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**FACULTY OF ARTS**

**DEPARTMENT OF DEVELOPMENT STUDIES**

**THE EFFECTS OF CLIMATE CHANGE ON WOMEN IN GURUVE DISTRICT**

**BY**

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*Submitted to the Department of Development Studies in partial fulfillment of the requirements of the Bachelor of Arts in Development Studies Honors Degree*

**DECLARATION**

I Melody V Mudzimurega registration number R135845F, hereby solemnly declare that this research is my own piece of work and is not a production of someone else's effort, unless where otherwise acknowledged.

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## **DEDICATION**

I dedicate this piece of work to my lovely and caring parents Mr I and Ms D Mudzimurega for their love and financial support. Mum, dad, thank you for believing in me, you never gave up on me. To my love and best friend Edward Shekede who has been my pillar of strength thank you for being there when I needed you the most.

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## ABSTRACT

*The thrust of this study was to examine the effects of climate change on women in Guruve district ward 20. Purposive sampling under qualitative research was used to collect data from the targeted population which was women, Agricultural extension officers, the village head and the general populace. Interviews, focused group discussions and observations were the instruments used to collect the data. The researcher found out that climate change has disproportionately affected people in the community with women being mostly affected. This was due to their dependency on natural local resources, limited access to land, lack of information on climate change, reproductive role burden and lack of collateral to secure loans. The research also reveals that climate change affects the attainment of Sustainable Development Goals (SDGs) as it affects food security. Climate change has also exacerbated the gender disparities. Therefore there is need for economic empowerment of women because they are the most affected and there is need for gender analyses in all climate change policies, programs, projects and budgets. This helps in creating gender sensitive policies. NGOs should complement the government in empowering women in climate change coping and adaptation strategies. Recommendations to address the effects of climate change in ward 20 includes growing of drought resistant crops, land ownership by women, involvement in decision making and practicing of off-farm activities so as to generate income rather than relying on agriculture alone.*

## **ACRONYMS**

FAO	Food and Agriculture Organisation
FDGs	Focused group discussions
GOZ	Government of Zimbabwe
IPCC	International Governmental Panel on Climate Change
NGOs	Non-Governmental Organisation
SAT	Sustainable Agricultural Trust
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
ZIMSTAT	Zimbabwe National Statistics Agency



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# CHAPTER 1

## PROBLEM AND ITS SETTINGS

### 1.0 Introduction

This chapter presents the problem and its settings. This includes, the background of the study whereby the researcher will give an overview of climate change giving evidence of its existence and how women will be affected and what makes them more susceptible to the vagaries of climate change basing on scholarly views. The statement of the problem will also be noted in this chapter in which the researcher will reveal the problem she intends to solve. The study will also explore the theory that will be employed to this study under theoretical framework, conceptualization of key terms and causes of climate change will also be articulated. More so, this chapter will highlight the research questions and objectives as well as the significance of the study. Therefore all the above mentioned will be elaborated further in the discussion to follow.

### 1.1 Background of the Study

Detrimental effects of climate change are being felt globally and they have exacerbated poverty in developing countries. MacCathy (2001) noted that scientist have agreed that anthropogenic activities that leads to greenhouse gas emissions are increasing global surface temperatures and affecting the earth's climate. These activities include transport, agriculture and provision of energy (IPCC, 2013). Skynews (2013) stated that, in Europe, there has been an increase in temperature in regions within the Arctic such as Alaska and Canada along with a decrease in rainfall in countries such as Spain and an increase in rainfall in the Northern region of Europe, as well as a shift in rainfall patterns where environmentalist have observed a decrease in precipitation in the southern regions and an increase in precipitation in the Northern parts of

Europe. Satellite observations show that the arctic sea is declining at a rate of 11.5% per decade (EEA, 2012). According to the United Nations report on disasters (2008), 87% of disasters in the past 10 years have been climate related.

Africa is considered to be vulnerable to climate variability due to its dependency on rain-fed agriculture, high temperatures, reduced precipitation as well as poverty (Ziervogel, et al.2008, Toulmin, 2009). It is estimated that rain-fed agriculture will decrease by 50% by the year 2080 and in Zimbabwe rain-fed agricultural production will decrease by 50% by the year 2020 (IPCC, 2012). Rainfall levels are also expected to decline by 60% by the year 2080 and the reproductive role burden for women of fetching water will increase drastically by six folds (Rosen and Vincent, 1999). According to ZimStat (2012), population census report Zimbabwe has a population of 12 973 808 of which 68.6% resides in rural areas. Therefore, women who make up 65% of the world are poor (UNDP, 2010) and will suffer more as a result of climate change.

Women have been denied equal access to land and yet they are the ones who contribute more to agricultural production. Chanaka (2014) notes that, women are disproportionately affected by climate change impacts than men especially as it relates to agriculture and food security, water resources, human health, women settlements, migration, energy, transport and industry. According to the United Nations Watch, women constitute the majority of the poor and are largely dependent on natural resources for their livelihoods. Apart from that, women face social, political and economic barriers that naturally affect their coping capacity. In cases of disasters women have to fetch water and secure food and fuel for cooking. Women account for more than 90% of food production in many African countries and climate change affects food availability, accessibility and utilization. Women therefore face loss of income and low food productivity and at times this translates to increase in food prices which affects the poor, in particular women.

Furthermore, increase in women tasks due to climate change results in women having less time to do their household chores, engage in social and political activities, and learn to read and write, acquire other skills resulting in failure to rest adequately (UNDP, 2013). Women's movement in search of basic commodities also exposes them to sexual abuse such as rape. Therefore this study will focus on rural women in Guruve district, exposing the vagaries of climate change on their livelihoods.

## **1.2 Statement of Problem**

The issue of concern is why despite the efforts made by the government and NGOs to address the issue of climate change, women still suffers more than men and what could be possibly done to address this disparity. More so, the study will also suggest coping and adaptation mechanisms to rural women in Guruve which will sustain them since it is projected that by 2020 Zimbabwe's agricultural production will decrease by 50% (IPCC, 2012).

## **1.3 Theoretical framework**

Eco-feminism theory which was propounded by Rosemary et. al. (1975) is going to be employed. The theory states that women and nature are one and they depend more on the environment for their socio-economic sustenance. The theory also believes that capitalism is to blame for environmental degradation since capitalism is the root cause of women's oppression. To this end women are more concerned with the preservation and conservation of the environment whilst men on the other hand are more concerned with expropriating environmental resources for capital gain. Hence women essentially suffer more as a result of the degradation of the environment.

## **1.4 Conceptual framework**

### **1.4.1 Climate**

Climate is how the atmospheric weather behaves over a relatively long period of time. It is the average prevailing condition of the weather at a place usually over a period of years as evidenced by temperature, wind velocity and direction, precipitation among others (IPCC, 2007). Zimbabwe's National Climate Change Response Strategy defines climate as a composite measure of the average pattern of variation in temperature, humidity, precipitation, wind, atmospheric pressure, sunshine, atmospheric particle count and other meteorological variables in a region over a long period of time (usually 30 years).

### **1.4.2 Climate variability**

Several scientists have agreed that climate variability is the way in which climate fluctuates yearly above or below a long-term average value. Nicholson (1987) views climate variability as the dissimilarity between long term statistics of meteorological elements that are calculated for different periods. Therefore climate variability can be defined as the shorter term that is seasonal or annual variations in climate. It differs with climate change in that climate change is seen over a long period of time for instance a decade unlike climate variability which is noted early that is annually or seasonally. Climate variability affects precipitation patterns, agricultural production and it also shortens seasons thus affecting rural women due to their reliance on local natural resources for their livelihoods.



### **1.4.3 Climate change**

Climate change refers to major changes in temperature, rainfall, snow or wind patterns lasting for decades or longer. UNFCCC (1992) defines climate change as a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods. IPCC defines climate change as a change in the state of the climate that can be identified (eg using statistical test) by changes in the mean and/or variability of its properties and that persist for an extended period, typically decades or longer. According to Oxford English Dictionary, climate change is a change in the earth's weather including changes in temperature, wind patterns and rainfall; especially the increase in the temperature of the earth's atmosphere that is caused by the increase of particular gasses especially carbon dioxide. It is caused by both anthropogenic and natural causes. Anthropogenic activities include burning fossil fuels, deforestation, developing of land for farms, cities and roads. Natural causes are changes in earth's orbit, volcanic activity, the sun's intensity, circulation of the ocean and the atmosphere (UNDP, 2006). Climate change has also resulted in floods, extreme weather patterns, increased incidence of diseases and growing food and water insecurity.

### **1.4.4 Causes of climate change**

#### **➤ Deforestation**

Deforestation refers to the cutting, clearing and removal of rainforest or related ecosystems into less bio-diversity ecosystem such as pasture, cropland or plantations (Kricher, 1997). Rudel (2005) defines it as the clearing of earth's forests on a massive scale, often resulting in damage to the quality of the land. In a report released by the Zimbabwe's forestry commission (2005) the

report figures shows that 20 of 330 000 hectares of natural forest were lost annually. Trees were cut for firewood to cure tobacco and clearing land for agriculture as well as building infrastructure. The United Nations Food and Agriculture Organization (2010) in its global resource assessment listed Zimbabwe among the top 10 countries that recorded the largest forest cover loss between 1990 and 2010. During the clearing of land residues are burnt thus producing greenhouse gases which have a detrimental effect on the environment, hence causing climate change.

