause the differences of roles of each gender identified in the two profiles. These may indicate areas where there is opportunity to change gender roles.

The framework aims to show that there is an economic motivation for investing in both men and women. It also aims to help planners to design more efficient projects as well as improving overall productivity. According to March, Smyth and Mukhopadhyay (1999), these aims give an understanding of how the framework works and its importance, as it aims to highlight the differences between men and women and so highlights the allocation of resources. Thus, it is ideal to understand the gender and power relations between men and women in any community where the framework is being applied. Only by understanding how these gender and power relations operate within the community under examination will we be able to understand the

gender division of labour. Thus, the framework also reveals who has the power in deciding who does what and how much time is spent on an activity (March, Smyth & Mukhopadhyay, 1999).

This framework is aimed at improving the lives of the community it is used in, and developing projects with an aim at long-term development and reducing inequality between men and women. However, for the purposes of this study, the Harvard Analytical Framework was used as an analysis tool to explore the gender roles during droughts between men and women of Olukonda constituency. By using this tool, the researcher is able to clearly see any gender lines when it comes to dividing up tasks in this community under study.

Strengths and weaknesses

Being neutral and fact-oriented, the framework is useful in starting discussions on gender-related issues with people who otherwise resist thinking about the balance of power between men and women. It is also useful in presenting information to people who tend to see decisions in economic terms. The framework best applies to projects addressing agricultural or rural based communities, or that are seeking poverty reduction through implementing a sustainable livelihood (Pittman, 2011).

Pittman (2011) highlighted some weaknesses of the framework by pointing out that the Harvard Framework focuses on projects rather than programmes, and on efficiency rather than effectiveness. It does not help identify strategic gender needs and it gives no guidance on changing gender inequalities. The framework assumes that gender needs should be addressed for the sake of economic efficiency, and gives less importance to the concepts of equity, power relations or decision-making processes. The top-down check-box approach leads to

simplification, ignoring the subjects' analysis of their situation and ignoring factors such as race, class, ethnicity and other types of relationships, essential in progressing efficiency itself.

By focusing on the specific gender aspects of activities, the researcher is able to identify the tasks men and women do and how the division of these tasks is done. Therefore, it is a gender specific tool in identifying and analysing the activities of men and women. March, Smyth and Mukhopadhyay (1999) outline that the Harvard Analytical Framework is an instrument that is used to measure women's and men's activities in a community, by measuring who does what activities and how much time they spend on those activities. It looks at how the division of labour is based on sex and not on the ability to perform a task. Moreover, it is used at the micro-level or family level and it identifies the productive and reproductive activities.

2.11 Conclusion

This chapter describes the analytical framework that was used to analyse the impacts of droughts on men and women in Olukonda constituency, as well as how these impacts are not felt equally by other constituencies in Oshikoto region. Adaptive capacity is differentiated along gender, and drought livelihood impacts are gendered. Women are not only victims of climate phenomena, they are also "powerful agents of change" (UNDP, 2007). The SLF offers a way of thinking about livelihoods that helps order complexity and makes clear the many factors that affect livelihoods in the study area. This tool focuses our attention on the underlying processes of poverty as well as taking into account a wide range of factors that cause or contribute to poverty. This framework does not provide an exhaustive list of the factors and forces to be considered and as it continues to develop as a flexible approach, it is expected to lead to the identification of major constraints to, and opportunities for, poverty reduction in the targeted area of study. The

field study intended to provide insights into adaptation strategies of the Olukonda communities and a gender based analysis is presented in the following sections of the thesis to demonstrate how women's and men's strategies differ and that the options open to them vary, particularly in crop, natural resources and livestock production. All main factors and points, except the Transforming Structures and Processes, that affect women and men's livelihoods and relationships between these factors and points, are considered in this study. Because this analytical framework aims to provide the key aspects of climate change and gender linkages which need to be understood clearly, it fits well with the ultimate aims of this study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The purpose of this research is to explore the farmers' adaptation strategies to droughts in Namibia's north Oshikoto Region amongst the farmers in Olukonda constituency. A qualitative approach was chosen as a research design in order to achieve the research objectives, and the qualitative approach was chosen because it could generate data that were needed. Shank (2002) defines qualitative research as "a form of systematic empirical inquiry into meaning". By systematic it means "planned, ordered and public", involving gaining insight into how people live and experience social and personal life. This type of inquiry is grounded in the world of human experience and inquiry into meanings by making sense of human social experiences. Therefore, the qualitative approach was used in this study to gain some perspectives about the rich and in-depth experiences of different famers.

This chapter outlines how the research was conducted and how the data were collected. It focuses on the research design, research population, sample size as well as the research instruments used for data collection. It also presents the procedure employed and the manner in which data were analysed. For the purpose of this study, a phenomenological approach was the research design used for this research. The research designs used in this study were the qualitative, phenomenological approach, explorative and descriptive designs.

3.2 Research design

This thesis sought to explore how men and women of Olukonda constituency adapt and cope with droughts. It has been emphasised that "researchers who desire to explore the meaning, describe and promote understanding of human experiences such as coping and adaptive strategies typically use qualitative research designs (Van Der Walt & Van Rensburg, 2006,). For the purpose of this study a qualitative, phenomenological approach was used throughout the research process.

The phenomenological approach in this study allowed the participants, through in depth, face-to-face semi-structured interviews and focus group discussions, to express their own experiences of droughts and how they adapted to droughts impacts (Van Der Walt & Van Rensburg, 2006; De Vos, 2007; Mamabolo, 2009; Handbook of Phenomenological Aesthetics, 2010).

The phenomenological approach was used to analyse the conversations and interactions that the researcher had with the men and women, key experts and development partners on drought adaptation. This study attempted to understand the participants' experiences, coping and adaptation strategies. This approach allowed the direct exploration of the phenomenon as consciously experienced and narrated by those who lived it. The researcher eventually reduced the experiences to a central meaning to capture the essence of the experiences of the participants (De Vos, 2007; Meriam, 2009).

In order to obtain the specific information needed to understand the gender dynamics of drought adaptation; data collection methods were needed and used together. The tools that were chosen were identified because they were the best possible research instruments to be used. Semi-structured interviews were conducted with each participant in order to gain more insights into

their experiences of drought and how they cope and adapt, and also to identify the gender dynamics and decision-making factors in their households. This is one of the important aspects to understand how tasks are divided within the home, and also to determine if there is an equal division of labour and participation in the gender roles. And finally, the "Sustainable Livelihoods Framework" and the "Harvard Analytical Framework" was used to de-code the gender roles and to identify similarities and differences in tasks between men and women during the drought seasons. This was used to make it clear how tasks are divided up and to see whether there is a sharing of a certain task, or whether one spouse is entirely responsible for certain tasks in the home. With the use of the "Harvard Analytical Framework" the researcher was able to see how many tasks the women have in common, and how much the men have in common as this is more plausible in a qualitative approach.

Defining these instruments makes it more understandable as to why they were chosen for this specific topic:

Semi-structured interview: According to Mason (2004) semi-structured interviews are characteristically defined as being flexible and they have a fluid structure, which is different from structured interviews. The semi-structured interview made use of open-ended questions in order for the researcher to obtain as much information as possible from the men and women. These interviews were recorded using a voice recorder and then transcribed as part of the data analysis process.

Harvard Analytical Framework: The Harvard Analytical Framework was then used to analyse the gender roles to see the differences and to make comparisons between men's and women's activities. According to March et al. (1999), the goal of the Harvard Analytical Framework is to map out the work and the resources that, men and women in any community have and so

highlight the core differences. It is designed to be a grid (which is also known as a matrix) for collecting data at the micro-level of society.

Due to the fact that the focus was mainly on men and women in Olukonda constituency, the Harvard Analytical Framework was ideal to look at the activities in their homes as this is mainly used at the micro level which is the intended use of this instrument.

Sustainable Livelihoods Framework: The SLF presents the main factors that affect women and men's livelihoods and typical relationships between these factors. This framework was used to show that livelihoods are shaped by a multitude of different factors and forces, which include "vulnerability context", "gender and power dynamics", "transforming structures and process", "livelihood strategies", and "livelihood outcomes", that are all constantly shifting, but are ultimately centred on gender and droughts.

3.2.1. Qualitative design

In order to achieve the research objectives, a qualitative research approach was used for this study. Burns and Grove (1993) describe a qualitative approach as "a systematic subjective approach used to describe life experiences and situations to give them meaning". Qualitative research refers to the meanings, concepts and description of a phenomenon and this research was primarily interested in individuals and their life-worlds (Berg & Lune, 2013). Therefore the researcher used qualitative research design because the purpose of the study was to study a social problem; the aim was to capture people's perceptions, descriptions, meanings, belief systems, their life stories and experiences of how men and women adapt and cope with droughts.

The research concerns rural people's adaptation strategies to drought and gender roles in Olukonda constituency. The research explores how gender roles are changing due to the impacts

of droughts and what this implies to men and women's adaptive capacity. As a qualitative researcher, the interest was on how farmers cope and adapt to droughts as well as how men and women organise their household activities and how they use their gender roles to adapt to droughts. The reviewed literature has emphasised women's vulnerability to droughts, which challenges their adaptive capacity. However to better understand women's perspectives, men were also central in the data collection. The research emphasis was on how the roles of women have changed but in order to do that the transformation of roles of men was also important.

For the purpose of this study, the qualitative design (Gorman & Clayton, 2005; Padgett, 2008) was applied in order to explore the experiences of men and women, the regional councillor and development partners who are dealing with the drought impacted communities in Olukonda constituency. The qualitative methods of gaining access to research participants were in-depth, face-to-face semi-structured interviews, focus group discussions and a review of existing literature. The qualitative design rested on the assumption that a valid, holistic understanding of the gendered adaption to droughts could be gained through accumulated knowledge that was acquired first-hand by the researcher alone. The researcher could tell the story from the point of view of the participants rather than as an expert who passed judgment on them (Williams, 2005; De Vos, 2007).

The point of this study was to explore the relevant aspects in much depth and detail, and from such multiple perspectives and meanings, that there was less need to worry about whether one particular measure was really measuring what it was intended to measure (Rubin & Babbie, 2011). The qualitative design was used to emphasise the respondents' point of view of the adaptation strategies used by men and women in times of droughts. The researcher attempted to describe and understand rather than to explain and predict the droughts adaptive strategies.

3.2.2 Population

The population in this study comprised of men and women who have experienced droughts, together with key experts working in the field of droughts adaptation and the development partners supporting the men and women to cope and adapt to droughts impacts (Strydom & Delport, 2007). A population is a group of potential participants who have similar characteristics (Welman, 2005). The population of the study is households from three villages within Olukonda constituency. Olukonda constituency has a population of 9,559 people which is divided into 20 villages; from the 20 villages three villages were randomly selected. The villages were selected because they received drought relief food and other drought relief services from the constituency councillor's office, and they have reported themselves to the village head men/women that they are impacted by drought and they are unable to adapt and cope with the drought.

In this study, the unit of analysis comprised of farmers that were selected from the drought relief affected households list from the constituency councillor. The households to be interviewed were nominated by the village head men and head women, because the head men and women know their community well and they were in a better position to point out the houses that are most vulnerable to drought than the others. The households selected for the ten key informants were selected from the list of seven governmental offices and twelve stakeholders that assisted the drought affected households and the households that were relocated because of the floods.

3.3. Sampling strategy

Strydom and Delport (2007) define a sample as "the small portion of the total set of objects, events or persons that together comprise the subject or study". A sample is also described as "the what or whom" being studied. The researcher understands sampling as a process of selecting the "best-fitting" people to provide data for a study. The researcher used non-probability, purposive

sampling methods to select the participants or farmers. Purposive sampling was suitable in the sense that the researcher would be able to select the most eligible participants for the study (Welman, Kruger & Mitchell, 2007).

The criteria for inclusion in the sample for the study were: the participants should be farmers, and should have experienced droughts in Namibia's 2013, 2014, 2015, and 2016 droughts. The participants can either be male or female and the participants should belong to a household within the Olukonda constituency.

The researcher used the non-probability sampling and purposive sampling technique to procure a sample of the famers who were used for the research hence all farmers in Olukonda were affected by the droughts.

The sample was selected from three villages within the constituency of which fifteen farmers were interviewed. This was done as a step to sample individual household farmers. Since the interviews were done at the time when farmers were busy with cultivation, the researcher approached the farmers that were busy in their *mahangu* fields. The researcher approached men and women who were willing to take part in the study. Men and women from 20 to 70 years of age were interviewed. The men and women between 20 and 70 were interviewed because they are within the age range that is mostly home owners and is mostly likely to unemployed.

The focus group and key informants were interviewed in one group because they belonged to the same committee (Community Development Committee). The group consisted of one person from each institution: one Constituency Councillor, one Chief Administrative Officer, one Administrative Officer, one representative from the Olukonda Traditional Leaders, one representative from the Ministry of Agriculture, one representative from the Ministry of

Education, one representative for people living with disabilities, one Youth representative and a representative from each centre within each village in Olukonda constituency (five centres). Purposive sampling and non-probability sampling strategies were applied in this study because they purposely sought potential research participants on the basis of the researcher's judgement about which ones would be most useful or representative (Williams, et al., 2005; Rubin & Babbie, 2011; Babbie, 2011).

The researcher had to make sure that good rapport was established by properly introducing herself to the participants and by explaining the research to the participants as well as the purpose of the research, as this would help to pave way and lay a foundation for a good and a trusting relationship. As mentioned above, the researcher had to introduce herself to the potential participants. It was therefore necessary to explain the purpose and the procedures of the research and also to determine their willingness to participate in the research.

3.4. Research instruments

The research used the following research instruments to collect data: open-ended and descriptive schedules of questions during interviews, observations, and audio recording. The aim of the interviews was to understand the modes of adaptation to droughts by men and women and how the modes of adaptation were related to gender roles.

An interview schedule, voice recorder and observation sheet were used for data collection. The interview schedule provided the researcher with a set of predetermined questions that were used as an appropriate instrument to engage the participants and set the narrative terrain related to the research topic (Babbie & Mouton, (2012). The research instruments were pre-tested then revised according to the suggestions made during pre-testing before the actual data collection exercise.

This was achieved by conducting a pilot study to evaluate the competency of the research tools to be used in the farmers' interviews. A sample of two participants, one male and one female from Olukonda constituency were selected and interviewed as a pilot study.

Semi-structured open-ended questions were used to guide and facilitate the interview process, and this structure enabled the researcher to ask new questions as the interview situation suggested, thereby gaining in-depth insights and meanings about the phenomenon being studied (Creswell, 2014). The interview guide used during the individual family members' interviews is attached as Annexure 1.

3.5. Data collection process

The data was obtained through the face to face in depth interview methods which were used for the purpose of data collection. According to Fossey et al. (2002), interviewing, key informants and participant's observation are common modes of qualitative data gathering. In this research, data were collected by means of semi-structured interviews with the aid of the interviewing guide with the farmers.

Preparation for the data: the researcher started the process for data collection by seeking permission from the Olukonda constituency councillor introducing her research to the councillor. The researcher conducted house to house visits to the farmers' households. The purpose of this visit was to request the participants to take part in the study.

The research guide comprised of two sections, namely for collecting information on the participants' droughts-experiences and their modes of adaptation to droughts, and the section for the gender roles performed at the household level.

According to Holloway and Wheeler (1999), pilot studies are not usually used in qualitative studies but novice researchers can conduct interviews as a pre-exercise, to get used to the type of data being collected. A pre-exercise was done to orientate the researcher to the research project and provide the researcher with insights into the phenomenon. A pilot study ensures that errors can be rectified at little cost.

The pilot study was conducted with two participants who met the selection criteria. The farmers sampled for the pilot study had vast knowledge about droughts and they had lived in Olukonda all their lives, and the farmers had experienced the 2013 to 2016 droughts. Both farmers were from Olukonda constituency and they were interviewed at their houses. The interview was voice recorded to ensure the correct use of the voice recorder and to listen to the researcher's problems with probing and verbal reactions. During the exercise, attention was also given to body language and non-verbal responses as well as the manner of asking questions.

An interview is defined as a conversation with the purpose of gaining an understanding of the perspectives and experiences of the person being interviewed (Tutty et al., 1996). Holloway Wheeler (1996) explain that a semi-structured or focused interview makes use of questions that are contained in an interview guide (not a schedule, as in quantitative research), with a focus on the issues to be covered. Questions about each issue were asked in an open-ended manner and at a time when it seemed to fit with each participant's narrative (Tutty et al., 1996).

The researcher used questions in the interview which sought narrative life-history discussions on the adaptation to droughts. The interview guide had three main sections. These were the introductory, interview and conclusion stages. The study used a voice recorder to record the participants' perspectives on situations in order to retrieve and clarify the information given during data analysis. The interviews were conducted in Oshiwambo. Interviews took

approximately 45 minutes each in length and they were conducted face-to-face at each participant's house. Permission to voice-record each interview was sought from each participant.