➤ **Greenhouse gases**

Greenhouse gases are viewed as the most contributors to climate variability. They are caused by the cutting down of trees as well as burning of fossil fuels. IPCC has it that with the coming of industrial revolution, concentration of carbon in the atmosphere have risen by 35% from burning fuels as well cutting down of trees .The report adds that, if GHGs emissions proceeds temperatures will increase by 1.4°C to 5,8°C which may cause long term effects on rainfall patterns globally. The sad part of this shift in climatic conditions is that the western countries who are the biggest emitters of greenhouse gases suffers less due to their resilience whilst the African states who emits less suffers more to the vagaries of climate change regardless of their level of the pollution. Therefore, this shows that climate change is universal as it affects every nation except for those with the capacities to mitigate it. WWF (2013) pointed out that, greenhouse gases produces carbon dioxide which is a harmful gas of the atmosphere resulting in acidic rainfall.

### **1.5.1 Research objectives**

- To explore the impacts of climate change on women in Guruve district.

- To assess the coping and adaptation measures that has been put in place by the rural women in Guruve district.
- To examine the reason behind the continuous suffering of women to the vagaries of climate change despite the efforts made by NGOs and the government.
- To suggest coping and adaptation measures to rural women.

### **1.5.2 Research Questions**

- Why do women suffer more to the vagaries of climate change than men?
- What is being done by women in Guruve district to cope up and adapt to the impacts of climate change?
- How has the government and NGOs assisted in dealing with effects of climate change on rural women?
- What can be done to address the gender disparities that is being further exacerbated by climate change and what measures can be put in place?

### **1.6 Significance of the study**

The study will be of great importance to a lot of people. These are to be discussed below.

#### **➤ Women**

Women as the targeted population of this study will greatly benefit. Rural women are mostly affected by climate variability due to their lack of adequate knowledge on climate change, Thus through this research the researcher will suggest reliable coping and adaptation measures that will sustain them in the long run since projections on climate change are stipulating that by 2080 most of the rivers in sub-Saharan Africa will dry up and the agricultural production will

decrease. Hence with the findings from this research even NGOs and the government will also have a clue on what are the exact problems that are being encountered by women in Guruve district, as a result they will be able to offer sustainable solutions as they will be aware of the prevailing problems. More so, it is not only women in Guruve district that are going to benefit from this research but women in other parts of the country will also benefit.

➤ **NGOs**

NGOs will be equipped with specific problems that are being faced by women in Guruve district. This will assist them in avoiding poor targeting or rejoblication of projects when it comes to assisting the community. They will also be able to provide the community with aid that is durable and sustainable as they will be aware of the hardships women are experiencing within the community.

➤ **Policy makers**

The study will also be of great significance to policy makers. This is so because they will be aware of the prevailing problems in Guruve district. This makes it easy when they craft their budgets and their aid. They will be able to develop aid that is durable and sustainable. More so they will be equipped with the gender disparities that are being further exacerbated by climate change, thus implementing policies bearing in mind the gendered gap that is being widened by climate variability.

➤ **AGRITEX officers**

AGRITEX officers in Guruve district are going to benefit from this study. Findings of this study will add on to what they have thus coming up with comprehensive coping and mitigation

mechanisms that will help the community at large. This will also assist them in devising educational lectures to their community since they will be fully aware of the specific problem at hand.

### **1.7 chapter breakdown**

Chapter 2 -Literature review

Chapter 3- Research methods

Chapter 4–Data analysis, presentation and discussion

Chapter 5 –Conclusion and recommendations

### **1.8 Chapter summary**

To conclude, the above discussion pointed out the problem and its settings stipulating the background of the study, objectives, theoretical framework, and problem statement as well the significance of the study. The Main aim of this chapter was to give an overview of the research and what the researcher intends to solve in her study.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.0 Introduction.**

This chapter establishes the basis for this research by looking at what other scholars have discovered in their studies on climate change. It provides an analysis on the similarities and differences of ideas suggested by other authors on the research. The chapter identifies some of the effects posed by climate change on rural women as well as coping and adaptation measures they have put in place.

#### **2.1 Scholarly works on climate change.**

Several studies have been carried out on the impacts of climate change but there is little literature to understand the impacts of climate change on rural women. Many scholars have focused on impacts, vulnerability and adaptation and not taking into consideration the fact that the effects of climate change are disproportionately felt depending with regions as well as gender. This is supported by Saanenet. al. (2012) when he stated that, the impact of climate change differs with regions, for example it has been stipulated that while Sub-Saharan countries bear the brunt of climate change, Arctic regions stand to gain positively from climate change with the warming temperatures enabling longer periods for growing crops.

The Institute for Environment and Development (IED) (2012) focused on climate change impacts, vulnerability and adaptation in Zimbabwe. The research showed the effects of climate change on both female and males. The report did not mention that the vagaries of climate change are disproportionately felt and women suffer more than men. Also the report covered the whole

of Zimbabwe whilst effects are felt differently according to vulnerability and the availability of resources to cope and adapt to shocks. IED (2012) reiterated that the adverse impacts of climate change affect the socio-economic sectors as a result of a decline in agricultural production.

Dube and Phiri (2013) emphasized on the impacts of climate change on livelihoods in Matobo district. They stressed that climate change has altered the physical geography of the area leading to a disappearance of flora and fauna and other natural habitat that constituted the livelihoods of the local people. Decline in precipitation levels and rising temperatures has led to food insecurity. The authors did not reveal the effects of climate change on rural women and rather focused on livelihoods, thus there is need for a research on the effects of climate variability on rural women in Guruve district. Nath and Behera (2011) states that local assessment of vulnerability enables us to understand why and how communities respond to the same type of environmental stress in different ways.

Most of the literature on climate change emphasized that women are less able to cope with the negative impacts of climate change. Nevertheless, it seems that there is a gap between the rate at which climate is changing and the response to reduce its impact (Mudzonga, 2011). Challenges that affect women's adaptation strategies in Guruve district are not known. Hence, this study will explore these challenges and suggest some recommendations as well as coping mechanisms for the rural women.

Adding on, Dongodza (2010) focused on women and climate change adaptation in which she stressed that women are among the groups that are vulnerable to the effects of climate change. She focused mainly on women's dominance in agriculture as well as their difficulties in accessing credit, equipment and machinery which are essential for production. As she focuses on

the impacts of climate change as a challenge faced by women and women's access to decision making, she did not mention anything about the effects of climate variability on rural women. Hence the research is of great significance as it will highlight how women were being affected by climate change in Gulu district.

Furthermore, Gletibou (2009) argue that in rural Uganda women suffer more to the effects of climate change. As the primary agricultural producers, women work harder and longer to provide for their families in degraded environments and when weather patterns change, in this sense, a woman's quality of life is deeply degraded. He highlighted that, inside small homes, huts and shacks, they breathe polluted air from biomass outside, women and girls spending as many as 8 hours walking to collect water and firewood. UN Women (2014) in support to Gletibou's point of view argued that women are forced to walk further than ten hours to collect firewood and clean water. He also states that women also suffer emotionally and physically when crops fail as they are unable to feed their families and are subjected to an increase in domestic violence due to frayed tensions in the family home from a lack of food.

Brucho et al (2011) also agreed with this notion and also added that lack of food is devastating for the entire family, yet in many parts of Uganda, lack of women's rights to own land is one that puts women at greater disadvantage to men as they are reliant to each crop succeeding to survive. If men have to sell the land, women are left to fend for themselves. Therefore this study is relevant since the above mentioned research depicts the vagaries of climate change on women in Uganda and this study focused on Zimbabwe.

Moreover, scholars often write about climate change and climate variability impacts on women in general term without looking at a specific area. As a result little has been done to understand



the impacts of climatic variability on women especially in marginalized communities like Guruve. Hence, the main thrust of this study is to conceal this knowledge gap through an in-depth exploration of the effects of climate change on rural women in Guruve. Thus the research has given Guruve women a platform to air out their views about issues affecting them in relation to climate change. This is important because what transpires in a certain area does not also apply another. Taking for instance, the way in which urban women suffer from climate change effects differs from those in rural areas. As a result this knowledge will assist in policy formulation that will enhance the status of rural women.

## **2.2 Global evidence of climate change.**

Climate change has become a global challenge as it has not spared anyone. Its severity is being felt world over and states have held several COPs in trying to come up with solutions to mitigate it. Climate change has resulted in floods, heat waves, hurricanes, water scarcity, food insecurity, health problems, earthquakes, tensions over resources among others. Women have suffered more as a result of these climatic changes. In the Indian Ocean Tsunami, five times as many women as men died and women accounted for 67% of the fatalities (Fordham and Bradshaw, 2013, p12). More so, in the aftermath of the 2010 earthquake in Haiti, camps were overcrowded, lacked adequate sanitary facilities and lighting conditions that led to night attacks on women. Post disaster assessment in Myanmar in 2015 also showed that women and girls had lower recovery capacity since they had low incomes and fewer productive assets, high food insecurity and malnutrition.

Globally, the number of reported climate change disasters is mounting rapidly. Reports of natural catastrophes have more than tripled since the 1960s. In 2007, fourteen out of fifteen flash appeals

for emergency humanitarian assistance were for floods, droughts and storms, five times higher than in any previous year (ibid). Furthermore, it is projected that global warming will result in changes in precipitation patterns, acidification and humidity. Against this background, the overall impact of climate change on global life support systems remains uncertain. Some areas are experiencing extreme rainfalls leading to flooding whilst other areas like the Mediterranean experience a decrease which might result in drought (Rosen and Vincent, 1999). According to IPCC (2012), global mean temperatures are expected to increase between 1.4 and 5.8 °C by the end of this century with a corresponding rise in sea level as glaciers melt. Recent observations however show that many predictions about aspects of climate change are near the upper boundary of IPCC's estimates. Sea levels for instance have increased far above IPCC's projected estimates to 30 cm.

### **2.3 Climate change in Africa.**

Africa has been seriously affected by climate change. It is estimated that rain fed agriculture will decrease by 50% by the year 2080; river flow rates are expected to decrease by 70% by the year 2050 in sub-Saharan Africa (UNFCCC, 2012). These projections are already manifesting as evidenced by floods, change in precipitation rates, food insecurity, heat waves as well environmental degradation. Mozambique has been frequently attacked by floods and this year 2017 it has experienced cyclone Deneo which has extended to some parts of Zimbabwe. These floods has destroyed infrastructure like dams, roads bridges among others. It has also left some citizens homeless in Mozambique and Zimbabwe during the Cyclone Deneo of 2017.

Karukulasuria et. al. (2006) asserts that, an economic analysis of 9000 farmers in 11 African countries predicted falling farm revenues with current climate scenarios and using two global

circulation models, a study at national level in Mali predicted future economic losses and increased risk of hunger due to climate change (Butt et. al., 2005). Adger et. al. (2007), stresses that, it seems clear that the combination of high climatic variability, poor infrastructure, economic poverty, and low productivity will constitute challenges for Africa and the Sahelian countries in particular. As temperature increases and rainfall pattern becomes more unpredictable, crop yields are expected to drop significantly (Ifeanyi-Obi et. al., 2012). Also extreme weather events such as thunderstorms, heavy winds and floods devastate farmlands and can lead to crop failure. Pests and diseases migrate in response to climate changes and variation (ibid). Mowa and Lambi (2006) in Ifeanyi-Obi et. al., (2012) stated that even if there is sufficient rain, its irregularity can affect yields adversely if rain fails to arrive during the crucial growing stage of the crops. Extreme weather patterns have lead to water scarcity which is the main source irrigation during dry season crop production.

IPCC (2007) has it that, rural women in developing countries are one of the most vulnerable groups. This is due to their heavy reliance on natural resources for their livelihoods, do most of the agricultural work and they are the ones responsible for collecting water and firewood. Africa is predicted to be the continent that will be worst affected by climate change mainly because of its global position, its vulnerable populations and its poor land-use practices. There have been prolonged and intensified droughts in eastern Africa, unprecedented floods in western Africa, depletion of rain forests in equatorial Africa, and an increase in ocean acidity around Africa's southern coast (CIGI, 2009). Vastly altered weather patterns and climate extremes threaten agricultural production and food security, health, water and energy security, which in turn undermine Africa's ability to grow and develop.

According to the Zimbabwe's National Climate Change Response Strategy (2012), the warming trend observed in southern Africa over the last few decades is consistent with the global trend of temperature rise in the 1970s, 1980s and 1990s and the timing of periods of most rapid warming has also been similar. It further states that, six warmest years have occurred since 1980, with the period 1986-1995 being the warmest and driest. The temperatures in the southern African region have risen by 0.5°C over the past 100 years and are further expected to increase at a rate of 0.05°C per decade. According to the 4th IPCC Assessment Report, there is already evidence that Africa is warming faster than the global average, and this is likely to continue. The warming occurs all year-round. By 2100, temperature changes will fall into ranges of about 1.4°C to almost 5.8°C increase in mean surface temperature compared to 1990. This warming will be greatest over the interior of semi-arid margins of the Sahara and central southern Africa.

Nhemachena and Hassan (2007) found out that higher summer temperatures have mostly negative effects on net farm revenue. Additionally, projections of future change place southern Africa's agriculture sector at the forefront of climate change vulnerability with potential negative impacts on revenue from dry land farming (Kurukulasuriya et. al., 2006). Hence there is need to assess the capacity of southern African countries to cope with, and adapt to, the impact of climate change.

#### **2.4 Climate change in Zimbabwe.**

Zimbabwe is a land locked country found in southern Africa. Brown et. al (2012) has it that Zimbabwe lies in a semi-arid region with limited and unreliable rainfall patterns and temperature variations. Rainfall exhibits considerable spatial and temporal variability characterized by shifts in the onset of rains, increases in the frequency and intensity of heavy rainfall events, increases

in the proportion of low rainfall years, decreases in low intensity rainfall events, and increases in the frequency and intensity of midseason dry-spells (Unganai, 2009). Zimbabwe has been also experiencing extreme weather events which includes tropical cyclones namely cyclone Eline, Cyclone Dineo which struck mid-February 2017 and has affected almost the entire country through floods, which have washed away bridges and roads and marooned some communities in the southern parts of Zimbabwe entirely (Kapita, 2017). Mukeredzi (2017) postulated that almost 250 people have been killed and nearly 2000 people have been left homeless, while many others remain vulnerable to dams bursting or overflowing upstream. More so, according to the Zimbabwe Meteorological Service, daily minimum temperatures have risen by approximately 2.6°C over the last century while daily maximum temperatures have risen by 2°C during the same period (Brown et. al., 2012).

Climate variability has altered the environment thereby shifting Zimbabwe's five agro-ecological zones or natural regions (Brown et. al., 2012). Taking for example, natural region I has reduced in size, natural region II has shifted further east and natural region III has shifted to the north (Brown et. al., 2012). Chinhoyi and Chibero and their surroundings have shifted from natural region II to natural region III while Kwekwe and its surroundings have shifted from natural region III to natural region IV (Brown et. al., 2012). Brown et al. (2012) went on to say that, the climate in Zimbabwe is regionally differentiated, but is generally becoming warmer with more erratic rainfall patterns. Matarira et. al. (1995) used global climatic models and dynamic crop growth models and established that maize yields decrease dramatically under dry land conditions in some regions sometimes up to 30%, even under irrigation conditions due to temperature increases that shorten the crop growth period.

GoZ (2013) has it that, temperatures has been increasing by 0.1°C per decade. This explains why they are now hotter days and few cold days than in the past. The temperature increase has been most pronounced during the dry season. More rain than the average is occurring at the beginning of the season which has shifted to late November and early December, and less rain than the average is being received between January and March. More dry days have been noticed during the rainy season. The impacts of climate change will mean more work and greater hardship for women and children as they will have to walk further to collect water and firewood and encounter increasing adversity in food production (Manjengwa et. al., 2014). Clean water and fuel for cooking will become increasingly scarce, affecting household hygiene and nutrition and undermining the health of pregnant and breastfeeding women and their children.

The Zimbabwe Department of Meteorological Service pointed out that, the country is now experiencing more hot days and fewer cold days and the amount of precipitation it receives is deviating from the mean more frequently than it used to be before 1950 (Mudzonga, 2011). This shows that climate has changed in the country. The decline in the country's exports also shows that climate change has changed. This is evidenced by the decline in the country's maize export from 51% in 2000 to 13% in 2007 (Mudzonga, 2011). Zimbabwe also experienced a decline in the national maize production in the 1990s due to failure of agriculture. This was due to the changes in precipitation patterns, high temperatures and extreme weather events. As a result agricultural productivity declined thereby leading to food shortages. Mudzonga (2011) went on to say that the failure of agriculture resulted in many people losing their jobs especially women of which the agricultural sector employed 74% of the labor force.

## **2.5 Climate change in Guruve district.**

Guruve district is found in northern Zimbabwe and it has been greatly affected by climate variability due to its reliance on rain fed agriculture. Women have been the most affected group. This is so because of the social set up of the community whereby women do all the household chores which include fetching of water, firewood, taking care of the sick, making sure that the family has eat as well as doing the all the farming activities except for ploughing and selling the farm produce. United Nations Women Watch stresses that 45% to 80% of the food-producing workforce in developing countries are women thus considering this one can note that due to climate variability women's burden is exacerbated.