To gain better insight into the subject under study, key informants' interviews which were combined with the focus groups were also conducted. During the key informants' interviews, twenty two key informants were identified and interviewed with regards to their knowledge and experiences of droughts. The researcher used probing open-ended questions in order to get maximum amount of data and information to help in clarifying the information collected. Data collected included indigenous and conventional knowledge of droughts adaptation techniques employed by farmers, farmers' preparedness techniques to cope with droughts and households' adaptation techniques. The key informants' interviews were also conducted in Oshiwambo.

The researcher also used the following technique for key informants' discussions:

• The researcher maintained eye contact with the participants. The researcher maintained eye conduct with the participants to indicate that she was focused and paying attention to what they were saying.

• The researcher used grand as well as mini tour questions to elicit information from participants. Grand tour questions were broad questions asked to introduce the topic such as "What do you know about the 2013, 2014, 2015, 2016 droughts?" The mini tour questions were specific questions such as "What social structures help the community to cope and adapt the droughts?"

• The interview techniques of probing (verbal and non-verbal) were used. These included probing or "exploring", silence, prompting as well as summarising. The researcher used phrases such as "Could you elaborate more on that point?" and also maintained eye contact to encourage

participants to continue speaking. The researcher summarised the last statements of the participants and encouraged more talk (Holloway & Wheeler, 2002).

• The researcher used a semi-structured interview, but the line of questioning and responses from participants maintained flexibility and consistency.

• The researcher asked if there were more questions or comments. This assisted with the closure of the interview. The researcher summarised the interview proceedings by restating in her own words the ideas and opinions of the participants, to ensure reciprocal understanding. The participants were told of the need for follow-up interviews should there be any aspects that were not clear.

During the interviews the researcher had to record the interview and then later filled in the interview guide herself, because the interview guide was written in English while the interviews were done in Oshiwambo.

The researcher took notes but made sure that the non-verbal behaviour of the participants as well as the researcher's reactions were maintained and comments could be recorded (Holloway & Wheeler, 2002).

• This method of collecting data acts as a back-up of the information obtained on the audio-tape.

Note taking was done discreetly to avoid distracting the participants. Note taking was written down after the individual interviews. Field notes during the interviews were limited to avoid interrupting the interview session (Rubbin & Babbie, 2011; Yin, 2010, p. 67). These notes were read back to the participants to make sure that they were well understood.

The following factors were considered by the researcher to ensure a successful interview while using a voice recorder:

• Permission to use the voice recorder was sought before the interview. All the participants consented to its use.

• Use of the voice recorder enabled the researcher to maintain eye contact with the participants. Preservation of participants' words during data collection is very important. The following tips enabled the success of the interview:

• The voice recorder was positioned close enough between the researcher and participants to record the conversation.

• The voice recorder was tested prior to the interview to ensure that it was in good working order.

3.6. Data analysis

Data analysis means to organise, provide structure and elicit meaning to the data. Analysis of qualitative data is an active and interactive process (Polit et al., 2001). Data analysis commenced after conducting the first interview.

Once the data collected becomes repetitive, and a point of data saturation (De Vos et al., 1998) is reached, then the process of data collection can be concluded. The voice-recorded interviews were transcribed in Oshiwambo and thereafter translated into English. A translator checked the translated transcripts. Hereafter, and for the purpose of this study, the researcher followed the eight steps as proposed by Tesch (Creswell, 2014) to analyse data. This entails the following: The researcher gets a sense of the whole by reading all the transcripts carefully, jotting down

along the margin some ideas as they come to mind in connection with each topic. Choosing the transcript on top of the pile of the transcribed interviews, the researcher reads through the transcript, asking herself what it is that she is reading. This step involved thinking about the underlying meaning, rather than the "substance" of information. This process was repeated until a list of all the topics was acquired. The topics were then clustered together into baskets that were labelled as "major topics", "unique topics" and "left-over". With the list at hand, the data was revisited. An abbreviation for each of the topics was made in the form of codes and the codes were written next to the appropriate segments of the texts. This preliminary organising scheme was used to see if new categories and codes emerged. The researcher found the most descriptive wording for the topics and turned them into categories. Efforts were made to reduce the total list of categories by grouping together topics that related to one another. Lines were drawn between categories to show interrelationships. The researcher then made a final decision on the abbreviation for each category and alphabetised the codes. The data material belonging to each category was assembled in one place.

In this study, meanings were formulated from extracted statements and then clustered into themes to provide full meaning of the experience. The participants were consulted to ensure or confirm the credibility of the description.

4. Research ethics

Conducting of research requires not only expertise and diligence, but also honesty and integrity. There were ethical considerations that the researcher strived for during the data collection process and analysis of the data. This is done to recognise and protect the rights of human subjects. As outlined by Neuman (2006) the ethical consideration used were as follow: To render the study ethical, the rights to self-determination, anonymity, confidentiality and informed

consent were observed. Respondents' consent was requested before the voice recorder was used. The respondents were well informed that their names would not be published, thus the researcher gave the respondents a choice to either give their names or to remain anonymous. The researcher has changed the names of the participants in all documents related to the research. The privacy and anonymity are thus important in keeping them secure after the completion of this research. Interviews were not referenced as the participants did not give permission to reveal them as sources in accordance with the APA standards. All participants gave their consent after being informed about the study and what it was about. All the participants fount the research important and gave open and honest answers regarding the questions posed to them.

It is important to obtain a person's informed consent before the researcher involves him or her in a research study. The key word here is "informed". The participant must understand what is going to happen during the study, why it is going to happen, how long it will take and what the risks and benefits will be for him or her before he or she can consent. The researcher explained to the respondents the objectives of the research, as well as to how many questions she was going to ask the respondents. The researcher also provided the potential participants with the questions to be asked. Furthermore, she asked permission to use the voice recorder during the interviews. The researcher also informed the participants about who will have access to the voice recordings and the transcripts of the voice recorded interviews, (i.e. the researcher, the person who will be checking the translations of the transcripts from Oshiwambo to English as well as the independent coder and the study's supervisor). The researcher has ensured that the process of data collection has not harmed the participants as a result of the research. All data collected was given willingly and freely by all participants and none of the data has harmed them or their relationships.

Written permission to conduct the research study was obtained from the University of Namibia's Research and Ethics Committee. Verbal permission was obtained from the Olukonda constituency councillor in Oshikoto region, Namibia. Participants' consent was obtained before the interviews were conducted. Burns and Grove (1993) define informed consent as the prospective respondents' agreement to participate voluntarily in a study, which is reached after assimilation of essential information about the study. The participants were informed of their rights to voluntarily consent or decline to participate, and to withdraw participation at any time without penalty. Participants were informed about the purpose of the study, the procedures that would be used to collect the data, and they were assured that there were no potential risks or costs involved. Anonymity and confidentiality were maintained throughout the study. Burns and Grove (1993) define anonymity as when subjects cannot be linked, even by the researcher, with his or her individual responses. In this study anonymity was ensured by informing the participants that even though their names were written on the questionnaires, their names would not appear anywhere in the study. The names were written down so that the researcher could recall the households where the interview took place in case the researcher needed to return to the household to get clarity during data analysis

When participants are promised confidentiality, it means that the information they provide will not be publicly reported in a way which identifies them (Polit & Hungler, 1995). In this study, confidentiality was maintained by keeping the collected data confidential and not revealing the subjects' identities when reporting or publishing the study (Burns & Grove, 1993). No identification information was entered onto the interview guide, and the interview guides were only numbered after data was collected (Polit & Hungler, 1995).

The ethical principle of self-determination was also maintained. Participants were treated as autonomous agents by informing them about the study and allowing them to voluntarily choose to participate or not. Lastly, information was provided about the researcher in the event of further questions or complaints. Scientific honesty is regarded as a very important ethical responsibility when conducting research. Dishonest conduct includes manipulation of design and methods, and retention or manipulation of data (Brink, 1996). The researcher tried to avoid any form of dishonesty by truthfully recording the answers of those subjects who could not read or write. The open-ended questions which were used by the researcher were also checked by the supervisor for confirmation of credibility.

The researcher has strived for accuracy in the use of the research methodological standards. The researcher has adhere to the use of all data collection instruments and data analysis so as to provide accurate results of the study conducted.

The researcher adhered to all ethical considerations in accordance with the ethical certificate received from the University of Namibia, and thus followed all ethical guidelines. No ethical boundary was crossed in the field of study thus all findings are presented with a clear ethical consciousness. The integrity of the findings and the anonymity of the participants are preserved both during and after the completion of this study.

5. Conclusion

The researcher used a qualitative, explorative and, descriptive survey design. Two interview guides were administered by the researcher herself to collect the data from a purposive and non-probability sample of 15 participants. The primary data collection method used in this study was one-on-one in-depth face-to-face, semi-structured interviews. The sample characteristics

included adults who were impacted by droughts and their modes of adaptation were explored. Permission was obtained from the Olukonda constituency councillor. Consent was also obtained from the participants themselves. Anonymity, self-determination and confidentiality were ensured during the administration of the interview guides and report writing. The interview guides were administered by the researcher herself to ensure validity. Reliability and validity were further increased by pre-testing the interview guides. This chapter also described the research methodology, including the population, sample, data collection instruments as well as strategies used to ensure the ethical standards, reliability and validity of the study.

CHAPTER FOUR

FINDINGS AND DISCUSSIONS

4.1 Introduction

In this chapter, the findings of the study are presented based on the final major themes identified as categories with supporting literature. The focus was on the farmers' gendered modes of adaption and coping strategies to droughts and how these modes of adaptation can lead to gender inequality. The data analysis provided meaningful insights about the experiences and presentations on the emerging themes found in the raw data.

The following themes or categories emerged: farmers experiences on droughts, the modes of adaptation to droughts by men and women, how the modes of adaptation relate to issues of gender differences, the views of men and women on gender roles, gender differences to adaptation could be changed, as well as the extent of awareness of gender empowerment and equality issues within households.

4.2 Brief overview of the farmers' demographic information

Table1. Respondents' demographics

Table offers basic demographic information for each participant. Pseudonyms are used to maintain participants' anonymity, sex, age and how long the participants have lived in Olukonda constituency. Finally the researcher included the number of years the participants have experienced droughts.

*** The names reflected are Pseudonyms***

Name	Sex	Age(years)	Number of years lived in Olukonda	Number of years experienced droughts	Nationality
Johannes	**F**	**48**	**48**	**5**	**Namibian**
Lucia	**F**	**61**	**61**	**4 years**	**Namibian**
Maria	**F**	**48 years**	**5 years**	**1 year**	**Namibian**
Frieda	**F**	**59 years**	**20 years**	**4 years**	**Namibian**
Linda	**F**	**35 years**	**35 years**	**3 years**	**Namibian**
Iyambo	**M**	**46 years**	**46 years**	**4 years**	**Namibian**
Jonas	**M**	**39 years**	**39 years**	**4 years**	**Namibian**
Luucina	**F**	**20 years**	**20 years**	**2 years**	**Namibian**
Tresia	**F**	**19 years**	**19 years**	**2 years**	**Namibian**
Taati	**F**	**67 years**	**67 years**	**4 years**	**Namibian**
Ester	**F**	**66 years**	**66 years**	**4 years**	**Namibian**
Nujoma	**M**	**51 years**	**7 years**	**3 years**	**Namibian**
Beata	**F**	**48 years**	**7 years**	**4 years**	**Namibian**
Ndaafa	**F**	**49 years**	**47 years**	**5 years**	**Namibian**

Aune	**F**	**57 years**	**27 years**	**5 years**	**Namibian**
Eino	**M**	**42 years**	**42 years**	**5 years**	**Namibian**

4.2.2. Gender of the farmers

Considering the gender of the farmers is important in determining the different modes of adaptation employed by men and women in times of droughts. It also gives an indication as to how many men and women are affected by the droughts and how they have coped and adapted to the droughts effects.

Farmers were asked to indicate their gender by selecting the relevant option provided (male or female), and all the 15 farmers responded. Of the 15 farmers interviewed, 12 were females and 3 were males. This could be attributed to the fact that men migrated out of the constituency in search of either grazing areas for their animals or for employment.

4.2.3. Age

According to the demographic information, the age range of farmers was between 19 to 67 years. The figures above indicate that the majority of the respondents fell within the 41- 50 years age group. This shows that the respondents were within the age group of people who would consider farming as very important, and this therefore justifies the reasons for them to be affected by the droughts**.**

4.2.4. Number of years lived in Olukonda constituency

The majority of the farmers lived in Olukonda constituency most of their lives as the farmers indicated that they have lived in Olukonda from 5 to 7 years. It is evident that the majority of the respondents were females, and this can be attributed to the fact that men migrated out of the constituency in search of either grazing areas for their animals or for employment. The information in the table also shows that all the respondents interviewed were Namibians. This shows that the villages in Olukonda constituency are occupied by mostly Namibians who are Oshiwambo speaking.

Findings from the study revealed that the majority of the respondents have experienced droughts for 4 to 5 years. This can be attributed to the fact that the researcher asked her questions based on the four years (2013/ 2014, 2013/2014, 2014/2015 and 2015/ 2016) drought seasons.

4.3 Presentation of findings

To report on the research findings, the researcher presents transcribed quotations of the farmers in Olukonda constituency from the interview to support the farmers' adaptation strategies to droughts. The contents of the quotations guided the researcher towards the results inferred from the data and established the credibility of the themes by ensuring that the illustrative quotations reflect the farmers' meaning and feelings. The researcher's interpretation and analysis are integrated with literature, which serves as evidence of the themes and sub-themes (Hooloway & Wheeler, 2003).

The collected data from the semi-structured individual interviews, the process of data analysis by the researcher as well as the discussion, resulted in themes supported by sub-themes which are presented in table 2.

4.3.1 Table 2: Themes and sub-themes

Themes	**Sub-themes**
Strategies used by men and women to adapt to droughts	
How adaptation relates to issues of gender	Sub-theme 3.1: adaptation strategies used by women Sub- theme 3.2: adaptation strategies used by men
Views of men and women on gendered adaptation	
Gender roles	Sub-theme 5.1: labour activities by men and women
Strategies for men and women to adapt the same	
Changes in adaptation strategies	
Adaptation challenges	
Awareness of gender empowerment and equality in the families	

4.4. Theme 2. How farmers understand droughts

Drought is often one of the most devastating but least understood weather phenomena, largely because of its slow onset and its accumulating impacts over time. Although definitions vary depending on the context, drought is a period of several months or even years of abnormal dryness due to below-average rainfall that causes a pronounced decrease in forage yield relative to what is expected in an average year. Associated with the below normal forage production are crop failures, livestock losses and severe socio-economic disruptions to humans (Wilhite, 2000; Downingand Bakker, 2000; Whetherald and Manabe, 2002).

The study probed awareness of drought and local perception of changes in rainfall patterns. Therefore, farmers were assessed on their knowledge of drought. There was a general perception that Olukonda and the whole of Oshikoto region have become drier over the years. When men and woman attempted to describe drought, their understanding of drought were linked with a lack of rain and hunger. Participants indicated that drought is associated with a lack of rain which resulted in a lack of harvesting and loss of livestock. "*The current (2016) drought was really bad, we did not receive any rain" stated a 48 years woman from Okaloko village."*

"I have never experienced drought like the current (2016) drought" stated a 47 years men from Okaloko village ".

In key informants' group discussion, farmers indicated that drought is associated with rainfall patterns that have changed both in duration and in season. Farmers have observed that the rain came very late and stopped too early. Farmers have indicated that the start of rain fall season has shifted from September/October to December/January and end of season has shifted from April/May to February/March. Farmers also indicated that the duration of rainfall has also been

shortened from 7 month to 3 months. This in line with how Wilhite, 2000; Downing and Bakker, 2000; Whetherald and Manabe, 2002, has described drought to be a period of several months or even years of abnormal dryness due to below-average rainfall that causes a pronounced decrease in for age yield relative to what is expected in an average year.

The low rain fall leads to insufficient water for both domestic and agricultural purposes causing farmers to rely on tap water provided in the community. The researcher has observed that, when farmers were asked to describe the drought they began talking about drought relief food that they normally receive from the government. This might be due to the fact that, when there is research done in the area it is mostly related to drought relief food.

4.5. Theme 3: Strategies used by men and women to adapt to droughts

The first major theme that emerged was labelled as adaptation strategies to droughts. Contained within this theme are the men and women's coping and adaptation strategies to droughts within Olukonda constituency. The data in this theme were divided in-to two sub-themes. The first sub-theme is the adaptation strategies used by women. This sub-theme includes a discussion of the adaptation strategies used by women in order to cope with the droughts. The second sub-theme is the adaptation strategies used by men.

This sub-theme contains data on how men adapted to droughts. In order to adapt to drought effects, various adaption strategies were practiced by farmers which were based on limited resources available at the household level as well as help from external sources.