The shift in the rainfall pattern shows climate change in Guruve district as argued by Chimanikire (2013) that, in the past years people were used to receive early rainfall known locally as the Gukurahundi or bumharutsva in the late August or early September. Nowadays, however, as a result of climate change this is no longer the case the area receives the first rains around December. This view is also supported by one of the respondents to this study who said that the area used to receive three groups of rainfall namely, Bumarutsva (around August and September), Gukurahundi (October) and Munakamwe (November) but this has been altered by climate change the area now only receives Munakamwe which is not predictable. This shift has made some of the farmers to substitute maize crops with sorghum and millet since they require little rainfall and they mature faster than maize. Therefore, the shift in the rainfall patterns is a clear indication that climate has changed in Guruve district.

Adding on, low precipitation rates have led to water scarcity within the district. During summer most boreholes dries up thereby making people rely on dam water which is not safe to drink.

Women and children are forced to walk long distances of about 3km to fetch water. This robs them of their time for education especially the girl child. Women's time to carry other household chores and participation in decision making process is taken away by fetching water. This traveling of long distances has also exposed them to sexual abuse. Water scarcity has also affected women's projects such as vegetable gardens. Women in the district used to grow vegetables and sell them so as to gain income for paying school fees for their children as well as for their household sustenance. Considering this one can note that indeed climate change is and has affected the district thus there is need for a thorough investigation on the impacts such that measures will be put in place.

## **2.6 Adaptation measures**

One needs to understand that there are two basic types of adaptation that is planned adaptation and autonomous adaptation (Smithers and Smit, 2009). According to Chimanikire (2013) autonomous adaptation refers to reaction of farmers to changing precipitation patterns, in that he or she changes crops, uses different harvest and planting or sowing dates. Smithers and Smith (2009) defined planned adaptation measures as conscious policy options or response strategies, often multi-sectorial in nature and aimed at altering the adaptive capacity of the agricultural system of facilitating specific adaptations. Autonomous adaptation is done without awareness of climate change predictions but based on experience and prevailing conditions (Smithers and Smith, 2009).

Maddison (2006) in Ofuoku (2011) stresses that, adaptation to climate change requires farmers to realize that the climate has changed and they must identify useful adaptations and implement them. Bryant et. al. (2008) in Moyo (2012) suggests that the farmers' perceptions on climate



change and variability are important in adaptation as they determine decisions in agricultural planning and management by the farmers. Maddison (2006) further states that, farmers can be influenced by peers' perceptions and values within their community in terms of climate change and variability. Perception of climate is based on economic and social impact it has on personal lives (Slegers, 2008). Hence the farmers' perceptions inform the decision on adaptation.

In a bid to cope and adapt to climate change, people in Guruve district has tried to come up with some strategies. With the aid of the government and NGOs the community is now growing drought resistant crops like sorghum and millet as well as mung beans which were introduced by ENTERPRIZE a Canadian NGO. These measures were not successful due to birds which feed on millet and sorghum. They have also been encouraged to make use of Indigenous Knowledge systems (IKS) such that they will be aware of the amount of rainfall they are likely to receive. In that they will know the type of crops and the time to grow. This coping mechanism has gaps since some homesteads has no elderly people to teach them on how to read weather patterns by just looking at the sky, trees, birds among others.

Most people in the district have substituted maize crops with tobacco on the basis that if they sell their farm produce they will then purchase maize from GMB. This was somehow effective but however, it has led to deforestation in the area. The curing of tobacco requires firewood, thus with almost everyone in the district practicing tobacco farming there has been cutting down of many trees hence deforestation. This has made them susceptible to climate vagaries. AGRITEX has it that around 40% of forest has been lost through the curing of tobacco, hence there is need to for the government to come in and reduce this rapid deforestation. As a result women are the ones who suffer more the brunt of walking 6 to 8 km in the fetching of firewood.

## **2.7 Chapter summary**

From the above information, it can be noted that the researcher reviewed on what other scholars has noted on climate change and women. It has been stipulated that climate change is indeed happening and is affecting everyone globally. Many scholars have generalized the severity of climate change on everyone not bearing in mind that people are affected differently depending with location as well as sex. The researcher however managed to reveal the effects of climate change in Guruve district as well as some of the adaptation measures they have employed.

## CHAPTER 3

### RESEARCH METHODS

#### 3.0 Introduction

This chapter presents the methodological approaches that were used in carrying out this research as well as limitations that the researcher encountered. The researcher employed qualitative research using different data collecting tools such as interviews, participatory observation, and focused group discussions. Secondary sources like electronic journals, text books, newspapers, scholarly articles on climate change also contributed to the compilation of this thesis. Kothari (2004) defines research methodology as a way to systematically solve the research problem and in it one studies the various steps that are generally adopted by a researcher in studying his research problem along with the logic behind them. Hence the mentioned data collecting tools will be elaborated further in the following discussion.

#### 3.1 Research design

Ragin in Uwe (2004) states that, research design is a plan for collecting and analyzing evidence that will make it possible for the investigator to answer whatever questions he or she posed. The researcher used qualitative research design. According to Cresswell (1998), qualitative research is an inquiring process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem. Danzin and Lincoln (2005) describes qualitative research as a method of collecting data in which researchers study information in their way of thinking or interpreting the meaning participants gave to them in other words simple to understand, qualitative research is sometimes known as ethnographic or anthropological study. A common feature of qualitative research is that it aims to create an in depth understanding of a

case as the analysis goes on. Thus, the researcher opted for this method because it provides in-depth information characterized by emotions, observations by the researcher thus removing bias and it is also flexible and based on the multiplicity of reality.

### **3.2 Sampling size**

This research was carried out in Mashonaland central in Guruve district ward 20. The study mainly targeted women. However Campell (1995) stresses that each and every society has the people with more information than others thus the researcher also made use of traditional leaders, AGRITEX officers, village health workers, and the village head.

### **3.3 Sampling**

Punch (1998, p193) stresses that, sampling size is very important because one cannot “study everyone everywhere doing everything”, this simply means that one cannot study the whole population if the targeted group is large. Thus the researcher used purposive sampling since the study is targeting women at large and due to time and credibility of this research the researcher had to hand pick respondents with much knowledge on the subject.

#### **3.3.1 Purposive sampling**

The researcher used purposive sampling because it gives rich information as one will be targeting people with knowledge on the research. Neuman (2000) asserts that, purposive sampling uses judgment of an expert in selecting cases or it selects cases with a specific purpose in mind for example when a researcher wants to identify particular types of cases for in-depth investigation. Berg (1998) goes on to say that purposive sampling is usually used in exploratory research hence the researcher opted this sampling method as it will add on new knowledge to the

existing new literature on climate change and women. Kumar (2005) agrees with the above stating that, this type of research is extremely useful when the researcher want to construct a historical reality, develop a phenomenon or develop something about which only a little is known.

### **3.4 Data collection methods**

Several data collecting methods were used in this research. These methods are grouped into two categories that is primary and secondary data

#### **3.4.1 Primary data**

Primary data is data that has never been recorded. It is collected from its original source, thus enabling the researcher to analyze information basing on the facts that she has proof of. Hence the researcher used interviews, observations and focused group discussions.

#### **3.4.2 Semi-structured interviews**

Semi-structured interviews were employed by the researcher. This is because they give room for one to assess whether the respondent is telling the truth or lying through facial expressions. Welman and Kruger (2001) pointed out that, semi-structured interviews facilitate adaptability of formulation of questions and terminology to suit the interviewee's background and educational level, and they also eliminate a level of rigidity that is common in structured interviews. The researcher used a flexible interview guide so as to leave room for issues raised by the interviewees that would be of particular interest to this research.

Interviews were very useful in collecting data within the district. Through this method the researcher was able to grasp some of the government's and NGOs efforts in dealing with the

effects of climate change on women in Guruve district. I was also able to get an insight on the use of indigenous knowledge systems that were being employed by the community as mitigation strategy to climate change. More so, through interviews the researcher got to talk to AGRITEX officers as well as respected elders in the community who had information on climate change.

### **3.4.3 Focused group discussions**

Modell (2007) Focused group discussions refers to a group of similar respondents who engage in a discussion about a specific topic under the direction of an interviewer. Hence the researcher employed FGDs and each group consisted of 5 people except for one I had with Zimbabwe Apostolic Faith Mission (ZAFM) women. The number was limited so as to limit chaos and confusion during the course of the discussion, thus with 5 people I managed to keep the discussions in control. Schilderman (2002) points out that FGDs brings up the spirit of openness thus sharing the information. Punch (1998) adds that, FGDs stimulate people in making explicit their views, perceptions, motives and reasons and they are also inexpensive, data-rich, flexible, stimulating, recall-aiding, cumulative and elaborative.

I employed this method so as to get a larger population's view on climate change. It was mostly employed on the targeted population that is women. Three groups were identified of which two had five people in each and the other one had 16 people. Several issues were articulated in these discussions including the effectiveness of the donor and government's aid towards the mitigating of the vagaries of climate change. The severity of climate change on women and the community as a whole was also brought out from these FGDs. Through these discussions I also managed to grasp some of the measures that have been put in place by women in adapting to climate change variability.