The farmers in Olukonda constituency indicated that their main mode of adaptation is the drought relief food which is distributed by the government in times of droughts. The distribution is done through the local authorities such as the constituency councillor's office and

through the village head men/women. The farmers have also indicated that they buy *mahangu* from other regions especially from Ohangwena region which is close to Angola. The participants indicated that they buy the *mahangu* grains using their salaries or through getting financial assistance from their children or from extended family members. The respondents also indicated that the prices for the *mahangu* grains have increased drastically because of the droughts. Moreover, the farmers indicated that they had to travel long distances to buy the *mahangu* grains, and they further pointed out that they had to travel to other regions such as Ohangwena or to the neighbouring countries such as Angola.

"To tell you the truth people cope only with the assistance from the government" key informants.

"As a pensioner I use my pension money to cope with the droughts" key informants.

Besides receiving drought relief food distributed by the local authorities, the farmers in Olukonda constituency have employed various coping mechanisms such as buying, weaving baskets and selling their livestock. As girls growing up in the village they are expected to know how to weave baskets. Most of the women in Olukonda indicated that they were taught by their mothers how to weave baskets. Women are expected to learn how to weave baskets in order for them to be able to use the baskets to collect the *mahangu* grains from the *mahangu* field. The baskets are weaved using palm tree leaves, which are dried and then put in hot water to make the leaves soft. The palm trees grow in their yards, thus the women do not need to buy them. These findings oppose the findings by Angula (2012), from Oshana region which indicated that both men and women from Epyaeshona village in Oshana region reported that the government provides drought relief food and that local people rely too much on government relief and they are not attempting other means or mechanisms to their adaptive capacities. These could be

attributed by the fact that Angula's research was focusing on adaptation to climate change and not specifically on adaptation to droughts.

"As women we weave baskets and go around the village to either sell or for people who have food can put in something in the baskets"39 year women from Olukonda village.

"Men who owns cattle can kill them and buy or maize meal for the household"39 year women from Olukonda village.

"Our government is taking care of use by giving us drought relief food "a 48 year old man from Okaloko A village.

According to Angula (2012), men and women have been coping and adapting to the effects of drought and other climate related variabilities for years. While, The Intergovernmental Panel on Climate Change reports (IPCC, 2001, 2007, 2012) define adaptation as an adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Adaptation therefore involves adjustments in reducing the vulnerability of households to climatic variability and change (Adger et al., 2007).

The study found that farmers did not prepare for the 2013/ 2014, 2013/2014, 2014/2015 and 2015/ 2016 droughts before their onset. Although warning systems are available for drought prediction, the findings show that the needed information about hazards such as the 2013/ 2014, 2013/2014, 2014/2015 and 2015/ 2016 droughts is not adequately managed by the concerned authorities. This was also reported in a study done by Olaleye (2010), who argued that farmers and other stake-holders in the agricultural sector have to be kept abreast with information about early warning systems so that adequate coping or adaptation strategies can be formulated to

reduce farmers' vulnerability to drought. In Namibia, early warning services are available. In the early days of weather forecasting, fortune telling was probably a more accurate predictor of drought than meteorology. But lately, due to the severe economic implications of abnormal weather around the globe, weather scientists are able to predict abnormal weather patterns quite accurately. These days, the farmer who ignores a medium- to long-term weather forecast does so at his/her own risk (Rothauge, 2010). Farmers in Olukonda constituency indicated that the weather reports are always reported on the radio and drought predictions are also announced on the radio and in the local newspapers.

Farmers indicated that in the past, farmers could gather wild fruits or hunt wild animals to supplement available food. However, the study area no longer has forests, and as such, farmers cannot seek wild fruits. Also considering the government's stance on gaming, it would not be expected for farmers to kill wild animals as they please. The Namibian government has put up frameworks such as the Controlled Wildlife Products and Trade Act, 2008 (Act No. 9 of 2008). The Act points out that any person who possesses any controlled wildlife product will be contravening the law in terms of Schedule 1 of the said Act. Manufactures of anything from a controlled wildlife product if such manufacture is unlawful in terms of Schedule 1; imports any controlled wildlife product if the import thereof is unlawful in terms of Schedule 1; or exports any controlled wildlife product if the export thereof is unlawful in terms of Schedule 1, commits an offence unless he or she has been issued with a permit contemplated in subsection (3) authorising the act in question and unless he or she complies with the conditions specified in the permit. A person who has contravened the subsection of the said law: if he or she has only possessed the product as contemplated in subsection (1)(a), on conviction liable to a fine not

exceeding N$20 000 or imprisonment for a period not exceeding five years or to both such fine and such imprisonment.

The Namibian government has also introduced the bottom-up approach which recognizes the importance of providing tangible conservation incentives to the people who live alongside dangerous wild animals: rural communities and private landowners. The government has built strong market-oriented institutions such as the Communal Wildlife Conservancies which allow people living near wild animals to receive direct economic benefits from the wildlife. The Nature Conservation Amendment Act (Act 5 of 1996) makes provisions for the establishment of communal and commercial conservancies. This provided the basis for the creation of Namibia's Community-Based Natural Resources Management (CBNRM). Such institutions encourage locals to view wild species as assets worthy of their custodianship and investment.

Thus, farmers indicated during the key informants' group discussions that they had to learn to eat food that is foreign to them such as macaroni, rice, and maize meal which they buy from the shops. *Mahangu* porridge and milk are the basic ingredients of the staple diet but a diversity of other greens and herbs are adding spice and also now and then a goat and a pig are slaughtered and fowls are eaten as well as fish when the *efundja* (flood) comes from Angola or the perennial streams are in the vicinity. But noodles and other pasta such as macaroni and spaghetti as well as rice are consumed more and more, whereby pasta is produced in Namibia while rice is imported and is not grown in Namibia. This is in line with what Olalye (2010) found in South Africa, that farmers sought new sources of food during the drought periods, by purchasing cheaper brands of food than what they normally eat or buy from stores. White maize on the other hand is the major commercial crop produced in Namibia and its harvesting fluctuates with the rainfall conditions. Maize is planted either under dry land, irrigation based methods or both.

Dry-land white maize is mainly produced in the maize triangle situated between Grootfontein, Otavi and Tsumeb, in the summers down, Omaheke, and the Caprivi Region.

"We never used to eat macaroni, rice or even buy them but because of drought we have to learn how to eat this food which is foreign to us" key informant.

"I came up with a strategy were I missed mahangu and maize meal together so that I can have more mahangu meal for the family" a 61 years old women from Okalolko A village

Farmers from the key informants also revealed that earning a salary helped them to cope better in times of poor crop yields. A man from this group reported that he regards formal employment either in the government or non-formal employment such as doing casual work as the main source of livelihood during drought seasons. Farmers indicated that they spend their money on buying supplementary feeds from the commercial farmers who are selling dry grass for their animals. The supplements can also be bought from the neighbours or from other constituencies or regions. The male farmers indicated that they were not aware of the impending droughts, thus they were not fully prepared for the drought impacts. The male farmers indicated that because they were not prepared for the droughts they could not store food for their livestock, which caused them to spend money on buying food for their livestock from the farmers that were better prepared for the droughts even though they were affected by the drought themselves. This was done as a coping mechanism exhibited by farmers to ensure the sustainability of animals during the periods of water and grass shortage.

"Men are responsible to look after the cattle, we buy medicine, supplements for our cattle, we buy dry grass from the farm owners who have stored some grass, we mostly have to drive long distances in search of grass for our livestock" a 48 year old men from Olukonda village. We have to use the little money that we get from our salaries or our pension money"

Farmers indicated that they participate in economic activities such as shebeens selling home brewed liquor, bars/stores, selling of natural products such as wild fruits which are done mostly by women, wood carving mostly by men, basketry, traditional brew, brick-making and domestic work. A market for selling the products exists some 20 km from Olukonda village where men and women can sell local products. The female farmers indicated that they are mostly responsible for buying food items with the money which they make from the shebeens to try and provide food for the household, while the men would concentrate on making money to try to rescue their livestock.

"I at least try to open a small business; I have a shebeen at the local cuca shops. I sell cool drinks and beer so that I can cope with the drought and the lack of food" a 59 year old woman from Okaloko B.

Another woman narrated that "Besides the drought we have children who are going to school. We have to try and make money by selling agricultural products or traditional brews such as marula brew", a 35 year old woman from Okaloko A.

"A lot of animals died as a result of droughts and the curcuses are left in the field because nobody can eat the meat, my husband decided to collect the dead animals skin and makes leather belts and sell them in order to help me with food for the family", a 59 year old woman from Okaloko B.

4.6 How adaptation relates to issues of gender

4.6.1. Sub theme 4: Adaptation strategies used by women

Most of the participants interviewed had similar responses in terms of how they adapt to droughts. Women indicated that they adapted by weaving baskets which they make out of dried leaves from the palm trees and they process marula nuts into oil. Marula nuts are processed into oil which can be used for coking, and they also sell their chickens, pigs or sell traditional food items like *mopani* worms and dried spinach to raise money to buy food for their families.

Women also indicated that the processing and selling of marula nuts have assisted them to cope with the effects of drought. Women indicated that having the marula tree on your property helps a lot. The marula tree is widely distributed in sub-Saharan tropical Africa; it is drought resistant and it is most common in open woodlands. The fruit is about the size of a plum, with a leathery skin that is butter yellow when ripe. In Namibia, this multipurpose tree is found mainly in the northern parts of the country. It has a long history of traditional use, especially in north-central Namibia. The importance of marula extends from social to cultural, economic, and nutritional aspects of people's lives. From the shade of the tree to the use of the empty nutshells for firewood, marula is extensively used and its uses include as food, drinks and medicine. In north-central Namibia, women are, without doubt, the custodians of the marula resource. Although marula products are appreciated by men and women alike, it is the women who own the trees, gather the fruits, and produce the wine, juice and oil.

In north-central Namibia, marula trees generally fruit between January and April/May, with the bulk of fruit being available in February and March. During the fruiting season, women usually

gather under the trees to make *omaongo* (marula wine). Making *omaongo* is a social event. Women invite their female friends and neighbours once the fruits have ripened and fallen to the ground. They gather under the tree to process the marula fruits while socialising, singing and joking. Typically, they use a cow horn to puncture the leathery skin of the fruit. The juice is squeezed out into a bucket or clay pot, and the remaining seed and flesh goes into another container. The juice is then simply left to ferment. In most areas, the fermenting juice remains with the owner of the tree, but each woman takes home some seeds with the remaining flesh and skin. Water is added to these to make *oshiwa*, a traditional non-alcoholic juice that is consumed mostly by children. After this, the seeds or kernels are left to dry.

The marula kernels (*omahuku*) are extracted after the seeds have dried for a few months, during the time when people are less busy in their fields, typically from June/July until the end of the year, depending on when the rain starts. To extract the kernels, the women first cut off the 'head' of the nut by placing the nut on an upturned axe and hitting it with a piece of wood. They then use a flattened needle for taking out the kernels, which are then used to make the traditional condiment oil (*ondjove*), or sold in informal markets for the production of cold-pressed marula oil. The processing and selling of marula kernels is thus done solely by women, and the money received for the kernels is also controlled exclusively by them.

Women were also the first to diversify their livelihoods through basketry, processing nuts and oil, or through sales of their livestock such as chickens, pigs, or goats to raise money to buy food. Because women are the main providers of food and meals for their families, women bear a greater burden to fulfil this task when climate events occur (Jungehülsing, 2010). Angula (2012) found that in Namibia during droughts, out of their submissiveness to

their husbands, women first explore other means of ensuring food security before discussing the matters of food shortage with their husbands.

"Ohandi tungu ngaa iimbale ete landitha opo ndihuputhe aanona yandje" ("I must weave baskets as a single parent and sell in exchange for food for my children") a 45 year old woman from Olukonda village.

Farmers affected by droughts received help during normal times, and during droughts but some farmers were not fortunate to receive such help. Farmers indicated that they at times had to rely on the neighbours for assistance as a coping mechanism. Such help as claimed by the farmers were in the form of food items from neighbours or friends. The farmers indicated that even though the whole village was affected by the droughts some households were in a position to help others because they had family members who are employed by the government. The famers indicated that the neighbours or friends were able to help them because they have either stored some grains or they could afford to buy *mahangu* grains. The farmers claimed that women had to do the begging because it is easy for women to help each other compared to men.

"It is very difficult to accept drought and hunger, but in Oshiwambo we say if you have, you have to give to the ones who don't have", stated a 56 year old men from Okaloko village.

Discussions also revealed that both male and female farmers in Olukonda constituency relied on their salaries in order to cope with the impacts of droughts. Households with family members who are employed either in the government or private sector revealed that salaries or the monthly income is their main source of livelihood during droughts. During the key informants' discussions, the farmers indicated that the presence of an employed household member or receiving remittances from relatives improves household food security. The farmers indicated

that in order to balance their employment away from their farms, they have to employ someone to work in their fields while they are at work. "*Ngame gwepo ngaa, shashi ondina aanona hayalongo". "I am coping better because I have children who are employed; they help me to pay for my water bill and to buy food for the household", a 66 year old women from Olukonda village.*

Government social welfare schemes such as child and old age grants provide safety nets for farmers to cope with droughts. Women also indicated that they use their social grants (pension grants, disability grants and vulnerable children's grants). The farmers indicated that the social grants are not enough to maintain their household but they appreciate the government's effort. The farmers indicated that they receive N$1000.00 for the pension and disability grants, and N$250.00 for each child that qualifies for the grant. Farmers also indicated that they receive the grants at the end of each month, through the bank or through Nampost or some pensioners have to receive their money as cash at the cash pay points. Farmers also indicated that queuing up to receive their pension money at times consumes a lot of their time which they could spend on weaving their baskets.

"*Our government is taking care of us by giving us drought relief food and pension money"*

"I use my pension money to buy or maize meal for my family"

During the key informants' discussions, women indicated that they have to reduce the number of times they eat or cook per day (cooking only dinner). In Burkina Faso, Roncoli, Ingram, and Kirshen (2001) found that heads of households (gender not explicitly stated) take diverse measures to cope with food shortages due to severe droughts. These include reducing the number of women cooking and charging one woman to cook a common meal rather than

allowing each woman to cook separately, supervising women more strictly in how they handle grain for cooking, using a smaller container to measure grain or extending the time between grain allocations to women, and relying on women's contributions of grain from their own fields or bought with their own money. In the present study this was expressed: *"We had to change the number of times we eat per day; we also learn to reduce the portion of food we serve. We only eat two times per day for example we only eat breakfast and dinner or lunch and dinner only" key informant.*

Based on the above findings, it is clear that the way in which individuals, groups of people, and communities interact with their natural environment are different. It is also clear that droughts do not affect men and women in the same way.

4.6.2. Sub theme 5: Adaptation strategies by men

It was observed that the male farmers' adapted by selling their livestock: this was done mainly to reduce the effects being suffered as a result of droughts. All the farmers in Olukonda constituency operated on communal land, which does not give them ownership to such land, as a result, land could not be sold or pledged, and most of the farmers also lacked adequate farming equipment such as tractors. The only form of assets available to them was livestock which they bought or inherited from their parents. Farmers had to sell their livestock at a giveaway price considering the situation at hand. There are also farmers who claimed not to have sold livestock and these are the farmers who did not have animals. The farmers indicated that they had to sell their livestock because the livestock were dying of hunger and thirst. They indicated that it was better to sell the animals instead of watching them dying.

However, male farmers also adapted to droughts mainly by buying *mahangu* from other farmers in the other regions that had received good rain in order to feed their families. The farmers have

indicated that they bought the *mahangu* grains from regions such as Ohangwena region which had received better rain. The farmers indicated that even though farmers in Ohangwena were also affected by the drought, they are close to Angola and they are able to buy *mahangu* grains from Angola and resell them to the other farmers who are far from Angola.

Men indicated that they at times cut wood and sell but this has become difficult because there are no longer trees in their community. The lack of trees could be attributed to the fact that the Oshiwambo homesteads are fenced around by timber. In the past farmers had to cut down trees in order for them to either build their houses or crawls for their livestock. The lack of trees could also be attributed to the farmers who cut down the trees and did not replant the trees. Cutting of trees is currently prohibited in Namibia and it is regulated by the Forest Amendment Act 13 of 2005. In Namibia as a general rule, all trees and plants/vegetation within 100 metres of a watercourse (e.g. a river) are protected. They may not be cut or destroyed without a license issued by a Licensing Officer. The license may require the holder to take certain action such as planting trees. Even though there are no rivers in Olukonda constituency, this rule applies to them as well. *"Cutting of wood has become difficult, if the government (Ministry of Agriculture) finds you cutting wood you will be in trouble, especially if you do not have a license to do so", said a 39 year old men from Okandiina village.*

Men indicated that they migrate out of the constituency or region to other regions in search of grazing areas for their livestock. The findings about the migration of farmers for better grazing for their livestock concur with the work done by Agwu and Okhimambe (2009) that found that in Nigeria during dry seasons, temporary migration of men to urban areas results in women being left alone to take care of the household.