### **3.4.4 Observations**

Cite observations as a data collecting tool was used so as to gather images of the purported climate change effects such as land degradation, water depletion, loss of livestock as well as mitigation and adaptation measure that have been put in place by women in the community to cope up with the situation. Dawson and Catharine (2002) pointed out that, direct observations are a direct way of data collection, which is first hand visual information, they adds that, it is a study tool of collecting and evaluative data through using your own way of thinking after observing the environment of the study. The researcher carried out the observations in Kachuta, Gombarashama village ward 20. This was to compliment the information from the interviews as well as FGDs. This also helped the researcher to have a deeper understanding of what the people within the area were experiencing. I also observed that most households were female headed and most men had migrated to the neighboring village where they were doing gold panning so as to fend for their families back home.

### **3.5 Secondary data source**

The researcher realizing that she could not solely rely on primary data, she made use of secondary data sources. These include journals, textbooks, internet, newspapers as well as other scholarly articles on the effects of climate change on women. This was done so as to compliment primary data since primary data alone cannot bring out the background of the study as well as the literature on the topic. Thus I infused both of these sources so as to come up with a substantial study.

### **3.6 Ethical considerations**

Saunders et. al. (2007), stresses that, research ethics refer to the appropriateness of a researcher's behavior in relation to the right of those who will become subjects of the researcher's work. Hence as the researcher I followed all the ethical considerations so as to avoid unnecessary impediments to my research.

#### **3.6.1 Seek Permission**

For one to successfully carry out her study in a certain area she needs to seek permission from the authorities first. This is starting point of familiarizing one's self with the area. In this case I first sought permission from the Gurube Rural District Council as well as the village head and was granted permission. Seeking of permission is of great importance since all communities are binded by certain norms and rules that must not be violated, thus by seeking permission one will also be familiarized by does and don'ts of the community as well referred to people with rich information on the topic under research.

#### **3.6.2 Voluntary**

All the respondents to this research voluntarily participated. The researcher made it clear to the participants, that it was an academic research thus participating was not a mandate but according to their wish. Participants were also allowed to withdraw during the course of an interview or discussion.

#### **3.6.3 Privacy and confidentiality**

Privacy and confidentiality of the participant's information is very crucial. Information should not be disclosed to anyone without the participant's consent. The respondents were also notified



that their information was not to be leaked as it was strictly for the viability of this study. However other participants were not worried about privacy as they wanted their pleas to be heard.

### **3.7 Limitations**

#### **3.7.1 Financial constraints**

The researcher faced financial constraints in the carrying out of this study. This is the major reason why I used interviews and group discussions so as to carry out my study in 2 days. I was avoiding going back again to the site as I did not have enough money. However with the little I had I managed to carry out a substantial piece of research. Through interviews and group discussions as well as cite observations I managed to gather all the necessary facts for the viability of this research.

#### **3.7.2 Time**

The research was carried out in a short period of time, thus the research was carried out in less than a week. This made me to miss an interview with the District Administrator of Guruve district that was always out of the office with work. Nevertheless, though the time was limited I managed to utilize the available response to gather all the necessary information required for the success of this research.

### **3.8 Chapter Summary**

In summation, this chapter has explored the various methods that have been employed by the researcher in gathering information for the success of this research. The researcher employed qualitative research design. In this, she used both secondary and primary data sources. Under

primary data she used semi-structured interviews, focused group discussions and observations on the environment so as to have a deeper understanding on the effects of climate change as well as to confirm the data from the informants. Secondary sources like text books, electronic journals, internet, newspapers and scholarly articles on climate change were used in complimenting primary data, since primary data alone could not review on what other writers has noted on climate change and rural women and also it could not bring out global evidence of climate change. The researcher also articulated on some of the constraints that she encountered during data collection.

## **CHAPTER 4**

### **DATA PRESENTATION, ANALYSIS AND DISCUSSION**

#### **4.0 Introduction**

This chapter is going to present, analyze and discuss data that was collected during the course of this study. The analysis will be based on the aims and objectives of this study which are to explore the impacts of climate change on women, examine the reason behind their continuous suffering despite the efforts of the government and NGOs, assessing the coping and adaptation measures that has been employed by women. In this chapter data is going to be presented thematically. This data was collected through semi-structured interviews, observations and focused group discussions.

#### **4.1 Effects of climate change on women**

##### **4.1.1 Deterioration of agriculture**

The most catastrophic effect of climate change on women in Guruve district ward 20 is the decrease in agricultural production. Agriculture is the back born of the community's livelihood with maize and tobacco being the main crops grown. Income for the sustenance of their families is derived from these crops, thus with the decline in agricultural production their ability to generate income and save has been affected. Data from interviews, FGDs and observations revealed that people were no longer producing enough prior to the period 1980s and 1990s. This was mainly because of little or no rainfall being received in the area. According to a woman in a group discussion;

*We no longer receive much rain as we used to get before. Back in the days in the 80s and 90s we used to receive 3 groups of rains namely bumarutsva in August, Gukurahundi in late September and munakamwe in November. But however this is no longer the case we only receive munakamwe in December and in most cases the rains leaves early before the maturity of the crops like what happened in 2007 and 2015. If not for the government which assisted us in 2016 with a bag of maize per month we would have died of hunger and as women you know everyone will be looking up to you when it comes to putting food on the table.*

From her sentiments, it can be noted that climate change has affected people's food security and women at large due to their gendered roles of taking care of the family. Ms Dunya also adds on food insecurity stating that;

*I am forced to eat one meal a day due to poor agricultural yields. Last year that is 2016 I only produced 4 bags of maize comparing to other years that was my worst. My children usually go to school on an empty stomach and often eat porridge when I do some part time jobs of which they are hard to find considering that almost everyone is affected.*

This is clear evidence that climate change is affecting women and their right to nutritious food. Children are also affected as they are forced to go to school on an empty stomach. This has a negative impact on their studies as they will lose concentration due to hunger.

The deterioration of the agricultural production has affected women's ability to save and send their children to school. Women in a group discussion pointed out that back in the days they could sell their farm produce to the Grain Marketing board (GMB) and earn some extra cash in

which they could use to send their children to school and buy seeds and fertilizers for the next season, but due to low output in the agriculture sector this is no longer the case. Most women stated that, the poor performance of the agricultural sector has made some of their children to drop out of school due to lack of school fees. Respondent A said that;

*The failure of crops has made my daughter to drop out of school. I failed to pay her school fees which made her unable to proceed to form one because the headmaster there requested for the grade seven results. As a result she is now doing housekeeping in Harare and we are now depending on her as young as she is.*

She uttered these words with sadness on her face. She was really concerned with her daughter who failed to complete her studies. The researcher observed that the respondent was a single mom that is why she was troubled. From her story, it has become clear that, the change in rainfall patterns as a result of climate change has affected children's rights on education. This is the violation of article 11 on the African Charter which states that every child has the right to good quality education. Therefore there is need for the government and NGOs to chip in and address this issue, since it is affecting the education of children which is the foundation of a better future.

Customary law on the issue of owning land was another factor that was affecting most women's agricultural production in ward 20. Women in the area own land through their husbands and in the event that the husband dies women are stripped off their right to land. Women in a group discussion held at Zimbabwe Apostolic Faith Mission church conquered that, customary laws within the community disadvantaged women in that they were not allowed to own land. In the

event that the husband dies the land ceases to be hers. They pointed out that the only women owning land in the area were those without greedy uncles. One woman revealed that;

*When my husband died, I was forced to leave my compound because I did not have any children with him. I refused to leave the house that I have built with my husband and in return all the land that we had was taken by his family. I now grow maize on a small piece of land that is being landed to me by my neighbor and I hardly harvest 5 bags from it.”*

This is clear evidence to show that unfair distribution of land in the community is further exposing women to the vagaries of climate change.

Adding on the issue of land distribution, I went on to interview the village head and he revealed that no women had come to him asking for a piece land. He also commented that he was not aware of the issue that women were being denied the right to their late husband’s land. However, judging from his facial expressions I could tell that he knew of the gender disparities and unfair distribution of the land but was afraid of confiding it.

The researcher also observed that, the decline in agricultural activity mostly affected women due to their lack of education on accessing financial loans as well as lack collateral. Women failed to access loans to strengthen their financial base due to lack of collateral. In a discussion with women from ZAFM women especially widows complained that they were denied agricultural loans due to their lack of collateral. Those who could access them complained of high interest rates.

More so, the deterioration of agriculture has robbed women off their livestock. Ms katizamhuka in an interview bitterly highlighted how she lost her livestock after failing to pay back a tobacco company. She said;

*Kutaurirwa hunyimwa sembare dzekumusana, I lost four cows to a certain tobacco company after failing to pay back their loan. Failing to pay back their loan was not my fault but rather the rains failed me. Almost half of the tobacco became bush tops due to lack of rains as a result I couldn't harvest anything. As if that was not enough the tobacco company that have given me the inputs refused to extend my loan term to the next season and took my remaining four cows as compensation. They were the only ones I had my child and now I am only left with two goats that does not plough. I have resented the whole thing of agriculture. I am now into selling tomatoes and vegetables at the growth point.*

This clearly shows that the effects of climate change on agriculture negatively affect women as their means of production are threatened. It can also be noted that due to heavy reliance on agriculture for their livelihood women are forced to look for other alternatives to fend for their families.