In Namibia, migration of men out of villages started in the late 19th and early 20th century and this was called the contract labour system. The contract labour system was a system in which labourers were recruited to work in the central and southern part of Namibia usually for six to eighteen months. Under this system, any men above the age of sixteen years and mature enough to work and without any disabilities could be recruited. Once recruited, the labourer had no right to decide the type of employment or to negotiate the salary. The recruiting agency effectively sold the contract labourers to various employers and the labourers were expected not to break the contract (Bhagavan, 1986). Emmett (1999) argues that "while drought and famine helped to lay the foundations of the migrant labour system in Namibia, colonial policies reshaped these ecological responses into a comprehensive system of labour control and exploitation." In Ovambo, one impact of the contract labour system was the loss of male labour to agriculture as women were left alone to deal with family activities which included the care of domestic animals and subsistence farming (Hishongwa, 1992).

Women may engage in petty trading to supplement income from the men. This is also supported by Bradshaw (2004), who found-following a disaster as has been the tendency worldwide, many male heads of households migrate resulting in an increase in the number of female headed households. This could also be observed during data collection for this study, as most farmers interviewed were women. Men send money to their wives for the household use. The sending of money back home is referred to as remittances. Remittances are defined as the portions of cross-border earnings that migrants send home (Mutume, 2005). Before independence, migrants used informal transfer systems either to remit funds to rural areas and regions that are underserved by formal financial institutions, or to send remittances in kind (such as groceries), which money transfer enterprises cannot do. Some contract labourers,

especially those who worked in towns, sent money home to their families through friends. As such the celebration of the return of contract labourers was not only an appreciation of the contract labourers' safe return but it was an expression of appreciation of the few goods that were brought for them. Some contract labourers purchased goods like "katishu" (a small gun for shooting birds) (Shampapi, 2009). Others bought metal ploughs (Karenga, 2009) but in independent Namibia man can send money back to their families through the banks or Nampost.

"Majority of men have moved or migrated to ohambos (cattle posts) or to other constituencies even out of the country to Angola in search of better grass for their cattle" key informant.

During the discussions it emerged that in the absence of men, women are mainly responsible for weeding the crop fields. These may include paying for the tractors to plough the field and paying for additional people to help the women to plough the *mahangu* field. Therefore men are also expected to cope and develop adaptation strategies to deal with the reduction in land productivity. Farmers indicated that they did not change their cropping system and they did not try to change the type of seeds they used in order to adapt to the droughts. Some farmers had stored food not because they were prepared for the droughts but because they had the habit of saving for the dry days. It was observed that most of the farmers did not have storage facilities, which led to the lack of storage of food or *mahangu* grains. Traditionally men are responsible for weaving the larger granary baskets for the *mahangu* storage. The granary baskets can either be used for the household food storage or it can be sold in order to earn an income. In the absence of granary storages, farmers mostly produced just enough crops to sustain them for a certain period or until the next rainy season. The man had to provide water for his family by digging wells, and he had to plough the field for cultivation together with the women. When the family

needs *mahangu* it is the man's responsibility to give out *mahangu* from the granary for the woman to cook it.

4.7. Views of men and women on gendered adaptation

This study illustrated that traditional gender based roles still persist. Traditionally, women are responsible for fruit harvesting and weaving baskets. Men mostly engage in livestock farming related activities.

This study also revealed that there might be changes in gender relations in the rural areas due to equal opportunities which were made possible by laws that were put in place to protect both men and women such as the Married Person's Equality Act of 1999, which was established to abolish marital powers, which was promulgated by the government of Namibia to women and men. The root causes of gender inequality have been the low status of women and girls and the negative cultural perceptions of gender roles which are practiced in times of droughts adaptation as well.

Key informants reported that women are becoming more involved in decision making and that they are more empowered than in the past (before independence).

"Women have power to make decisions both at work and at home, unlike in the past when women could not make decisions. The only person who had the author to make decisions was the owner of the house, who is the husband", 61 year old from Okaloko A village

"Women could only make decisions when it comes to children", a 48 year old women from

"*In fact our constituency councillor is a woman"* (Chairperson of the CDC).

Even though the key informants indicated that women are involved in decision making and are empowered, the study revealed that there is a feeling of dissatisfaction among women in the study area. Women reported that some of the men are not supportive of their wives or households because they spend most of their time at *shebeens* abusing alcohol, or they leave their families in search of work and never return or never send money to maintain the household. This finding are in line with Julie Webb (2012) in Niger who discovered that, a changing climate can require women and men to take on different roles and responsibilities; and adaptation interventions can do the same. Impacts on household livelihoods, asset base, human and animal health and intra household relations are driving some households and communities to change their lifestyles and roles, and these changes have different impacts on women and men. Coping strategies that used to help communities manage an already unpredictable climate are becoming unviable.

"To tell you the truth, men do not perform their duties at home because they are just at the shebeens drinking Tombo" a 59 year old woman from Okaloko A village.

There is also a trend among some Oshiwambo ethnic groups whereby men are neglecting their duties as heads of households. Instances on equal distribution of power between women and men are causing gender relations to worsen, much to the disadvantage of women (Angula, 2010). This could also be caused by attitudes arising from long held beliefs that women are weak and they should be looked after.

"Some men will leave looking for work but then they never return or send money home for the household maintenance", 39 year old women from Okandiina village.

Most rural women depend on their husbands to give them money or to send money to them from the urban areas. Therefore, women face continued dependence on men for money which contributes to maintaining their lower social status vis-à-vis men, and places them at risk of poverty, exploitation, and gender-based violence (Ambunda and de Klerk 2008.

"I am unemployed; the only income I have is my husband pension" a 57 year old women from Okandiina village.

"I am uneducated; I did not attend any formal school. I depend on my husband for everything, it's not easy but I have no other choice"a 46 year old women from Olukonda village.

The little money I get from my husband I have to share between buying food from the shops since we did not produce enough from the mahangu field and maintaining the children" a 24 year old women from Okandiina village.

According to Ambunda and de Klerk (2008), the Maintenance Act was passed by Parliament as a result of the difficulty women continued to experience in securing maintenance from the fathers of their children, as well as in the inefficient operation of maintenance courts. The Act aims at implementing more effective mechanisms for securing maintenance in order to avoid or at least minimise the high number of women facing traditional approaches to maintenance under customary law. Section 3 of the Act states that both parents of a child are liable to maintain that child. This applies regardless of whether the child in question is born inside or outside the marriage of the parents or born of the first, current or subsequent marriage, and regardless of whether the parents are subject to any system of customary law which does not recognise both parents' liability to maintain a child. Also in terms of the Maintenance Act 9 of 2009, single women can legally claim maintenance for their children or for themselves. It is a

crime to disobey a maintenance order. In terms of section 39(1) of the Maintenance Act, a guilty party will be liable to a fine not exceeding N$4,000 or imprisonment for a period not exceeding 12 months, or such periodical imprisonment as set out in section 285 of the Criminal Procedures Act (Legal Assistance Centre 2010).

"*My husband left ages ag. He does not come home to visit and he does not send us money either" a 46 years old women from Olukond A village.*

"I don't want to report him for maintenance because he is my husband", a 35 years old women from Okakolo village.

Women are not using the Maintenance act to claim for maintenances from their husbands, because majority of the Namibian rural women are uneducated and does not know of the existence of this law, and if they know then they are scared of being disowned by their husbands or the women are prohibited by their cultural norms to claim maintenance from their husbands and boyfriends.

In times of drought women are the first to search for food for the household. In a study carried out by Angula (2010) in Namibia, it was revealed that women are the first to diversify their livelihood. They do basketry, process marula nuts and oil or sell their chickens, pigs or goats to raise money in order to buy food. This is an indication that women have other means of adapting to droughts than to depend on their husbands for maintenances (Angula, 2010).

"Women really try very hard to adapt to droughts. Since we are the ones cooking we can at least see if there is enough food or not, then we start to look for the food", a 59 years old women from Okandiina village.

"During the droughts we only eat two times a day, we only eat breakfast and dinner and skip lunch", a 66 year old women from Olukonda A village.

The researcher noted an interesting behaviour during the key informants' discussions. Women were more vocal and participated more in the discussions than the men. Women were free to express their views during the discussions, citing how they are overburdened with household chores than the men. This could be because women in the focus group were women who are educated about their rights, since these women are attending trainings on gender equality. Generally women are known to be less educated than the males, which at times lead to female households having less information on drought adaptation. With regard to male households on the other hand, men tend to have access to better information than women, information that can be used to modify production practices (Core, 2005). In contrast, in the Philippines, the farm roles of female household heads are changing as farms struggle to adapt to droughts. Women's farming experience and relatively greater education levels compared to men in this setting are enabling them to take on greater managerial responsibilities, challenging traditional gender roles (Carrington, 2013). This was also confirmed in a study conducted by Nhemachena and Hassan (2008) that indicated that female headed households were more likely to take up drought adaptation methods in the Nile basin of Ethiopia. This seems to suggest that the influence of gender on drought adaptation varies among cultures and social structures.

A male key informant reported that traditionally, men have more land rights than the women because women were not allowed by tradition to own land before independence, but after independence both men and women have equal rights to own land. *"Yes we can buy our own*

land as women. I am a single mother and I own this house", a 39 year old women from Olukonda A village.

"Yes I paid N$600, 00 to the head man and I was given this piece of land, but I am not happy because the demarcation of the land is not fair. Men are usually given big pieces of land then women", a 48 years old woman from Okalolo village.

According to Williams (1991), rights to land were held mostly by men in pre-colonial times. They distributed their land among their wives where polygamy prevailed, or among their wives and married sons or cousins residing in their homesteads. Husbands claimed the largest and most fertile portions of the land.

"*In the past a women or wife you were given your piece of land from the main land by your husband, for you and your children to cultivate. After cultivating your own piece of land, then you and your children have to go and cultivate your husband las as well. Now that there is droughts we do not cultivate two pieces of land any more, my husband and I share one piece of land", a 66 year old women from Olukonda village.*

Women were required to cultivate their own plots as well as those of their husbands. In most cases the harvests of women sustained the household while the granary of their husbands served as a symbol of wealth, enabling them to buy cattle, among other things. The National Gender Study (Iipinge et al., 2000) appears to confirm this state of affairs, when he said that, the man controls and has authority over the household resources. The man allocates land for cultivation to his wife/wives on the smaller and less fertile ground, while he takes the larger and more fertile one. It is the man who decides when to plough and normally his fields are ploughed first. Although men are still widely perceived to be the owners of land and other

assets in households headed by men, this situation appears to be changing, as was suggested by the Participatory Poverty Assessments carried out in Omusati, Oshana and Oshikoto in 2005/06 (RoN, 2007a; 2007b; 2007c).

In Olukonda, some participants stated that the ownership of land still rested largely with men in male-headed households. This was explained by referring to the fact that men generally identified fields and obtained land rights from the Traditional Authorities (RoN, 2007b, p. 93). In other instances participants stated that men and women owned the land more or less equally. *"We all have equal rights to own land, even though in the past women were not allowed to own land" focus group discussion.*

A critical missing piece in droughts gendered adaptation strategies is the importance of women's land rights. Securing women's land rights could enhance resiliency to droughts and strengthen communities' ability to respond well to shifting circumstances. Because women's land rights are already often tenuous and insecure due to both *de jure* and *de facto* gender discrimination, within the context of droughts adaptation they often come in last. This puts rural women at a particular risk given their substantial reliance on land, and their indispensable role in agricultural and food production (Ambunda and de Klerk, 2008).

After independence, Namibia put in place legislations that regulate land rights and ownership, for example the Communal Land Reform Act 5 of 2002, which makes it categorically clear that all communal land belongs to the state, but that the government has the responsibility of administering the land in the best interests of the traditional communities concerned. According to the Act, the communal land is held in trust by the government to promote the economic and social development of the people living in

communal areas. The Communal Land Reform Act grants women equal rights when they apply for communal land, and it protects the surviving spouse of the deceased holder of a customary land right by giving the surviving spouse, who are women in most cases, the right to apply to the chief or traditional authority to reallocate such right in his/her name (Communal Land Reform Act 5 of 2002). "*The woman only has land rights when it comes to the provision of settlement plots but women do not own traditional village houses, this is given to men only" (male key informant).*

4.7.1 Decision making power for women

The study found that women have more decision making powers and control over household resources. Since women are the first to notice that there is no food to eat, the women are the ones who decide on how the little food that is left in the house is going to be portioned. The women are also the first ones to search for ways on how to feed the family. For example the women will go out and do domestic work to be paid a salary or in exchange for food items to feed her children. In terms of decision making powers, the present study found that men and women have equal decision making powers (Legal Assistance Centre). This was also reported in a study done by Angula (2010), which revealed that, women and men in Epyeshona and Daures villages in Namibia have experienced changes in local climate over the past two decades. The degree of climate change impacts and the exposure of women to climatic risks are high. Similarly, the emotional burden and extra effort is felt more by women than men. "Traditionally women are submissive to their husbands and they would explore first other means of ensuring food security before they discuss the matters of food shortage in the household with their husbands, the 'heads of households' (Angula, 2010).

The farmers indicated that both men and woman can make important decisions regarding the family. The farmers also indicated that men make decisions on the use of land, how the land is to be cultivated and the women are left with the decision to run the household activities such as cooking, cleaning and looking after the children. The women also indicated that men are now consulting on issues concerning the family and women are also given opportunities to contribute to discussions. However, farmers in Olukonda indicated that in the past women's concerns were not regarded as important and that women were not given decision making powers as the decision-making powers are usually vested in the man. Women were regarded as dependents and, therefore, they were supposed to follow the decisions and directions by the man. In contrast to the present research's findings, Ravera and Martin (2016) point out that to guarantee food security in the face of droughts in India, both men and women prioritise the adoption of traditional crops and varieties with specific nutritional properties especially millet and pseudo cereals. It is worth noting that other collective adaptive strategies were also prioritised and adopted, such as taking common decisions on land and management and sharing planting materials and land among farmers in the case of crisis in India compared to other African countries such as Ethiopia (Ravera and Martin, 2016).

"When it comes to food and food production women have more decision rights then men", a 35 years old women from Okaloko A village.

"My husband makes all the decisions in the house since he is the owner of the house. Sometimes he does not even consider my contributions simply because I am a women" a 47 years old women from Okandiina village.

In terms of the customary law in Namibia, the husband was regarded as the head of the house and he makes all the important decisions. Iipinge (2010) reveal that men are seen as the stronger sex compared to women. A man is a strong person and is believed to be an indispensable tool and that where a man is there should be no hunger. A woman, however, is symbolised as a clay pot, a spoon or as a child. These similes imply that a woman is physically weak, she is an indispensable tool for the man and that she cannot lead an independent life without a man. According to the Legal Aid Center (2015) women in Namibia are now protected by the Married Persons Equality Act which abolishes marital powers and gives both the husband and wife equal powers. Before the Married Persons Equality Act, the legal position was that the husband had the final say on all important family decisions, such as where and how the couple would live. If the husband and wife had a dispute, the law said that the husband would be the winner because he was the legal "head of household". The Act repealed this legal rule.

"Yes my husband and I makes all the decisions together, even though he is the last one to say what need to be done" a 51 years old women from Olukonda village.

This statement is in line with Ambubda (2008), who says that a woman may be consulted for suggestions or advice. If a wife's suggestion or advice conflicts with that of her husband, the husband will automatically rule it out. The woman's contribution to decision-making is only recognised on matters that pertain to the children. A woman does not have any power to control household resources.

This means that families are now free to decide amongst themselves how they will handle family decision-making, but the law will not automatically support the opinion of the husband over the opinion of the wife. If the family wants to treat the husband or the wife as the head of the household, or to make decisions by consensus, this is their own private business Legal Aid

Center (2015). According to Angula, (2010) couples can still turn to religion, tradition or other values for guidance on the roles of husband and wife. But the law no longer favours the husband. Men's primary role is that of breadwinner and decision-maker, and women's primary role is that of family caretaker. As a result, household members often unknowingly redefine gender roles as they take action to adapt to drought. These actions and opportunities are influenced by the broader institutional environment in which households exist and interact such as the state, the market, and the community. It may be easier for women to step outside their traditional roles for the sake of their children than for men to find ways to adapt to droughts. For example, men may be ashamed to do traditionally women's work, but society pardons a woman for doing a men's work when she does so to feed her children in order to adapt to droughts effects (Iipinge and Le Beau, 2005)

"*In our culture, men are not allowed to enter the kitchen area, thus men find it difficult to cook when the wife is not at home or when she is sick" a 51 year old men from Okaloko village.*

"I am a modern men, I cook for my children when my girlfriend is not at home", a 29 years old men from Olukonda village.

4.7.2 Girls' education

The farmers revealed that girls were not formally educated and that girls' education was not important because the girl would get married and move to the husband's house, but these have changed after independence. This could also be because one of the pernicious features of gender inequality is that it feeds on itself; parents may have lower aspirations for their daughters than for their sons, and so their daughters too have lower aspirations for themselves (Beaman *et al*, 2011). Social norms define the roles that women and men have in the family and the community, the

expectations they have about their futures, their individual preferences and the kind of relationships they form. For example the direct costs (e.g. school fees where they exist, uniforms, transportation) and opportunity costs (e.g. time could have been spent working or helping the family) of school often impact boys and girls differently (Beaman et al., 2011). In Mali, although few people claimed that schooling was a burden on domestic life especially in times of droughts, it became evident from a number of statements that the additional labour provided by the girl child was sorely missed at home (Masika, 2002). The labour of girl children is often described as particularly useful for families, and it is directly related to low female student enrolment. In India, girls' time is devoted to household domestic purposes, preventing them from attending school (India, 2007a). As more work is required of women to supply water from more distant sources in order to adapt to droughts, in many parts of the world, girls will miss schools in order to help meet family water needs.

"In the past, girl's education was not important the belief was that, the girl will get married and leave the parental house and move to her husband" a male key informant.

"Today education is regarded as very important for both boys and girls" a male key informant.

Good quality education can be life-changing for girls, boys, young women, and men, helping them develop to reach their full potential and putting them on a path for success in their life. It is also know that educating a girl in particular can kick-start a virtuous circle of development. More educated girls, for example, marry later, have healthier children, earn more money that they invest back into their families and communities, and play more active roles in leading their communities and countries (Beaman et al., 2011). Thus, according to the Education Act 1 of 2001, Article 20 of the Namibian Constitution guarantees the right to education and provides for compulsory education until the completion of primary education or until the child reaches the

age of 16, whichever comes first. It also obliges the state to establish and maintain state schools "at which primary education will be provided free of charge". This right applies to "every resident within Namibia" and it means that all children in Namibia, not just Namibian citizens and not just children in low-income families, are entitled to free primary education. The provision on the right to education is part of the fundamental rights and freedoms which are enforceable by the courts (Education Act 1 of 2001- Ministry of Education). This is in line with discoveries done by Dunleavey in New York who says that, with the importance of education emphasized nationwide, and the access of college degrees (online, for example), women have begun furthering their education. Women have also started to get more involved in recreation activities such as sports, which in the past were regarded to be for men. Family structures are changing, and the number of single-mother or single-father households is increasing. Fathers are also becoming more involved with raising their children, instead of the responsibility resting solely with the mother.

"Education is compulsory for both boys and girls all my children are attending school especially now that we don't need to pay school fees" a 35 years old women from Olukonda A village.

.Many women have a strong body of traditional and environmental knowledge gleaned from years of helping their female relatives, collecting and managing resources, and raising their families. When they are in control of resources, women are more likely than men to use them for family health and economic stability. Research done by Kaspar (2006) in Nepal, also shows that women may be more likely to change strategies in response to new information and to make decisions that minimize risk. All these qualities suggest that when women are educated and empowered, they can be extremely effective agents of adaptation to droughts.

4.7.3 Inheritance rights for women

The farmers felt that men and women have equal inheritance rights in independent Namibia, but before independence women could not inherit land from their husbands or family members. Often they were violently dispossessed of property by relatives following their husbands' death. Property grabbing has steadily increased in Namibia. Under most customary systems, women - at least traditionally - do not own or inherit land (Legal Assistance Centre, 2007). This is partly because women are perceived to be part of the wealth of the community, and therefore they cannot be the locus of land right grants. For most women, access to land is via a system of vicarious ownership through men such as husbands, fathers, uncles, brothers and sons. Customary rules, therefore, have the effect of excluding females from the clan or community entity. Widowed women traditionally do not inherit land, but they are allowed to remain on the matrimonial land and home until their death or remarriage. In times of droughts, widowed women have to adapt to droughts on their own or with the help of the extended family members *(Mercedes, 2010).*

"In the past when the husband dies the land was inherited by the husband's family, and if the family is having a boy child then the house and land is given to the oldest boy" women key informant.

"After independence women can inherit from the husband but this also depend from the decision made by the late husband's family", a male key informant.

The rules governing inheritance in Namibia were influenced by the advent of colonialism (1884) as well as apartheid (1915). Inheritance and succession laws were determined by colonial statutes, which made a distinction between the blacks, the so-called coloureds, and the whites.

The Intestate Succession Ordinance 12 of 1946, for example, determined the dissolution of property for all except black Namibians (Legal Assistance Centre, 2010). The Native Administration Proclamation 15 of 1928 regulated the process of succession for black men, but only those living in certain parts of Namibia. These regulations made the type of marriage and the marital property regime the criteria for determining the rules of intestate succession that applied to blacks (Core through the Legal Assistance Centre, 2005). The Proclamation only applied north of the so-called Police Zone 46, and provided that the estates of all black persons regardless of the circumstances of any marriage they may have entered into, was to be distributed according to native laws and customs. This is a clear picture that despite the Proclamation, communities were nevertheless at liberty to apply their customs and traditions with regards to inheritance. Women were still left with the little that they owned during the duration of these marriages, since they had limited or no rights to real property such as land rights and cattle (Core through the Legal Assistance Centre, 2005).

According to The Ondonga Traditional Authority (2000) women are now protected by law and automatically they can inherit land from their husbands. Women in Olukonda indicated that in times of drought, widowers have to adapt to droughts through the estates left by their husbands. This means that the women have to sell some of the cattle they inherited from their deceased husbands in order to feed their families or to adapt to droughts. *As a widower I have to find means and ways on how I am going to feed my children and grandchildren especially in times of droughts like this. I sometimes get help from my neighbours or from my extended family members" a 66 years old women from Olukonda A village.*

The changes observed must be traced to the adoption in 1993 of the revised Laws of Ondonga for all four north-central regions as well as the Communal Land Reform Act 5 of 2002 -these

revised customary laws provided protection for widows and the property belonging to the household. Widows are not only allowed to stay on the land of their husbands, but they are also no longer required to pay to acquire his land rights (Traditional Authority of Ondonga, 2000). The Communal Land Reform Act 5 of 2002 in turn codified these provisions in law. The revised customary laws also responded to a dynamic and changing social and economic environment which has brought about changes in inheritance systems and practices; this law helps protect widows' rights to communal land tenure. It is the only major law reform to date in respect of customary law. If a husband dies, his widow has a right to remain on the land if she wishes to. She is entitled to keep the land even if she re-marries. If there is no surviving spouse when the holder of the land right dies, then the land will be re-allocated to a child of the deceased identified by the Chief or Traditional Authority as being the rightful heir. The law is actually worded in gender-neutral fashion, but widowers were not historically forced off the land when their wives died. The Act provides that upon the death of the land rights holder, the land may be reallocated to a spouse or another dependent (Ambunda, 2008).

"My husband past away a long time ago, I think it's now 30 something years back. When he died the house and the land was given to my eldest son who also died years back. This house now belongs to my grandson and his wife. They are now taking care of me since I am old" a 66 years old woman from Olukonda village.

4.8. Gender roles and adaptation

"Yes women have decision making powers as you can see our councillor is a woman, meme Vicky seating right there", stated the chairperson of the CDC.

Even though women gain decision making powers, gender roles still exhibit conventional division of labour between men and women in rural settings. The farm household in Olukonda is structured by rigid gender roles. The women in Olukonda performed all domestic, household and caregiving work during droughts. Gender roles are the characteristics, and thus duties and responsibilities attributed to members of the two sexes by virtue of the fact that they are male or female, hence they are most prominent within the sphere of the family household (Ambunda, 2008). Duties are divided between husband and wife and siblings based on stereotypes of what men should do and how women should behave - and not necessarily on ability or capacity. As in other Southern African countries, these roles and responsibilities are very much linked to the utilisation of natural resources (land and water). However, again, resource management or control over resources is vested in the man: the man is regarded as the head of the household and this position gives him absolute control over all household resources such as livestock and income from all sources. Research done by Amber (2007) in Canada on Manitoba farm shows found that farm women experienced high levels of stress as a result of the disaster. The women's stress was due, in part, to their lack of control over major farm decision and coping strategies (Reinsch, 2009).

In Olukonda constituency, women are responsible to cultivating the *mahangu* field, looking after the children and elderly, cooking, fetching water, cleaning the house, collecting wild fruits, pounding the *mahangu*, brewing traditional beer, washing clothes, collecting fire wood, harvesting crops, selling *kapana (roasted meat)*, weaving baskets and selling *marula* oil; the women perform these duties as required by culture.

"Akiindu ohatu limi momapya pethimbo lyovula (we women cultivate the mahangu field)", a 20 years old women from Olukonda.

"Women do basically everything, this include cooking, fetching water from the wells or community tabs, collecting wild fruits and pounding mahangu" a 46 years old women from Olukonda A village.

The men on the other hand are responsible for: looking after the livestock, selling livestock, cultivating the *mahangu* fields, harvesting crops, digging wells, fixing fences, building storage bins (granaries) and making leather belts. Women have historically played integral roles in food preparation, childcare, and healthcare roles that are critical during droughts but that has become more difficult to carry out during such events (Enarson & Chakrabarti, 2009). *"As a men I look after the cattle's and provide food to my family", a 39 years old men from Olukonda constituency.*

"I don't do much at home because I have a paid job in Windhoek, but I do come back home during the rainy seasons so that I can hel with cultivation", a 42 years old men from Okandiina village.

Entrenched gender roles can therefore create different experiences of disaster for women than for men and also creates different adaptation strategies (Dankelman, 2010; Enarson & Chakrabarti, 2009). When asked who does most of the work at home during droughts, only four participants felt that the response to droughts depends on individual personality and it is not gendered; the other respondents felt that gender roles make a difference.

"If we help each other at home both husband and wife then women could get time to rest, but now I a dry season like this men spend most of their time at the shebeebs", a women 48 years old from Okaloko village.

According to Ambunda (2008), the culture of Oshiwambo-speaking communities requires that a woman prepares food for the household, and tills, ploughs and weeds the crop fields. She is expected to harvest her crops and pound the *mahangu* into flour. Other household roles a woman is meant to perform include caring for the family, collecting water, weaving baskets and making clay pots - both as cooking utensils in the homestead and for income-generation - and to brew traditional alcoholic beverages. Bye (2005), argues that farm women in Namibia actively reinforce gendered roles and ideologies during droughts, which have the effect of reproducing gendered inequalities and, therefore, gendered vulnerability which leads to gendered adaptation. Women and men can be similarly exposed to the same climate conditions and contextual differences including gendered divisions of labour which can produce different degrees of sensitivity and different forms of adaptation (Leichenko & O'Brien 2008; Milne, 2005).

The natural or agricultural products available in Olukonda are: sorghum, nuts, melons, beans, spinach, tomatoes, and pumpkins. Most of the products are only available when the constituency has received good rains. In times of droughts the women have to collect wild fruits such as *eenyandi* and *eembe* (berries) which they process and produce alcohol to sell in order to buy food from the nearby super markets such as Shoprite in Ondangwa. Women and men are affected by droughts differently and therefore their adaption strategies also vary. Their ability to adapt to droughts depends on access to resources. Some resources can be income, employment, technology, skills, education, infrastructure, management and capabilities (Masika, 2002).

"When we (women) are bored we go in the field and collect wild berries or mopani warms", a 46 years old woman from Okandiina village.

There are no rivers or springs in Olukonda, so men have to dig wells for human and livestock consumption in times of droughts. The farmers indicated that the government introduced the

program of work for food in the past but with the current drought this was not carried out. In order to adapt to droughts and water shortages, men and women participated in this to dig wells for water for the community and in return they were compensated with food for the family.

"In the past government introduced the food for work programme during the droughts, this programme help us to at least have something to eat at home in times such as these", 51 male from Okaloko village.

"Since there is no water in the community we men gather at the head men's house and decide where we are going to dig the next well in order to provide drinking water for our families and animals", a 57 years old men from Okandiina village.

Table 3. Labour activities profile for Olukonda constituency

Men	**Woman**
Looking after the livestock	Cultivating
Sell livestock	Weaving baskets
Cultivating	Cooking
Harvesting crops	Fetching water
Dig wells	Cleaning the house
Fixing fences	Looking after the house
Building storage bins (Granaries)	Collecting fruits from the fields
Makes leather belts	Pounding *mahangu*
	Brewing traditional beers
	Washing clothes

	Collecting fire wood Harvesting crops Selling *kapana* Selling marula oil

In Vietnam, for example, Shaw et al. (2008) found that women have to collect water from water sources that were further and further away as each drought takes its toll. Asheber (2010) found similar results in Ethiopia, and Dankelman et al. (2008) in Senegal, where women were more severely affected by water shortages than men, largely due to their role as water collectors for the household. This has prompted income-driven deforestation by the community, which has severely reduced the availability of trees for wood. Women have to walk much further to obtain wood for fuel, and this was viewed as a dangerous task on steep mountains as that took about six hours every three days (Dankelman et al., 2008). Water and fuel shortages caused directly and indirectly by droughts pose considerable time and labour burdens for women.

Women in this study indicated that they too have to walk long distances to collect water from wells or public taps. Women are not only passive victims of droughts but they are also effective agents of change in relation to adaptation. Women's responsibilities in households and communities as stewards of natural resources have positioned them well to understand and innovate livelihood strategies adapted in response to droughts (Aoyagi *et al.*, 2011). However, most women interviewed said that they no longer have long walking distances to collect water because they have water taps at their houses.

There are mainly two sources of water supply in rural Namibia, namely: (1) boreholes, under the Ministry of Agriculture, Water and Forestry and (2) the water pipeline scheme, provided by Namibia Water Corporation, known as Namwater. The pipeline scheme allows individuals to apply for water connections and pay user cost fees to Namwater directly. Communities living along a pipeline apply for water connections, and then pay a monthly water supply fee to Namwater. *"I do not collect water because I have a tab at home, but my neighbours have to walk a long distance to collect water from the community water tank", a 46 years old women from Olukonda A village*

Namwater is a public entity operating under commercial principles. It sells water to the mining companies, as well as to the municipalities which in turn sell it to urban residents and businesses. Residents in rural areas receive water through public standpipes equipped with prepaid water meters. Prepaid customers pay about USD 1.9 per kilotre (cubic metre), or about USD 0.038 per 20 litre container. Farmers have also indicated that in order to adapt to droughts the less fortunate women in far constituencies such as Eengondi and Omuntele Nehale la Pingana constituencies in Oshikoto region still have to walk distances to collect water because there is a lack of supply of water in those constituencies.

"Woman in constituencies such as Omuntele and Eengondi are still travelling about 10 km using donkey carts to collect water", stated a key informant.

4.9 Differences in adaptation to droughts between men and women

The study discovered that both men and women adapt to droughts but women adapt better to droughts compared to men. Often, women are more vulnerable to droughts than men. This is because women do most of the agricultural work, they bear unequal responsibility

for household food security, carry a disproportionate burden for harvesting water and fuel for everyday survival, and they rely on threatened natural resources for their livelihoods (UN Women Watch, 2009; Terry, 2009; Mitchell et al., 2007).

This study also found out that during the droughts women help each other in terms of food. The women farmers indicated that they can ask the neighbours for food in order to feed their children. Since women are the main providers of food and meals for their families, women may bear a greater burden to fulfil this task when climate events become adverse (Jungehülsing, 2010). Similarly, Angula (2012) found that in Oshana region during droughts, out of their submissiveness to their husbands, women first explore other means of ensuring food security before discussing the matters of food shortage with their husbands.

In order to cope with the droughts, women were also the first to diversify their livelihoods:

"As a woman you must try by all means to feed your family. You can use your pension money to buy food or you can weave baskets and sell them and exchange them with mahangu grains", stated a 67 year old woman from Olukonda A village.

A 66 year old woman from Olukonda A village explained that "If there is little food at home, I sometimes cook for myself and the children only while my husband is at the shebeen. When he comes back and asks for food I normally just tell him that there is no food in the house. Tate is left with no choice but to sleep with hunger that day"

Basketry, processing nuts and oil, or through sales of their livestock such as chickens, pigs, or goats are the means to raise money to buy food. Women also indicated that men do not assist them to cope with the drought because if a man gets money he would go to the shebeen and buys alcohol and come home demanding food. This is confirmed by Angula (2012), who said that

men have a tendency of neglecting their responsibilities as heads of the household by spending their money on alcohol or leaving the house in search of employment and never returning. Bradshaw (2004), also pointed out that following a disaster as has been a tendency worldwide, many male heads of households migrate resulting in an increase in the number of female headed households. The intention is to seek work and send remittances to the family, even when they do not send the money to the family after wards.

"Compared to men, women really try hard to adapt to droughts, women are always in the kitchen, they can at least see if there is no food at home and they start to look for food for the family. The men are so dependent on the women to provide food", a 40 year old women from Okandiina village.

In past studies of drought, seeking alternative employment is one of the coping mechanisms available to drought affected farmers. Most of the women interviewed said that they sometimes engage in domestic work either in their villages or at the nearby towns like Ondangwa and Oshakati in order to make money and buy food for the household. Women in the weakest economic positions are often the most vulnerable to droughts. They tend to have limited adaptive capacities and they are more dependent on climate sensitive resources such as forest, water and food supplies (IPCC, 2007).