Moreover, from the FDGs conducted in ward 20, there is no doubt that lack of education on climate related issues makes women more vulnerable to the effects of climate change. From my observation most women were not really aware of what climate change is and what could possibly be done to lessen its impact. Majority of them thought that, the changes in weather patterns was only affecting them due to misfortune caused by people who were committing abominable practices. According to Mr Katena, this area is cursed due to its abominable

practices so the changing of weather patterns is the gods' way of showing their wrath on us it will pass. Therefore there is need for the government and NGOs to extend climate change related information to remote areas.

From the data collected, it has become clear that women constitute about 70-80% of the labor force. According to the agriculture extension officer in ward 20, women are the ones who do the sowing of the seeds, weeding, applying fertilizers, harvesting and threshing of the crops. Men only play a complimentary role when it comes to field work. Women are also responsible for the upkeep of the livestock and maintenance of the vegetable gardens thus, with low precipitation rates received in the area women suffers due to their multiple gender roles.

Low precipitation rates have led to loss of livestock. In 2008, a lot of people lost their cattle in exchange of maize. FDGs conducted highlighted that, one could exchange 1 cow for 7 bags of maize. This was unfair trading system considering the value of cattle, but however that was the only way for survival. The period 2008 was characterized by droughts which struck almost the whole country due to the failure of rains. Most women from the FDGs highlighted that the period was unbearable as some without livestock to exchange with maize could sleep on an empty stomach. They also highlighted that most of them had one meal per day so as to save food. They had a saying that “*ashama haawe*” hence with that one meal a day they were able to survive. Only a few individuals were not affected but the rest suffered.

More so, due to failure of crops in the period 2008, women in a bid to feed their families they could eat sadza made of maize seeds. Ms Chiriyo pointed out that;

*Gore riya handife ndakarikanganwa (I will never forget that year). I remember one night that we slept on hunger and the following morning we were given maize*



*seeds by the government to grow as the rainy season was approaching. Instead of sowing the seeds I opted to grind the 10kg bag to make sadza for my family. I washed the seeds first so as to rinse off the chemicals in it and then grind it.”*

This clearly shows the difficulties women had to go through as a result of climate variability. Children’s health was also affected due to poor nutrition as they were exposed to the same poor diet every day.

#### **4.2.2 Depletion of water resources**

Water scarcity is another threat that is being imposed on women by climate change. Wetlands in the area have been altered by climate change they no longer holds water as they used to in the 90s. Thus women will be forced to walk long distance in search of clean and safe water for their homesteads. During the rainy season most people practice water harvesting whereby they use their buckets to collect rainy water from their iron and asbestos roof tops. This is done so as to avoid walking long distances in search of clean water.

During the rainy season, clean and safe water in ward 20 Gombarasham village is hard to find and most people rely on water from wells dug in the river banks. According to Mrs Mukundwa most of these wells provide dirty water and in most cases it will smell cow dung. She highlighted that for one to be able drink the water she has to boil it first so as to make the smell fade.

*Figure 1: showing Ms Mukundwa from ward 20 fetching water from a well dug in the riverbeds of Dande river*



*Source: field observation*

Women have been mostly affected by water scarcity as they are forced to walk long distances to fetch water. Women have revealed that during winter and summer they walk close to 5km to fetch water. One of the respondents in a group discussion stated that;

*During summer we walk close to 5kms to fetch water and we spent about four hours whilst there. This is so because there is only one functioning borehole in Gombarashama village during summer the other one dries up in winter. Most of the times we spent 1½ to 2 hours waiting for the borehole to resume pumping and usually the water will be dirty as well. One is allowed to collect two buckets of water per day, some of us have infants we need more than that to maintain hygiene.*

Water scarcity greatly impacts women due their gender roles. Culturally women are responsible for fetching water, washing and taking care of the family, thus with the depletion of water resources they will be forced to walk long distances worst those with infants will walk the distance of three kilometers carrying both a 25litre bucket and a kid. This becomes a burden to them. Children are also not spared from this especially girls. The travelling of long distance in fetching water also affects their studies. One teacher stressed that, in summer girls usually sleep in class because they will be exhausted and as a result their performance and results will be poor.

Adding on, the travelling of long distances to fetch water greatly affects children especially girls. An interview with a village health worker highlighted that, children walking long distances carrying 20-25 liter bucket may result in the damage of a child's spine and pelvis.

Water scarcity has led to the outbreak of diseases like cholera, bilharzia, diarrhea and typhoid. As stated above that women were only allowed to access 2 buckets of water per day cases of diarrhea especially to children has become the order of the day. Women will be the ones to take care of the sick. According to a village health worker, women are the ones who usually come with the children to receive medication at the clinic. Even in 2008 where there was an outbreak of cholera women were the ones attending the sick. This taking care of the sick and the family robs them their time to participate in decision making processes as well as time to do some income generating projects like men do.

Women are also exposed to attacks by dangerous animals like crocodiles. As a result of water scarcity most women do their laundry in Dande River which is filled with crocodiles. According to a village health worker, in 2015 three women were attacked by crocodiles whilst doing their laundry and in 2016 two were attacked whilst the other one was fishing and the other was

fetching water for watering her garden. Livestock has not been spared, cattle, goats, donkeys and dogs have been killed by crocodiles. The health worker went on to say that in the period prior to 2000 manyemu and chikodzongere rivers used to hold up water up to the next rain season and our women were safe but now due to climate change these rivers dries up before winter thus leaving women without no other option than to use water from Dande river.

According to an AGRITEX officer, depletion of water resources has greatly affected women. Their garden projects have been affected due to water shortages. He said;

*Women in ward 20 used to practice intensive gardening during summer and winter. This made them financially independent as they could sell the products and earn some money. Most women were able to send their children to school using this money and they also use it to purchase farming inputs like pesticides but however due to rapid drying up of rivers women are left vulnerable as their source of income is affected.*

The AGRITEX officer also commented that the water table levels in Guruve district are further decreasing. Therefore women who are termed to be inseparable with nature by Vandana Shiva will be affected as the environment deteriorates

#### **4.2.3 Loss of biodiversity**

Low precipitation rates in Guruve district have altered the biodiversity of the area. Flora and fauna have been greatly affected such that energy sources have become scarce. IPCC (2007) has that, forests occupy about 21% of the land in Africa and this coverage is likely to decrease to about 9% as a result of shifts in vegetation zones by the year 2050. Projections by IPCC are

turning out to be true as evidenced by the observations made by the researcher in ward 20. Forests in the area are depleting thus leading to a lot of animal's extinction such as hares, buffalos among others. Mr Kahwiti pointed out that, with the depletion of forests, hunting has become the thing of the past because even if one goes hunting he will come back home empty handed, thus affecting their diet as they used to prepare their dishes with bush meat. He also stressed out the, traditional herbs are diminishing due to the shift in vegetation zones.

More so, the shift in vegetation zones also affects energy sources in the ward. This is so because people use firewood as their source of energy. Women are greatly affected as they are forced to walk long distances to fetch firewood. This robs them their time to participate in other activities like decision making within the community. Ms Mutero pointed out that;

*We usually fetch firewood on Fridays which is our 'Chisi'. This is the day when everyone in the community will be resting especially during rainy season and this is the same day in which man do their gatherings to discuss matters to do with the community. As a result us as women we are left out doing house chores thereby lagging behind when it comes to decision making process."*

Loss of biodiversity has resulted in conflicts over pastures within the community. Grazing land for cattle is diminishing in the area such that people are personalizing grazing land. In most cases women will be forced to go to neighboring villages with their livestock in search of pastures since their husbands will be at the mines. This exercise further burdens women as it is not an easy task to control a flock of animals.

### **4.3 Adaptation measures**

The community has managed to come up with some coping and adaptation strategies with the assistance of the government and NGOs. The community stressed out that although they had put up adaptation measures, they have been of little significance as they are not sustaining them. They also highlighted that coping mechanisms initiated by NGOs only sustains them for a short period of time and they were longing for something that could suffice them.

#### **4.3.1 Shifting of planting dates**

The community has shifted their planting dates to mid-December from late October. This is because of the shift in the rainy season as noted above that the community no longer receives the three groups of rains it used to get before. This method has not been fully successful because in most cases the rains leaves early before the maturity of the seeds and sometimes the timings will be wrong on when exactly to plant the seeds. Therefore there is need for the AGRITEX officers to work together with the meteorological offices to assist the farmers on when exactly to start planting their seeds. Ms kamuriwo stated that, the rainy season is no longer predictable these days, most of the times the rains comes late and leaves early before the maturity of the seeds. So I have shifted my planting dates to mid or late December when the first rain rains.