Men interviewed indicated that they sell their livestock in order to buy food and grass for their animals. Attempts to achieve this involve de-stocking by selling their livestock and collecting acacia pods to feed goats. Davies (2000) indicated that buying and selling cattle is generally recognised as a common strategy to cope with fluctuations due to droughts in many rural areas. However, a large number of households often do not own any. This is in accordance with a study

done by Ndlovu (2010) in Bulilima and Mangwe districts of Zimbabwe that observed that asset disposal has increased over the years with selling of cattle and livestock such as goats and chickens being the most popular coping strategy in the two districts. Ndlovu (2010) also confirms that some cattle in Zimbabwe may be sold to buy supplementary feeds to save other cattle during years of drought.

This study has observed that although the selling and consumption of small livestock, especially goats and chicken was common to most of the households who had them, this coping mechanism did not considerably reduce vulnerability because of the little money they get from it.

As indicated before, men also migrate out of Olukonda constituency to other constituencies in search for work and better grazing opportunities. Migration has been cited by Dercon (2002) as one of the coping strategies in drought disasters. Bradshaw (2004) warns that migration comes with a lot of challenges. Brandshaw (2004), further argues that following a disaster as it has been the tendency worldwide, many males migrate, resulting in an increase in the number of female headed households. For women who are left behind, the impact is twofold: not only awaiting a remittance that takes time to arrive, but also to be left without subsistence resources (Bradshaw, 2004).

4.10 How adaptations have improved

The majority of farmers indicated that people are coping better with droughts than in the past because currently people are receiving assistance from the government. The assistance received is the drought relief food which includes; 2 bags of maize meal, fish cans, sometimes meat, and oil. Farmers pointed out that even though the food is not distributed every month or on time, the

food helps households that are heavily affected by the droughts. Farmers indicated that in the past food aid was only given to identified vulnerable households but currently all the households are said to be affected by droughts and thus they are all considered to receive the food. Droughts relief have been implemented in Zimbabwe to avert hunger and famine. Similar to Namibia, some of the Zimbabwean government drought relief objectives have been to prevent hunger, starvation, malnutrition and disease outbreaks, reduction of malnutrition of under-fives through supplementary feeding and the protection of the asset base of rural households from the distress of selling assets (Goz, 2005). *"Our government is taking care of us by giving us drought relief food" stated one of the woman from Olukonda village. "Ohatu hupile ngaa moshikukuta" (we survive from the drought relief food), stated a woman from Olukonda village.*

Farmers affected by droughts received assistance during normal seasons and during droughts. Such help as claimed by farmers in Olukonda were in the form of money, food and groceries from friends and families: others indicated that the monthly child grants and old age pension as a form of assistance from the government is helping them to cope with drought effects. This is in line with work done by Holloway (2003) who argues that beside farmers' initiatives regarding agricultural production in terms of risk reduction, households in South Africa received assistance in the form of inputs from institutions such as governments.

The availability of clean and adequate water supplies for domestic purposes could not be over emphasised by farmers during drought periods. Farmers indicated that the government has made the provision of tap water at their houses a possibility, which has made life easier for them. The provision of tap water has also reduced the burden for women to travel long distances to collect water for household use.

> Building up of stocks of food and other saleable assets is cited as one of the important coping strategies of rural households (Dercon, 2002; Wisner et al., 2004; Ndlovu, 2010). Rural people who have access to land often store grain and other staple food. This is an important defence against expected seasonal shortages, as well as prolonged periods of hardship (Ndlovu, 2010). In this study, farmers indicated that they could cope better with the past droughts because in some seasons they could get enough harvests and then they store *u* which they could in times of droughts. But with the current drought (2014/2015and 2015/2016), this has become impossible, because they did not receive a good harvest from the 2014/2015 and 2015/2016 harvest as there was drought in those years as well. *"Mo paife ngeyi ihatumono sha momapya" (with the current (2015/2016) drought we did not receive any harvest from our fields,) a 29 year old woman from Olukonda village complained during the interview.*

Another farmer indicated that she could cope better in the past because in the past older people were looked after by their family members, but currently each family will only search for food enough for their households. Dercon (2002) also argues that in adversity people rely on social networks. These include rights and obligations between family members of the same household and with wider groups with a shared identity such as a clan or tribe. However, this practice seems to have diminished in Olukonda constituency.

4.11 Conclusion

In summary, the study have revealed that the farmers are adapting better with droughts then in the past because of the assistance from the Namibian government. The farmers revealed that the women are the first to prepare for the droughts since women are expected to cope and develop adaptation strategies. Women's responsibility in the household and the community as stewards

of natural resources have positioned them well to understand and innovate livelihood strategies adapted in response to droughts. Even though women gained decision making powers, gender roles still exhibit conventional division of labour between men and women in rural settings such as in Olukonda constituency.

CHAPTER 5

RECOMMENDATIONS AND CONCLUSION

The aim of this research was to explore the farmers' gendered adaptation strategies to droughts in Olukonda constituency in Oshikoto region. Furthermore, it explored how the modes of adaptation relate to gender differences. The research was undertaken to demonstrate the relationship between men and women's adaptation to droughts given the challenges of droughts and gender differences. Farmers were forthcoming in discussing their experiences and opinions concerning their adaptation and coping strategies. A phenomenological approach was used with lived experiences of farmers as the focus. Themes and sub-themes came to the forefront as the data was analysed. In this chapter, conclusions are drawn and recommendations made based on the research, discussions and literature review of previous chapters. Recommendations are made on the grey areas that were identified by the research and further research proposals and contributions of the study to the body of knowledge are presented.

The research offers a number of general and policy recommendations. Some are directed towards gender while others to droughts adaptation.

5.2 Study purpose review

The purpose of this research was to explore how men and women adapted to the 2013/ 2014, 2013/2014, 2014/2015 and 2015/ 2016 droughts in the Olukonda constituency.

The central problem researched was to find out how famers in Olukonda constituency adapt and cope with the droughts and how the modes of adaptation relate to gender differences. This thesis was undertaken to demonstrate the relationship between men and women roles given the challenges of drought and gender differences.

This chapter validates the study in terms of its purpose and objectives in relation to the experiences of droughts in Olukonda constituency and it provides recommendations regarding research findings. The study objectives were:

- To investigate the modes of adaptation to droughts by men and women in Olukonda constituency
    - To assess how the modes of adaptation relate to issues of gender differences
    - To investigate the views of men and women on gender roles
    - To explore how gender differences to adaptation could be changed
- To explore the extent of awareness of gender empowerment and equality issues within households

6.2 Recommendations

6.2.1 Recommendations in terms of farmers' preparedness

Most farmers claimed that they were not prepared for the droughts because of a lack of information about impending disasters, while others claimed that they did not know what to do to prepare even if they had access to such information. This research made it known that with farmers' financial status and lack of information, it is impossible to adapt and cope with droughts without external help or assistance from government and agencies at all levels. Making useful information about an impending drought may not be enough; there is a need to go a step further by providing information about how to adapt with such disasters.

Among other stake holders such as manufacturers of agricultural equipment, utilities and various inputs, farmers are one of the most important end users of early warning systems. As such, information about anticipated weather or climate changes should be communicated to them on

time so as to be able to strategies ahead of such impending disasters in order to reduce their level of vulnerability to such disasters. In the light of this, all available medium of communication and awareness should be employed to convey information about any form of disaster.

Considering that most rural farmers in Namibia do not have control over various production factors such as arable land, grazing and their homes because most of them are cultivating on communal lands which does not belong to any individual as well as their homes which are mostly government owned houses or land and as such they could not pledge, sell or even use them as collateral in order seek for financial assistance while trying to cope with drought. It would be recommended that farmers should be advised and equally trained from time to time on how to adapt to drought and its associated effects or problems, and this should include preparedness.

Studies done in South Africa show that during droughts farmers developed a number of strategies ranging from varying the seeds variety taking up maize resistant cultivars, increasing or decreasing hectares of the drought resistant crops, intercropping, and changing planting dates, and applying conservation agriculture to mixed farming of crops and livestock. This strategy was not used by the farmers in Olukonda constituency. It is recommended that farmers should be trained on the availability and use of a variety of seeds that are drought resistant and that can help them to produce more food in times of droughts. Farmers can at the same time be encouraged not to only concentrate on their traditional way of cultivating *mahangu* but also to consider cultivating maize. Improved maize production offers higher returns which can improve food security in food deficit areas.

Farmers should be encouraged to store hay at all times, protect vegetation cover, trained and educated on certain farming ethics with regards to droughts as well rational use of water. Also

the use of various tested drought resistant plants and other agricultural inputs should be introduced to rural communities prone to droughts so as to gain and improve their confidence level on such inputs over time.

During the droughts periods or other agriculture disasters, farmers tend to migrate to nearby towns and regions in search of in search of alternative source of income. At such times, government could bring about developmental activities which include rural community such as road construction, drilling bore-holes, government owned gardens, income generating projects which target rural women and men; this would in a way provide a temporary employment and income to farmers to ease the effect of disasters.

There is a need in Namibia to evaluate all policies and programmes in terms of their environmental impact, gendered adaption strategies and their effect on women's equal access to and use of natural resources.

The Government of the Republic of Namibia need to educate and increase women's access to information and education, including in the areas of science, technology and economics, thus enhancing their knowledge, skills and opportunities for participation in environmental decisions.

In terms of legal frame works the government need to ensure the effective implementation of current laws and policies promoting equality in the family, including the Married Persons Equality Act, the Maintenance Act, the provisions pertaining to widows in the Communal Land Reform Act, and the Combating of Domestic Violence Act.

The government also need to align Customary Laws with the Namibian Constitution, by removing all components that discriminate against women, to bring customary laws in line with the Namibian Constitution.

During the key informants' meeting, the farmers suggested the following recommendations:

- The farmers in Olukonda constituency recommended that the government should install water tanks for water storage during the rainy seasons, in order for the farmers to store water to be used during the droughts. The farmers requested for the water tanks to be installed at every household in Olukonda constituency. The supply of water will not only lessen the women's burden of collecting water but it will help the entire community to adapt to droughts.

- The farmers also recommended that the government has to promote the value of *mahangu* on the market and that the government to set up *mahangu* fields in the regions that are always receiving good rains. The *mahangu* fields will help with the *mahangu* production. Harvesting *mahangu* will help in food security during the drought seasons. The men indicated that since it is their responsibility in most of the times to buy and supply *mahangu* grains to the women to cook, the availability of *mahangu* grains during the drought seasons will enable the families to adapt to droughts.

- The Ministry of Education is providing porridge to vulnerable children at schools. The farmers indicated that the porridge provided by the Ministry of Education is helping the children to cope with hunger especially in times of drought. The farmers recommended the Ministry of Education to continue to provide the porridge and for the Ministry of Education to add some stable food to the porridge that is distributed. The farmers indicated that if porridge is provided at school, girls will be able to continue with their schooling and that the girls will not be required to remain at home to help the women to search for food in order to adapt to droughts.

The study recommends that drought adaptive me should develop comprehensive s of service provision regarding seeds, fertilisers, credit, market, access and agricultural extension services. Such programmes should ensure that women access these services.

Information and awareness programmes on droughts and agricultural production targeting rural women should be produced regularly in order to enhance their adaptive capacities.

Training in gardening targeting women should also be made available by the Namibian government to rural women.

6.3 Areas for further research

a) There is a need to research on the effects of droughts on household assets in Namibia.

b) There should be a research to determine the need to implement gender sensitive adaptation progrmmes.

c) More research to identify the gendered adaption strategies and adaptation priorities for urban women and men is needed.

d) A research by the Ministry of Agriculture, Water and Forestry on how to improve the early warning systems is needed.

5.3 Conclusion

Study reported that, majority of the respondent perceived temperature has increased and the rain pattern has been changed. According to the farmers in Olukonda constituency days has been prolonged with long drought period. Long drought period has affected in the production of agricultural crops.Farmers have observed that the rain came very late and stopped too early. Farmers have indicated that the start of rain fall season has shifted from September/October to

December/January and end of season has shifted from April/May to February/March. Farmers also indicated that the duration of rainfall has also been shortened from 7 month to 3 months. This in line with how Wilhite, 2000; Downing and Bakker, 2000; Whetherald and Manabe, 2002, has described drought to be a period of several months or even years of abnormal dryness due to below-average rainfall that causes a pronounced decrease in for age yield relative to what is expected in an average year.

The study probed awareness of drought and local perception of changes in rainfall patterns. Therefore, farmers were assessed on their knowledge of drought. There was a general perception that Olukonda and the whole of Oshikoto region have become drier over the years. The study point out that, when men and woman attempted to describe drought their understanding of drought were linked with a lack of rain and hunger. Participants indicated that drought is associated with a lack of rain which resulted in a lack of harvesting and loss of livestock.

Farmers had, however, employed a number of drought coping strategies in anticipation of, and during the droughts period. The farmers in Olukonda constituency indicated that their main mode of adaptation is the drought relief food which is distributed by the government in times of droughts. The distribution is done through the local authorities such as the constituency councillor's office and through the village head men/women.

The droughts affect the livelihoods of men and women differently. This study concludes that women are the first to find means to adapt to droughts. Women weave baskets, process marula nuts and oil, and sell chickens and pigs in order to raise money to buy food for the household. Men on the other hand are said to migrate out of Olukonda to other constituencies or regions in search of water and grassing areas for their livestock.

The study indicated that, in trying to adapt to droughts, farmers in Olukonda constituency have employed various adaptive strategies which include: households reduced the number of times they eat per day, for example eating only once per day, pensioners use their social grants to buy food, farmers received drought relief food from the government, farmers learn to eat other food varieties such as macaroni, rice, maize mail etc. which they buy from the shops. Moreover, farmers have started small businesses such as *shebeens*, farmers' dry reeds to feed their animals, farmers buy grass to feed their animals, seasonal migration by men in search for grass and water for animals, and farmers received assistance from employed family members.

Women were also the first to diversify their livelihoods through basketry, processing nuts and oil, or through sales of their livestock such as chickens, pigs, or goats to raise money to buy food. Because women are the main providers of food and meals for their families, women bear a greater burden to fulfil this task when climate events occur (Jungehülsing, 2010). Angula (2012) found that in Namibia during droughts, out of their submissiveness to their husbands, women first explore other means of ensuring food security before discussing the matters of food shortage with their husbands.

Women also indicated that the processing and selling of marula nuts have assisted them to cope with the effects of drought. Women indicated that having the marula tree on your property helps a lot. The marula tree is widely distributed in sub-Saharan tropical Africa; it is drought resistant and it is most common in open woodlands.

It was observed that the male farmers' adapted by selling their livestock: this was done mainly to reduce the effects being suffered as a result of droughts. Farmers had to sell their livestock at a giveaway price considering the situation at hand. There are also farmers who claimed not to have sold livestock and these are the farmers who did not have animals. The farmers indicated

that they had to sell their livestock because the livestock were dying of hunger and thirst. They indicated that it was better to sell the animals instead of watching them dying.

Men indicated that they migrate out of the constituency or region to other regions in search of grazing areas for their livestock. The findings about the migration of farmers for better grazing for their livestock concur with the work done by Agwu and Okhimambe (2009) that found that in Nigeria during dry seasons, temporary migration of men to urban areas results in women being left alone to take care of the household.

Since the women are the ones to provide food for the household, the study confirms that women and men's relationships with the environment, agriculture and forestry is differentiated. In addition, the activity profile assessment revealed that women in Olukonda interact with the environment more than the men.

This study illustrated that traditional gender based roles still persist. Traditionally, women are responsible for fruit harvesting and weaving baskets. Men mostly engage in livestock farming related activities.

This study also revealed that there might be changes in gender relations in the rural areas due to equal opportunities which were made possible by laws that were put in place to protect both men and women such as the Married Person's Equality Act of 1999, which was established to abolish marital powers, which was promulgated by the government of Namibia to women and men. The root causes of gender inequality have been the low status of women and girls and the negative cultural perceptions of gender roles which are practiced in times of droughts adaptation as well.

In Olukonda constituency, women are responsible to cultivating the mahangu field, looking after the children and elderly, cooking, fetching water, cleaning the house, collecting wild fruits, pounding the mahangu, brewing traditional beer, washing clothes, collecting fire wood, harvesting crops, selling kapana (roasted meat), weaving baskets and selling marula oil; the women perform these duties as required by culture. The men on the other hand are responsible for: looking after the livestock, selling livestock, cultivating the mahangu fields, harvesting crops, digging wells, fixing fences, building storage bins (granaries) and making leather belts.). Entrenched gender roles can therefore create different experiences of disaster for women than for men and also creates different adaptation strategies (Dankelman, 2010; Enarson & Chakrabarti, 2009). When asked who does most of the work at home during droughts, only four participants felt that the response to droughts depends on individual personality and it is not gendered; the other respondents felt that gender roles make a difference.

The concept of gender and its associated variables is no constant in any given society. Gendered adaptation and gender relations change over time in any given society. Namibian literature on gender and women describes the differences between women and men and their respective roles in respect to traditional norms and values. The study found that there are changes among gender relations in rural areas due to equal opportunities awarded to women and men. Women in Olukonda display signs of empowerment to participate in economic activities.

Men in Olukonda do not seem to understand how women are affected by droughts and poverty. Moreover, men do not seem to consider a possibility that men may be more vulnerable to the impact of drought than women.

Women in Olukonda feel that men do not maintain them and their households not only in times of droughts but in all spheres of life. This could be caused by attitudes among women from long

held beliefs that they are weak and they should be looked after. Women have complained that some of the men do not maintain the households in times of drought but men rather spend their time at the *shebeens* consuming alcohol.

The study reveals that women have more decision making powers and control over domestic resources and men still have the power to make major decisions regarding assets and financial resources. The study also found that women gain decision making powers and leadership hence the Olukonda constituency councillor is a women.

Findings of the present study are generally consistent with results of past studies on droughts adaptation. Changing of cropping systems during droughts, family members changing schools during droughts and the use of alternative sources of water for crops were not experienced in the study area.

Although some farmers tried various ways to manage and adapt with changes and the effects of droughts as stated in chapter 4, most farmers were unable to adapt effectively with the droughts mainly because there was a lack of information about drought occurrences and drought adaptation strategies as well as a lack of resources.

REFERENCES

Adams, T. and Welsh, S. (2008). *The organization and experiences of work*. Ontario: University of Western Ontario and University of Toronto Press.

Adger, W. N. (2000). Social and ecological resilience: Are they related? *Progress in Human Geography* 24, 347-364.

Adger, W. N. (2006). Vulnerability. *Global Environmental Change, 16(3),* 268-281.

Agwu, J. & Okhimamhe, A.A. (2009). *Gender and change in Nigeria: a study four communities in north-central and south-eastern Nigeria.* Heinrich Böll Stiftung, Nigeria. Retrieved from: http://www.boellnigeria.org/downloads/Gender Climate Change in Nigeria.pdf. Agrawal, & Perrin. N (2008). *Climate adaptation, local institutions, and rural livelihoods.* IFRI Working Paper W081- 6. Ann Arbor, Michigan: International Forestry Resources and Institutions Programme and University of Michigan.

Aguilar, L. (2007). *Gender and climate change: Women as agents of change*. Climate change briefing', The World Conservation Union (IUCN).

Angula, M. (2012). *Gender and climate change*: *Namibia case study*. Cape Town, South Africa: Heinrich Boll foundation Southern Africa. Available at: http://www.boell.org.za/downloads/Namibia.pdf (Accessed 17 Aug 2011)

Angula, M. (2010). *Gender and climate change: Namibia case study*. Cape Town: Heinrich Böll Stiftung - Southern Africa.

Ambunda, L., & de Klerk, S. (2008). Women and customs in Namibia: A research overview. In Ruppel, O. C. (Ed.). *Women and custom in Namibia: Cultural practice versus gender equality.* Windhoek, Namibia: Macmillan Education Namibia.

Anderson, C. (2009). Gendered dimensions of disaster risk management, natural resource management and climate change adaptation in the Pacific'. The SPC Women in Fisherie Information Bulletin. 20. Accessible at: <http://www.spc.int/Coastfish/News/WIF/WIF20/WIF20_03_Anderson.pdf>.

Arbache, J.S., Kolev, A. & Filipiak, E. (Eds.). (2010). *Gender disparities in Africa's labour market*. Washington, DC: Library of Congress.

Annecke, W. (2002). Climate change, energy-related activities and the likely social impacts on women in Africa. *International Journal of Global Environmental Issues, 2* (3/4), 206-222.

Aoyagi, M., Suda, E. & Shinada, T. (2011). *Gender inclusion in climate change adaptation*. ADBI Working Paper 309.http://ssrn.com/abstract=1926494 or http://dx.doi.orgS.

Arora-Jonsson, S. (2011). Virtue and vulnerability: Discourses on women, gender and climate change. *Global Environmental Change, 21* (2), 744-751.

Babbie, E. & Mouton, J. (2012). The *practice of social research*. Cape Town, South Africa: Oxford University Press.

Babugura, A. (2010). Gender and climate change: South Africa case study. Cape Town, South Africa: Heinrich Boll Foundation Southern Africa. Available at: http://www.boell.de/downloads/ecology/south_africa.pdf.

Banda, K. (2005). *Climate change, gender and livelihoods in Limpopo Province*: *Assessing impact of climate change, gender and biodiversity in Bahlabela District, Limpopo Province.* Johannesburg, South Africa: University of Witwatersrand.

Baten, M.A. & Khan, N.A. (2010). *Gender issues in climate change discourse*: *Theory versus reality*. Unnayan Onneshan, Dhaka.

Berg, L & Lune, H. (2013). *Qualitative research methods for the social sciences*. (8*th* ed.) UK: Pearson Education.

Biskup, J.L. & Boellstorff, D.L. (1995). *The effects of a long-term drought on the economic roles of Hacendado and Ejidatario women in a Mexican Ejido*. Nebraska Anthropologist. Paper 80. Available at http://digitalcommons.unl.edu/nebanthro/80 (Accessed 17 Aug 2011)

Boko, M., Niang, I., Nyong, A., Vogel, C., Githeko, A., Medany, M., Osman-Elasha, B., Tabo, R., & Yanda, P. (2007). Africa. Climate Change 2007: 'Impacts, Adaptation and Vulnerability'. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Parry, M.L., Canziani, O.F., Palutikof, J.P., van der Linden P.J., & Hanson, C.E. (Eds.). Cambridge University Press, Cambridge UK, 433-467.

Bradshaw, S. (2004). *Socio-economic impacts of natural disasters*: *A gender analysis*. Santiago, Chile: United Nations. Available at: http://www.eclac.org/mujer/reuniones/conferencia regional/manual.pdf. (Accessed 17August 2011)

Bracking, S and Sachikonye, L (2006). Remittances, Poverty Reduction and the Informalisation of Household Wellbeing in Zimbabwe. GPRG-WPS-045. Manchester, Global Poverty Research Group.

Brody, A., Demetriades, J., & Esplen, E. (2008). *Gender and climate change: Mapping Linkages, A scoping study on knowledge and gaps*. Brighton, BRIDGE, University of Sussex.

Brooks, N. Climate change, drought and pastoralism in the Sahel. Discussion note for the world Initiative on Sustainable Pastoralism. Available on line: http//cmsdata.iucn.org/downloads/e-conference_discusions_not_for_the_world_initiative_sustainable_pastoralism_pdf (accessed on 29 January 2015).

Brown, R. B. (2006). *Doing Your Dissertation in Business and Management*: *The Reality of Research and Writin.*, Sage Publications.

Bruchweiler, S. And Gabathuler, E., 2006. Coping with Drought. Swiss Agency for Development, Centre for Development and Environment, 3008 Bern, Switzerland.

Buechler, S. (2009). Gender, water, and climate change in Sonora, Mexico: Implications for policies and on agricultural income-generation. *Gender and Development, 17* (1), 51-66.

Bruchweiler, S. & Gabathuler, E. (2006). *Coping with drought*. Ben, Switzerland, Swiss Agency for Development, Centre for Development and Environment.

Burns, K. (2007). *Quantitative social research methods.* SAGE Publications

Bye, C.G. (2005). I like to hoe my own row: A Saskatchewan farm woman's notions about work and womanhood during the Great Depression. *Frontiers: A Journal of Women Studies, 26(*3), 135-67. doi: 10.1353/fro.2006.0001.

Canadian International Development Association (2002).*Gender equality and climate change*: *Why consider gender equality when taking action on climate change?* Gatineau, Canada: Canadian International development Association.

Cannon, T. (2002). Gender and climate hazards in Bangladesh. Gender and Development 10 (2), 45-50.

CARE. (2010). Adaption, gender and women's empowerment. Accessible at:<http://www.care.org/sites/default/files/documents/CC-2010-CARE_Gender_Brief.pdf>.

Creswell, J.W. (2014). Research design: Qualitative, quantitative and mixed methods approach methods 94th ed.).Nebraka-Lincoln: Sage Publications.

Dankelman, I. (2008). *Gender, climate change and human security: Lessons from Bangladesh, Ghana and Senegal.* WEDO/ABANTU/ENDA. Available at: http://www.gdnonline.org/resources/WEDO_Gender_CC_Human_Security.pdf. (Accessed 17 Aug 2011)

Davies, S. (2006). *Adaptable livelihoods*. London: Macmillan Press.

Denton, F. (2002). *Climate change vulnerability, impacts, and adaptation: Why does gender matter? Gender and Development 10* (2), 10-20.

Dercon, S. (2002). *'Income risk, coping strategies and safety Nets.* World Institute of Development economics Research, Discussion paper NO 2002/22, United Nations University.

De Vos, A.S Straydom, H.; Fouche, C. B.; Poggenpoel, M. & Schurink, E. W. (1998). *Research at grassroots*: *A primer for caring professions*. Pretoria, South Africa: Van Schaik Publishers.

DFID. (2006). *Reducing the risk of disasters- Helping to achieve sustainable poverty reduction in a vulnerable world*: (Unpublished paper). A DFID policy paper.

Donalek, J.G. & Soldwisch, S. (2004). *Demystifying nursing research: An introduction to qualitative research methods*. Urologic Nursing.

Downing, T.E. 1991. Assessing socioeconomic vulnerability to famine: Frameworks, concepts and adaptations. Research Report. The Alan Shawn Feinstein World Hunger Programme, Brown University, Providence, Rhodes Island.

Dumanski, J, R., Peiretti, J. D. Mcagarry, & Pieri, C.(2006). The paradigm of conservation tillage. *Proc, World Assoc. Soil and Water Conserv,* 1, 58-64.

Dunleavey, M.P. (27 January 2007). *"A Breadwinner Rethinks Gender Roles"*. The New York Times.

Du Plooy-Cilliers, F., Davis, C. & Bezuidenhout, R. (2014). *Research matters.* Cape Town, South Africa: Juta & Company Ltd.

Espenshade, Thomas J. (1 January 1985). "*Marriage Trends in America: Estimates, Implications and Underlying Causes"*. Population and Development Review. **11** (2): 193–245. doi:10.2307/1973487. JSTOR 1973487.

FAO (2002). *The state of food insecurity in the world: Food insecurity – when people must live with hunger and fear of starvation.* Rome:Food and Agriculture Organization.

FAO. (2012). Training guide gender and climate change research in agriculture and food security for rural development. Food and Agriculture Organization of the United Nations.

Fossey, E. Harvey, C McDermott, F., & Davidson, L. (2002). Understanding and evaluating qualitative research. *Australian and New Zealand Journal of Psychiatry, 36*, 717 - 732

Gallopin, G.C. (2006). Linkages between vulnerability, resilience and adaptive capacity. *Global Environmental Change 16*, 293-303.

Government of the Republic of Namibia. (1996). *Married Persons Equality Act 1.* (1996). Windhoek, Namibia: Government of the Republic of Namibia.

Hannan, C. (2011). *An overview of women, gender and climate change issues*. Education International's World Conference "On the Move for Equality", Bangkok, 20-23 January 2011. Available at: http://download.ie.org/Docs/WebDepot/21.2.6%20women%20and%20climate%20-%20presentation.pdf. (Accessed 9 April 2012).

Hawke, Lucy (2007). *"Gender Roles Within the American Marriage: Are They Really Changing?"*. *ESSAI*.

Heyns, P., Coetzee, M., Hoffmann, K-H., Mendelsohn, J., Schneider, G., & Seimons, W., (2011). *Groundwater in Namibia: An explanation to the hydrogeological map*. Windhoek, Namibia: MAWF. IPCC.

Hoddinott, J., & Kinsey, B. (2000). *Adult health in the time of drought*. IFPRI FCND discussion paper no. 79. Washington, D.C.: International Food Policy Research Institute. Available at: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.58.2799&rep=rep1&type=pdf. (Accessed 17 Aug 2011).

Holloway, I. & Wheeler, S. (1996). *Qualitative research for nurses*. London, Great Britain: MPG Books.

Holloway, A. (2003). Disaster risk reduction in Southern Africa: Hot rhetoric, cold reality. *African Security Review*, 12, (1)201, .

Hulme,M. Mearns, L.O. Carter, T.R. Leemans, R. Whetton, P. Mata, L.J. and Zillman, J. (2012). Livelihood and climate change: Combining disaster risk reduction, natural resource management and climate change adaptation in a new approach to the reduction of vulnerability and poverty. Conceptual framework paper by the Task Force on climate change, vulnerable communities and adaptation.

Iipinge, E.M., & LeBeau, D. (2005). *Beyond inequalities: Women in Namibia*. Windhoek and Harare: UNAM/SARDC.

Iipinge, E.M. & Williams, M. (2000). Gender and development. Windhoek, Namibia: John Meinert Printing.

IPCC. (2007). Climate Change 2007: The Physical Science basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Solomon, S., Qin, D., Manning, M., Chen, Z., Marquis, M., Averyt, K.B., Tignor, M., Miller, H.L. (Eds). Cambridge University Press, Cambridge and New York, 996 pp.

IPCC. (2007). Summary for policy makers: The physical science basis. Climate change. Cambridge: Cambridge University Press. IPCC. (2014). Summary for policy makers: Synthesis report. Climate change. Accessible at: .

Itemba, D. K. (2013). A Report on women's participation and climate change adaptation in Kilimanjaro Region, Tanzania. Tanzania: Women research foundation.Johnsson-Lathan, G. (2007). *A study on gender equality as a prerequisite for sustainable development.* Sweden: A report to the Environment Advisory Council.

Jungehülsing, J. (2010). *Women who go, women who stay: Reactions to climate change. A case study on migration and gender in Chiapas*. Heinrich Böll Stiftung, Mexico, Central America and the Caribbean. Available at: http://www.boell.org.za/downloads/MIGRACION_Gender_Climate_Mexico_Singles.pdf. (Accessed 17 Aug 2011)

Kasperson, R.E. & Kasperson, J.X. (2001). *Climate change, vulnerability and social justice*. Stockhol, Sweden: Stockholm Environment Institute.

Kaspar, H. (2006). “I am the head of the household now”: The Impacts of Outmigration for Labour on Gender Hierarchies in Nepal. In: Premchander S, Müller C, editors. Gender and Sustainable Development: Case Studies from NCCR North-South. Bern: NCCR North South, pp. 285-303

Krefting, L. (1991). Rigor in qualitative research: The assessment of trustworthiness. *The American journal of occupational therapy*, *45*(03), 214-222.

Kristjanson, *P. et al*. (2010). Livestock and women’s livelihoods: A review of the recent evidence. Nairobi, Kenya: International Livestock Research Institute. Available at: http://mahider.ilri.org/bitstream/handle/10568/3017/Discussion_Paper20.pdf;jsessionid=D13DF8A644B0805530DEF2285B76BAA0?sequence=2. (Accessed 17 Aug 2011)

Kuvare, U., Maharero, T., & Kamupingene, G. (2008). *Research on farming systems change to enable adaptation to climate change. Undertaken for the Ministry of Environment and Tourism and the United Nations Development Namibia, in preparation of Namibia’s Second National Communication to the United Nations Framework Convention on Climate Change.*

Leduc, B. (2008*). Case study: Gender and climate change in the Hindu Kush Himalayas of Nepal. WEDO Gender and Climate Change Workshop in Dakar, Senegal, June 2008*. Available at: http://www.wedo.org/wp-content/uploads/nepalcasestudy.pdf. (Accessed 17 Aug 2011)

Leedy, P.D. (1997). *Practical research: Planning and design*. (6th ed.). Columbus, Ohio: Prentice Hall Inc.

Lopi, B. (2004). *Gender and poverty in the context of human development, health, education and the MDGs*. Paper presented to the Commission for Africa - Southern Africa Consultation, Lusaka.

Marlow, C. (1998). *Research methods for generalist social work.* : Brooks/Cole Publishing Company.

Masika, R., (2002), Editorial, in, 'Gender, Development and Climate Change', in., Oxfam Gender and Development Journal, edited by Masika, R.E.D. Volume 10 Issue 2 2002, UK: Oxfam, http://www.oxfam.org.uk/resources/downloads/FOG_Climate_15.pdf (accessed: 10 August, 2011).

Meena, R. (1992). Gender research/studies in southern Africa: An overview. In Meena, R. (Ed.) *Gender in Southern Africa: Conceptual and Theoretical Issues*. Harare:SAPES Books.

Midgley, G., Hughes, G., Thuiller, W., Drew, G. & Foden, W. (2005). *Assessment of potential climate change impacts on Namibia's floristic diversity, ecosystem structure and function*. Cape Town, South africa: South African National Biodiversity Institute, Kirstenbosch.

Mitchell, T., Tanner, T., & Lussier, K. (2007). *We know what we need: South Asian women speak out on climate change adaptation.* Brighton: ActionAid and Institute of Development Studies (IDS) at the University of Sussex.

Moosa, C.S., & N. Tuana. (2014). "Mapping a research agenda concerning gender and climate change: A review of the literature. *Hypatia,* 29, (3), 677- 94. doi: 10.1111/hypa.12085.

Mupangwa, W., Twomlow, S., & Walker, S. (2008). Conservation tillage for soil water management in the semi-arid Southern Zimbabwe. *Journal of Physics and Chemistry of the Earth, 33*, in press.