#### **4.3.2 Preservation of surplus food**

Women in FDGs highlighted that in the event that their crops performs well they could prepare '*mufushwa*' (dried vegetables), whereby they could dry vegetables and pumpkin leaves, ground nuts as well as maize for future consumption. They revealed that this greatly assist them during summer when relish is a problem. It was noted that this was practiced way before the severity of

climate change but however with climate change impacting on their food security women are now preserving dried vegetables in large amounts so as to sustain them. Sweet potatoes were also stored in what they called '*pfimbi*'. Some of the women could sell the dried vegetables in urban areas and earn some money. This has been very helpful especially to those who could go to towns to sell their dried vegetables. One woman commented that she could get money to send her children to school by selling dried vegetables in Harare and she had established customers.

#### **4.3.3 Crop diversification**

Women in ward 20 have resorted to crop diversification so as to lessen the severity of climate change. Crop diversification is whereby they mix different types of crops on the same piece of land. Data from FDGs indicated that, crops like maize, millet and sorghum, rappoko, groundnuts and beans were grown together. Sorghum and millet require less time to mature and they are drought resistant crops unlike maize thus in the event that the rains leaves early people will harvest sorghum and millet. Crop diversification reduces that total failure of crops; if one fails the other one will thrive. This method has been employed by almost everyone in the community as it has proved to be quite useful since one could get something out of her field unlike if she has grown maize only. However women in ward 20 also have to deal with birds and animals like monkeys and baboons as they are a threat to their crops. Moreover, people have resorted to the growing of short term maize seeds like '*stoko*' which matures in 2½ to 3 months.

#### **4.3.4 Off-farm activities**

Intensive gardening activity has been employed by women in ward 20 a strategy to cope with climate change. They practice this method during winter and summer near rivers. Their source of water is drawn from Dande River. This has proved to be useful in winter because Dande River

will still be filled with water. Women in a group discussion pointed out that these gardens made them financially dependent since they were the ones who planted, weed, and harvest and sell the vegetables at Guruve growth point. Vegetables like tomatoes, rape, covo, onions and beans were grown. Beans gave them quick money because it was sold whilst green (green beans). However in summer these gardens tend to die due to the quick drying up of Dande River. This left women vulnerable without any source of income as compared to their male counterparts who will be into gold panning. Therefore water scarcity as a result of climate change greatly impacts on women who are largely depending on the environment for their livelihoods.

#### **4.3.5 Conservation farming**

This has been implemented by Sustainable Agricultural Trust (SAT) to the community. Its main aim is to preserve the soil structure, nutrients and moisture. The process is labor intensive as it requires the digging of holes as well as mulching. Mulching is done so as to minimize the amount of evaporation as well as providing manure. Data from FDGs revealed that conservation farming has not been fully adopted because it requires a lot of labor and most households have the elderly people who cannot go through the labor of digging holes whilst they have cattle and ploughs. Ms Ndoro in an interview highlighted that, Conservation farming is very helpful. Last year 2016, I managed to get 18 bags of maize whereas the majority hardly harvested 2 bags of maize and this was because the rains left early leaving those who used ploughs in their fields vulnerable as their fields could not hold water as mine did.

#### **4.4 The role played by Government and NGOs**

The government through Grain Marketing Board (GMB) has assisted the community with a bag of maize per month, last year when the community got poor harvests. Although some



complained that 1 bag of maize per month was not enough for their large families, the government tried its best considering that almost everyone was in need of assistance. From the observation made, the researcher concluded that the role played by the government in providing these people with maize was of paramount importance as it managed to sustain them in the long run.

The government has also taken a step in assisting women to cope up with climate change by giving them farming inputs. This has greatly helped the community because with low agricultural production it has become hard for them to save money to buy inputs for the next season. Data from group discussions highlighted that, they were being provided with a 10kg maize seeds and 2 bags of fertilizers. Although it seems little but to the community it was of paramount importance as they could have a start. They pointed out that in most cases their husbands could go gold panning so as to add on the bags of fertilizers.

More so, the government through food for work programs the community managed to get extra maize to sustain them. The GRDC in a bid to maintain their roads, they engaged the community by giving them a bucket of maize in exchange of labor. Most women in FDGs stated that this greatly helped them although they had to provide labor.

NGOs like Sustainable Agricultural Trust (SAT) has assisted the community in coping with climate change by educating them on the essence of conservation farming. SAT has emphasized on the practice of zero tillage and the use of manure. This has not been fully adopted by the community as it is labor intensive. It has only been adopted by those who do not have cattle and it has yielded positive results especially in 2016 whereby the majority in the community got poor

harvest. A few who had implemented conservation farming managed to get something from their fields.

ENTERPRIZE has been instrumental in assisting women in Guruve district to cope with climate change by providing them with short season mung beans. Most women in FDGs stress that, this project by ENTERPRIZE has greatly assisted them as they are able to sell some the beans and earn money. Mung beans is a short season crop which matures in 2 months thus with low precipitation rates characterized with Guruve district this crop is not affected as highlighted by women in a group discussion at ZAFM church. Therefore, considering this it can be noted that NGOs has managed to assist the community with coping mechanisms to climate change vagaries.

#### **4.5 Chapter summary**

The above chapter presented the findings of this research. It has linked the findings with the objectives of the research such as the impacts of climate change, why women are more vulnerable to climate change, assessing the adaptation measure they have employed to deal with the effects of climate as well as assessing the efforts made by NGOs and the government in assisting the community to cope and adapt to climate change.

## CHAPTER 5

### CONCLUSIONS AND RECOMMENDATIONS

#### 5.0 Introduction

The following chapter is going to conclude this research. The summary will be given in line with the main objectives of this study. Recommendations will also be ushered in this chapter in which the researcher views viable to the community. The researcher will also provide some of the recommendations that the women in ward 20 Guruve district requested for.

#### 5.1 Conclusions

It has come clear that climate change is a pertinent issue that is affecting food security as well livelihoods. Rural women are the ones who have been mostly affected by climate change due to lack of control over resources, poor financial base, and lack of education on climate change and of course the existing gender disparities.

The first objective of the study was to explore the effects of climate change on women. From the observations and findings of this study, climate change has greatly affected women in Guruve district. Low agricultural production as a result of low precipitation rates has robbed off women their ability to save and send their children to school. It has been noted that women used to be financially independent through selling surplus harvests but due to the effects of climate change this is no longer the case. More so, gender roles of women have been strained as a result of climate change as there are forced to walk long distances to fetch water as well as firewood. This has also affected children's performance in school especially girls as they will be assisting their

mothers to do household chores. Therefore climate change has negatively impacted on women as evidenced by the above.

From the second objective which was to assess the coping and adaptation measures implemented by women in ward 20, the researcher found out that only one strategy has proved to be useful out of many. Crop diversification infused with drought resistant crops like sorghum, millet and rapoko is the only viable measure that the community has implemented so far. Other measures like conservation farming have not been fully adopted due to its labor intensiveness. This is justifiable in that it is difficult for one to dig 2 hectares of holes thus instead people only concentrated on small a piece of land of which it's not sustaining them. As for the shift in planting dates many farmers has not been able to predict the right time hence their crops fails. Therefore there is need for AGRITEX in conjunction with the meteorological department to work with the community and educating them on when to sow their seeds as well as the types of crops to sown. However, although the growing of drought resistant crops has proved to be sustaining the community it seemed that they were not used to eating these crops but rather maize is their favorite.

On examining why women still suffer despite the efforts made by the government and NGOs, the researcher found out that both the government and NGOS are not engaging the community on the way forward but rather they are imposing projects on them. For instance the government has been giving the women in ward 20 a bag of maize per month but when the rainy season comes they were not given adequate farming inputs so that they will be able to produce enough to sustain them. This has been the major flaw of the efforts made by the government. If this persists the problem will continue to grow and considering the economic situation in the country the provision of I bag of maize might as well seize to exist.

NGO as well, has not done much in complementing the government efforts. Not much of the NGOs have come up front to offer coping and adaptation measures to the effects of climate change. SAT has come up with conservation farming but it has not been fully adopted thereby revealing the weaknesses of imposing ideas on the community without consulting them first. Therefore there is need for both the government and NGOs to involve the community in trying to address the issue of climate change since they are the ones most affected and they are the same people as well who know what can best solve their plight.

This research has also highlighted why women are more susceptible to the vagaries of climate change. Lack of education on climate related issues and lack of collateral to secure loans made women to be more affected by climate change. Rural women receive less education on climate related issues than their urban counterparts thus there is need for information dissemination in remote rural areas like ward 20, Guruve district. Customary law which forbids women to own land in the community has also exacerbated the vulnerability of women to climate change.

## **5.2 Recommendations**

### **➤ Women's involvement in decision making**

There is need for full participation and contribution to decision making especially in climate related issues being able to give adaptation and coping measures to climate change since they are the ones who are mostly affected. There is also need to provide training to women on climate related issues through networks and support groups as well as providing training to women organizations.

### **➤ Land ownership and control of natural resources**

Equal land ownership has always been a problem in Zimbabwe even the fast track land reform sidelined women with man owning the majority of the land, thus there is need for equitable access of owning resources. Customary law which forbids women to own land should be removed.

➤ **Bottom-up approach in coming up with adaptation measures**

Policy makers and NGOs need to implement a bottom-up approach when drafting adaptation measures. This will assist them with not reduplicating measures that have been tested and failed. More so, by dealing with the grassroots they will be able to draft adaptations that suit the area.

➤ **Gender analyses in climate related issues**

There is need for a gender analyses when coming up with policies, budgets, projects and programs that are related to climate change since the effects are disproportionately felt depending with one's gender and location.

### **5.3 Chapter summary**

This chapter has successfully given the conclusion of this thesis in line with the objectives. Women have been seen as the most affected due to their heavy reliance on nature and gender. The researcher has provided recommendations in which she believes will be of great help to the women in Guruve district in adapting to climate change.

## **Reference List**

Adger, W.N.K. et al (2007): *Assessment of adaptation practices, options, constraints and capacity. Climate Change 2007: Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Fourth Assessment Report of the Inter-governmental Panel on Climate Change. Cambridge University Press, Cambridge, UK, 717-743.

Brown, D. et al (2012) *Climate change impacts, vulnerability and adaptation in Zimbabwe*. IIED Climate Change Working Paper No. 3, October 2012.

Brucho, I. (2011) *Gender and Climate Change*, London, Patel and Sons Ltd.

Butt, T. A., McCarl, B. A. Angerer, J., Dyke, P. T., and Stuth, J.W. (2005). *The Economic and Food Security Implications of Climate Change In Mali*. *Climate Change* 68:355-378

Chanaka S (2014) *A study on the impact of climate change and climate variability on rural women in Chivi district*. Midlands State University.

Chimanikire (2013) *Adaptation to climate change and Variability in the Rural Agricultural Sector- A Case of Guruve*

Chronicle (2014) *Women most affected by climate change*. Available at [www.chronicles.org](http://www.chronicles.org).

Danzin, N and Lincoln (Eds) (1994) *Handbook of Qualitative Research*, Thousand Oaks (Calif) Sage

Dawson, Catherine (2002) *Practical Research Methods*, New Delhi UBS.

Dube, T. and Phiri, K. (2011) *Rural Livelihoods under Stress; the impact of climate change on Livelihoods in South Western Zimbabwe*, American International Journal of Contemporary Research, Vol 3. No. 5.

FAO (2010). *Crop and Food Security Assessment Mission to Zimbabwe*. [Online] [Accessed on 11 April 2017] <http://www.polity.org.za/article/faowfp-cropand-food-security-assessment-mission-to-zimbabwe-august-2010-2010-08-11>

FAO, (1996) *Rome Declaration on World Food Security and World Food Summit Plan of Action*. World Food Summit 13-17 November 1996. Rome.

Gletibou, S. (2009) *Climate Change, a Further Challenge for Gender Equity*, New York, Cambridge University Press.

IED (2012) *Climate Change Impacts , Vulnerability and Adaptation in Zimbabwe*, Working Paper No.12.

Ifeanyi-Obi, C.C., Etuku, U.R. and Jike-wai, O. (2012) *Climate Change, Effects and Adaptation; Implication for Agricultural Extension System in Nigeria* Greener Journal of Agricultural sciences ISSN: 2676-7770 Vol.2, pp053-060, March 2012

IPCC ( 2012).*Climate Change 2007.Adaptation and Vulnerability*, Summary for Policymakers, Intergovernmental Panel on Climate Change, Geneva, Switzerland

IPCC (2007a) *Climate Change 2007: Impacts, Adaptation and Vulnerability*.Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Annex I, Parry, M.L., Canziani,O.F., Palutikof, J.P., van der Linden, P.J., and Hanson, C.E., eds., Cambridge:Cambridge,. University Press, UK



IPCC (2012). *Summary for Policymakers. In Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*. Cambridge University Press.

IPCC (2013b) Annex II: Climate System Scenario Tables ,Prather, et al (eds.) *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, United Kingdom and New York, NY,USA.

Kothari, CR (1985) *Research Methods and Techniques*, New Delhi, Wiley Eastern Limited

Kurukulasuriya, P. et al (2006) *Will African agriculture survive climate change?* World Bank Economic Review 20(3), pp. 367–388

Maddison, D. (2006)*The perception on adaptation to climate change in Africa. CEEPA Discussion Paper No. 10*. Centre for Environmental Economics and Policy in Africa, University of Pretoria, South Africa.47pp

Matarira, C. H., Makadho, J. M., and Mwamuka, F. C. (1995) *Zimbabwe: Climate change impacts on maize production and adaptive measures for the agricultural sector*. In: C., Ramos-Mane, and Benioff, R. (eds) Interim Report on Climate Change Country Studies, US Country Studies Program, Washington, DC.

Matarira, C. H., Makadho, J. M., Mwamuka, F. C. (1995). *“Zimbabwe: Climate Change Impacts on Maize Production and Adaptive Measures for the Agricultural Sector”* in Ramos-Mane, C. and Benioff, R. (Editors) Interim Report on Climate Change Country Studies, US Country Studies Program, Washington, DC.

McCarthy, J., Canziani, O.F., Leary, N.A., Dokken, D.J., White, C., (eds.) (2001) *Climate Change 2001: Impacts, Adaptation, and Vulnerability*. Cambridge, Cambridge University Press.

Ministry of Agriculture, Mechanization and Irrigation Development, (2012) *Second round crop and Livestock assessment report*, Government of Zimbabwe.

Moyo, M., et al (2012) *Farmer perceptions on climate change and variability in semi-arid Zimbabwe in relation to climatology evidence*. African Crop Science Journal, 20(2), pp. 317-335

Mudzonga E, C (2011) *Farmers Adaptation to Climate Change in Chivi District Zimbabwe*

Nath, P.K. and Behera, B. (2011) *A critical review of impact and adaptation to climate change in developed and developing economies*, Environment, Development and Sustainability (2011) 13:141–162.

Nhemachena, C. and Hassan, R. (2007) *Micro-Level Analysis of Farmers Adaption to climate change in Southern Africa*. International Food Policy Research Institute.

Nhemachena, C. and Hassan, R.(2007)*Micro-level analysis of farmers' adaptation to climate change in Southern Africa*. IFPRI discussion paper No. 00714. International Food Policy Research Institute, Washington, D.C.

Ofuoku, A.U. (2011) *Rural Farmers' Perception of Climate Change in Central Agricultural zone of Delta State, Nigeria* Indonesian Journal of Agricultural Science 12(2), 2011:63-69

Skynews (2013) available at [www.skynews.org](http://www.skynews.org).

Slegers, M.F.W. (2008) "*If only it would rain*": *Farmers' perceptions of rainfall and drought in semi-arid central Tanzania*. *Journal of Arid Environments* 72: 2106- 2123.

Smithers, J., and Smit, B. (2009). *Human Adaptation to Climatic Variability and Change*. In L. E. Schipper and I. Burton (Eds.), *Adaptation to Climate Change* (pp. 15-33). London: Earthscan.

Toulmin, S. (2009) *Climate Change in Africa*, London, Zed books.

UN publications ( 2014) *Women, Health and the Environment Our Planet* ,Volume 15, No 12, available at <http://www.unep.org>

UNDP. (2006). Human Development Report 2006. *Beyond Scarcity: Power, poverty and the global water crisis*, United Nations Development Programme. Available at <http://hdr.undp.org>.

UNFCCC (2007).UNFCC, *Climate Change: Impacts, Vulnerabilities and Adaptation Countries*.

UNFCCC,(2012)*National Adaptation Plans*. Online [Accessed on 20 March 2014] [http://unfccc.int/adaptation/workstreams/national\\_adaptation\\_plans/items/6057.php](http://unfccc.int/adaptation/workstreams/national_adaptation_plans/items/6057.php)

Unganai, L., (2009) *Adaptation to climate change among agro-pastoral systems*: case for Zimbabwe IOP Conf. Series: Earth and Environmental Science 6

Ziervogel, G., Cartwright, A., Tas, A., Adejuwon, J., Zermoglio, F., Shale, M and Smith, B.(2008)*Climate Change and Adaptation in African Agriculture*. Stockholm, Stockholm Environment Institute

Zikmund, W.G, and D'Amico, M (1996) *Marketing*; 5<sup>th</sup> edition. Juta and company limited.

Zimbabwe National climate Change Response Strategy (2012)

ZimStat (2012) Zimbabwe population census 2012.

## **Appendix**

### **Interview guide**

My name is Melody Mudzimuraga, a fourth year student of Development Studies at Midlands State University. In partial fulfilment of the requirements of the Bachelor of Arts Honours Degree, I am carrying out a research on the effects of climate variability on Women in Gombarashama village, Guruve. Your contribution will be greatly valued.

1. What do you understand by climate change?
2. In what ways has climate variability affected rural women?
3. What are the coping and adaptation mechanism that have been employed by women in adapting to the effects climate change?
4. What challenges have been faced or are being encountered by women in adapting to the effects of climate change?
5. What do you think should be done to address this issue?
6. Have you received any help from the government and NGOs if so was it helpful?