National Planning Commission. (2007). *Oshikoto regional poverty profile, main report*. Windhoek: National Planning Commission.

Nhemachena, C., & Hassan, R. (2008). Determinants of climate adaptation strategies of African farmers: Multinomial choice analysis. *African Journal of Agricultural and resource Economics 2,* 83-104.

Nelson, V., & Stathers, T. (2009). Resilience, power, culture, and climate: A case study from semi-arid Tanzania, and new research directions. *Gender and Development 17*, (1), 81-94.

Nelson, V. (2011). Gender, generations, social protection & climate change. UK: Overseas Development Institute.

Nellemann, C., Verma, R., & Hislop, L. (Eds). (2011). *Women at the frontline of climate change: Gender risks and hopes. A rapid response assessment*. United Nations Environment, GRID-Arendal.

Newman, E. (2007). Human Security, University of Birmingham, UK. OCHA, (2011). UN, Office of the Resident Coordinator, Namibia-Floods, Situation Report 1 – 30 March 2011. Windhoek, Namibia.

Neuman, W. L. (2011). *Social research methods: Qualitative and quantitative approaches (*6th ed). Boston, MA: Perason Education, Inc.

Neuman, W. L. (1997). *Social research methods: Qualitative and quantitative approaches*. London: Allyn & Bacon.

Ndlovu, S (1993). Managing Natural Disasters: the role of non-governmental organizations. Paper presented at the Annual General Meeting: Christian Care, Mutare, 25 November 1993

Ndlovu, S. (2010). Coping with drought: Research findings from Bulilima and Mangwe Districts, Matabeleland South, Zimbabwe. Practical action. [Electronic]. Available: http://www.preventionweb.net/ [2011, March 13].

Masika, R. (2002). Gender, development, and climate change. UK: Oxfam.

Maskrey, A and Pelling, M., (2004). Vision of Risk. A review of International Indicators of Disaster Risk and its Management (International Strategy for Disaster Reduction publication).

O'Brien, K., Eriksen, S., Schjolden, A., & Nygaard, L. (2004). *What's in a word? Conflicting interpretations of vulnerability in climate change research*. CICERO Working Paper 2004:04. Oslo, CICERO.

Okali, C. & Næss, L. O. (2013). *Making sense of gender, climate change and agriculture in sub-Saharan Africa: Creating gender-responsive climate adaptation policy*. Accessible at:.

Oxfam International (2008). *Survival of the fittest: Pastoralism and climate change in East Africa, briefing paper. Retrieved from:* http://www.oxfam.org/sites/www.oxfam.org/files/bp116-pastoralism-climate-change-eafrica-0808.pdf .

Parahoo, M., Lewis, P. & Thornhill, A. (2012). *Research methods for business students.* (6th ed.), Pearson Education Limited.

Patrick, E., 2003. Drought: Vulnerability and Crisis in Dry lands. Dry land development Centre, UN Development Program. Available at www.undp.org/seed/unso/aboutus/ddc.htm (Accessed 19-05-2009).

Polit, R. (2008). *Marketing research*: *Text and Cases,* (3rd ed.)

Punch, K.F. (2014). *Introduction to social research: Quantitative and qualitative approaches.* (3rd ed.). Thousand Oaks: SAGE Publications.

Ravera, F., Tarraso, D., & Simelton, E. (2011). Envisioning adaptive strategies to change: Participatory scenarios for agropastoral semiarid systems in Nicaragua. *Ecology and Society 16, 20.* Retrieved from:h *http://www.ecologyandsociety.org/vol16/iss1/art20/*

Reinsch, S. (2009). 'A part of me had left': Learning from women farmers in Canada about disaster stress." pp. 152-1-64. In E. Enarson and P.G.D. Chakrabarti (Eds.), *Women, gender and disaster: Global issues and initiatives.* New Delhi, India: Sage Publications.

Republic of Namibia. (2002). *Initial national communication of the Republic of Namibia to the United Nations framework convention on climate change.* Windhoek, Namibia: Republic of Namibia.

Selvarajan, S., Roy, B.C., and Mruthyunjaya, (2002). Use of Vulnerability Indices for Agriculture. National Centre for Agricultural Economics and Policy Research (ICAR), Library Avenue, Pusa, New Delhi.

Sophia, D, (2013). Household security assessment, Namibia Red Cross Society. Namibia

Sweet, J. (2008). Livestock-coping with drought: Namibia - A case study. Tsumeb, Namibia: Northern Regions Livestock Development Project.

Quisumbing, A.R., & Maluccio, J. (2003). Resources at marriage and intra household allocation: Evidence from Bangladesh, Ethiopia, Indonesia, and South Africa. *Oxford Bulletin of Economics and Statistic, 65* (3), 283-328. Available at: http://www.ifpri.org/sites/default/files/publications/fcnbr84.pdf. (Accessed 17 Aug 2011)

Roncoli, C., Ingram, K., & Kirshen, P. (2001). The costs and risks of coping with drought: Livelihood impacts and farmers' responses in Burkina Faso. *Climate Research 19* (2), 119-132. Available at: http://www.int-res.com/articles/cr/19/c019p119.pdf. (Accessed 17 Aug 2011)

Shaw, R. et al. (2008). *Drought-management considerations for climate-change adaptation: Focus on the Mekong region*. International Environment and Disaster Management (IEDM) and Oxfam, Vietnam. Available at:

http://www.oxfam.org.uk/resources/policy/climate_change/downloads/vietnam_climate_change_report.pdf. (Accessed 17 Aug 2011)

Shank, G. (2002). *Qualitative research: A personal skills approach*. New Jersey, NJ.: Merril Prentice Hall.

Starkey, P. H. (1995). Genetic requirement for drought cattle: experience in Africa, pp 109-114. In J.W. Copland (Ed). Drought animal power for production. Proc, international workshop held at James Cook University Townsville, Qld, Australia 10-16 July 1985. *ACIAR Proceedings Series 10, Australian Center for International Agricultural Research, Camberra. 170p*. (E).

Strauss, A. & Corbin, J. (1998). *Basics of qualitative research*: *Techniques and procedures for developing grounded theory*. Thousand Oaks: SAGE Publications

Streubert, P. & Carpenter, J. (2009). *Research methodology*. (3rd ed.). Cape Town, South Africa: Oxford University Press.

Sarantakos, S. (2013). *Social research.* (4thed.). Cape Town, South Africa: Palgrave Macmillan.

Sweet, R.J. (1998). *Guidelines for livestock development and sustainable range management in NOLIDEP pilot communities*. Windhoek, Namibia: Northern Regions Livestock Development Project (NOLIDEP).

Terry, G. (2009). No climate justice without gender justice: An overview of the issues. *Gender and Development, 17*(1): 5-18.

The World Bank (2007): The Poverty Impacts of Climate Change: A Review of the Evidence. Policy Research Working Paper [online] WPS5622: 2, URL:

http://wwwwds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2011/04/04/000158349_20110404100435/Rendered/PDF/WPS5622.pdf [accessed 17 March 2012].

Tutty, L.M., Rothery, M.A., & Grinnell, R.M. (1996). *Qualitative research for social workers*. London: Allyn & Bacon.

UNEP. (2010). *Too much, too little water: Adaptation to climate change in the Hindu Kush-Himalayas and Central Asia*. United Nations Environment , GRID-Arendal. http://www.grida.no/publications/too-much-too-little-water/ (Accessed 03 October 2011)

UNFCCC (2002). The state of food insecurity in the world: *Food insecurity- when people must live with hunger and fear of starvation.* Rome, Food and Agriculture Organization.

UN Women_Watch: The UN Internet Gateway on Gender Equality. (n.d.). *Women, gender equality and climate change fact sheet.*

UN Women Watch. (2009). Fact Sheet: Women, Gender quality and Climate Change, http://www.un.org/womenwatch/feature/climate change/(Accessed 3October 2011).

Upadhyaya, S.K., T. H. Williams, L, J. Energy requirement for chiselling in coastal plain soils. *Transactions of the ASAE, 27*(6), 1643-1649.

Verma, R. (Forthcoming). *'Mainstreaming' or evaporation?: Reflections and challenges for gender sensitive change in International development, working conference paper, Bhutan+10:Gender and Sustainable Development in a Changing World*. International Centre for Integrated Mountain Development (ICIMOD), Kathmandu, Nepal.

Wamukonya, N., & Rukato, H. (2001). *Climate change implications for Southern Africa: A gendered perspective.* Cape Town, South Africa: Minerals and Energy Policy Centre.

Watson, E. (2006). *Gender and natural resources management*. Cambridge: University of Cambridge.

Yegidis, B.L., & Weinbach, R.W. (1996). *Research methods for social workers*. (2nd ed.). London: Allyn & Bacon.

ANNEX A

Farmers 'Gendered adaptation to droughts in Olukonda Constituency, in Oshikoto Region.

This survey is undertaken for academic (research) reasons. My name is Rosida Pelema, a student of the University of Namibia (UNAM). I am doing a Master's Degree in Gender Development studies, within the Faculty of Humanities and Social Sciences, Department of Sociology.

The reason for my focus on this area is prompted by the recurrent droughts in the northern part of Namibia. Being a student of Gender Studies, I am keen to find out how men and women are adapting to the 2013, 2014, 2015 and 2016 droughts, in Olukonda constituency, hoping that my findings will help improve the droughts effects.

Your participation in this study is voluntary and you are free to remove yourself from the proceedings at any time. It is not compulsory to provide your name and even if your name is provided it will not be mentioned anywhere in the study. Your name will not be recorded or mentioned anywhere in the thesis. There will be no information that will link you to the information which you will be providing. The information you are providing will be kept confidential.

Thank you very much for your participation.

Rosida Pelema

UNAM Student

PREDETERMINED QUESTIONS FOR THE LOCAL RESIDENTS OF OLUKONDA CONSTITUENCY

Name (Not Compulsory):

.....

Age: .....

Gender: (Tick where appropriate) Female ☐ Male ☐

Nationality, are you a Namibian? (Tick where appropriate) YES ☐ NO ☐

Others:.....

Date: .....

1. How long have you lived in this community?

   .....

2. How would you describe the past 3 years rainy season?

   .....

   .....

   .....

3. Are you aware of the 2013, 2014, 2015 and 2016 droughts? (Tick where appropriate)

   Yes ☐ No ☐ Not sure ☐

4. How would you describe 2013, 2014, 2015 and 2016 droughts?

   .....

   .....

   .....

5. Would you say that Olukonda is one of the constituencies that have been

   vulnerable to 2013, 2014, 2015 and 2016 droughts? (Tick where appropriate)

   Yes ☐ No ☐ Not sure ☐

6. How many years have you experienced the 2013, 2014, 2015 and 2016 droughts?

   .....

   .....

   .....

7. How was the 2013, 2014, 2015 and 2016 droughts effects in the past?

.....

.....

.....

8. What has change today in terms of droughts?

.....

.....

.....

9. What do you think are the reasons for the 2013, 2014, 2015 and 2016 drought or the causes of the 2013, 2014, 2015 and 2016 drought in Olukonda?

.....

.....

.....

4. How does the 2013, 2014, 2015 and 2016 drought impact on the basic food security of the inhabitants of Olukonda?

.....

.....

.....

5. Are there any lives lost, and if so, how?

.....

.....

.....

6. How do men and women adapt to the 2013, 2014, 2015 and 2016 droughts?

.....

.....

.....

7. Are people adapting better today than in the past?

.....

.....

.....

8. What has caused the changes in the way people cope with the 2013, 2014, 2015 and 2016 droughts?

.....

.....

.....

9. What are the existing challenges that affect men and women's ability to cope and adapt to the 2013, 2014, 2015 and 2016 droughts?

.....

.....

.....

11. What are your main livelihood strategies to adapt with the 2013, 2014, 2015 and 2016 droughts?

.....

.....

.....

12. What other livelihood strategies are used to adapt to the 2013, 2014, 2015 and 2016 droughts and what are their contributions?

.....

.....

.....

13. Who is most vulnerable to the 2013, 2014, 2015 and 2016 droughts in your community?

Men ☐

Female ☐

.....

.....

.....

14. What makes men and women vulnerable to the 2013, 2014, 2015 and 2016 droughts?

.....

.....

.....

15. What are the social networks to help men and women adapt to the 2013, 2014, and 2016 droughts?

.....

.....

.....

16. What would be the best way to empower men and women to adapt droughts?

.....

.....

.....

17. What would be the best way to empower men and women to adapt to the 2013, 2014, 2015 and 2016 droughts?

.....

.....

.....

18. What kind of household activities are men and women involved in during the 2013, 2014, 2015 and 2016 droughts?

.....

.....

.....

19. What is the status attached to this activities?

.....

.....

.....

20. How much time is spent on each activity?

.....

.....

.....

21.

Drought impacts	Tick or cross here as appropriate
Decreased crop supply	
Food insecurity	
Lack of water	
Loss of livestock	
Economic loss	
Others	

If others, please specify

.....

.....

.....

PREDETERMINED QUESTIONS FOR THE FOCUS GROUPS OF OLUKONDA CONSTITUENCY

1. Has there been any change in the amount and duration of rainfall in the 2013, 2014, 2015 and 2016 in your community?

   ……

   ……

   …….....

2. What do you know about the 2013, 2014, 2015 and 2016 droughts?

   .....

   .....

   .....

3. What is your understanding about the 2013, 2014, 2015 and 2016 droughts?

   .....

   .....

   .....

4. How does the 2013, 2014, 2015 and 2016 droughts affect your community?

   .....

   .....

   .....

5. Has there been any change in the quality and quantity of the crops harvested over the past 4 years?

   .....

   .....

   .....

6. Has there been a change in the number of livestock over the past four years?

   .....

   .....

   .....

7. Has there been any change in grazing: reduced grazing area, increased number of livestock, and lack of grass cover? Can these be attributed to the 2013, 2014, 2015 and 2016 droughts?

   .....

   .....

   .....

8. How do they affect food security and livelihoods?

   .....

   .....

   .....

9. How did the 2013, 2014, 2015 and 2016 droughts make agricultural production difficult and also affect household livelihoods (access to natural resources)?

.....

.....

.....

10. What is done to prepare for and adapt with the 2013, 2014, 2015 and 2016 droughts?

.....

.....

.....

11. How did each household and the community adapt to the 2013, 2014, 2015 and 2016 droughts?

.....

.....

.....

12. What are the main livelihood strategies to adapt to the 2013, 2014, 2015 and 2016 droughts?

……

……

……

13. What will individuals; households and the community do if:

- Drought becomes more frequent

.....

.....

.....

- Changes in growing seasons (shorter growing season)

.....

.....

.....

- Shortage of water

.....

.....

.....

- Areas suitable for crop production becomes less

.....

.....

.....

- Areas suitable for grazing becomes less

.....

.....

.....

14. What other livelihood strategies are used and what is their contribution?

.....

.....

.....

15. What norms, beliefs, laws and programmes (local and national) make dealing with the 2013, 2014, 2015 and 2016 droughts more difficult and reduce ability to adapt?

.....

.....

.....

16. What social structures (e.g. social networks) help the community to adapt and deal with the 2013, 2014, 2015 and 2016 droughts?

.....

.....

.....

17. What natural resources and services help individuals, households and the community adapt well with the 2013, 2014, 2015 and 2016 droughts?

.....

.....

.....

18. During the 2013, 2014, 2015 droughts are there natural resources (Mopani worms, thatch, indigenous Fruits etc) that become more abundant and contribute towards household livelihoods?

.....

.....

.....

19. What would you like to see happen that will help women and men cope better and adapt to the 2013, 2014, 2015 and 2016 droughts?

.....

.....

.....

20. What adaptation options can be developed and implemented to lower risk and vulnerability to the 2013, 2014, 2015 and 2016 droughts?

.....

.....

.....

21. What kind of policies or programmes do you think would be effective in reducing vulnerability of women and men to the 2013, 2014, 2015 and 2016 droughts?

.....

.....

.....

22. Are there any specific needs you feel should be addressed urgently in order to build the coping and adaptive capacity of women and men?

.....

.....

.....

23. What kind of activities are women and men involved in?

.....

.....

.....

24. What is the status attached to each activity?

.....

.....

.....

25. How much time is used in each activity?

.....

.....

.....

26. Who makes decisions on activities at the household level?

.....

.....

.....

27. Who has land rights in the community?

.....

.....

.....

28. What are the major land uses within the community?

.....

.....

.....

29. How (and who) is land allocated in the community?

.....

.....

.....

30. Do men and women have equal opportunity to own or inherit land? How?

.....

.....

.....

31. What is the process of decision making and how do women participate in this process?

.....

.....

.....

32. How far do the community/ individuals travel to collect fuel wood, water, fruits and edibles, thatch, and household construction materials?

.....

.....

.....

33. How have women and men's agricultural practices changed over the years, if at all?

.....

.....

.....

34. What agricultural products are produced in the community?

.....

.....

.....

35. Is there a market for local products and produce?

.....

.....

.....