A STUDY ON THE EFFECTS OF CLIMATE CHANGE ON WOMEN LIVELIHOODS IN DANDE VALLEY WARD 34, MT DARWIN DISTRICT, ZIMBABWE.

BY

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APPROVAL FORM

The undersigned certify that they have read this project and have approved its submission for marking after confirming that it confines to the Faculty of Science, Geography Department and HBSc DMS requirements.

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SUPERVISOR Date

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CHAIRMAN DATE
DECLARATION FORM

I, **DZUNGU LINDSAY TAFADZWA**, registration number **B1440897**, declare that this dissertation is the product of my own work and has not been previously submitted to any University other than Bindura University of Science Education. All the sources used or quoted have been indicated and acknowledged as complete references.

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Signature  Date
DEDICATION

This dissertation is dedicated to my parents Shander and Catherine Dzungu. Thank you for your undying support and love. I also dedicate this work to my two siblings Precious Tadiwanaishe and Tatenda Shander (Jnr). This would have never been possible if it was not for your love, care and support. Mum and dad I thank you for believing in me. You have been my pillars of strength throughout and I appreciate it all.
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May the Almighty God bless you all.
ABSTRACT

The study assessed the effects of climate change on women livelihoods in ward 34 of Mt Darwin district. The study used a sample size of 137 respondents. It identified the livelihood activities done by women and highlighted the reasons why women livelihoods are more vulnerable to climate change as compared to men. Agricultural livelihoods constituted 90% and this has an impact on income levels as the agricultural sector is the most affected by climate change. The effects of climate change on women as shown by the findings are exacerbated by marital status, education level attained and age. According to the respondents’ information, the study revealed that women livelihoods negatively affected by climate change constitute about 99%. Qualitative and quantitative analysis was employed on data collected. A questionnaire consisting of both open and close ended questions was administered to selected households and they were all completed for analysis. Two Focus Group Discussions (FGDs) were held and interviews were also used to source information from the key informants. While 24% of the respondents were not aware of climate change, 76% of the households were aware and they correctly acknowledged climate change as caused by both natural and manmade aspects. Research findings show the challenges to the effectiveness of women livelihoods and these include lack of education, labour intensive, existence of quelea birds and lack of freedom of action. On assessing the climate change effects, the study revealed that there are possible coping strategies which women are adopting to safeguard their livelihoods and these include conservation farming, crop diversification humanitarian assistance. The study findings show that climate change challenges development efforts hence the study recommends economic empowerment of women. Also the government and private sector should promote the growing of open pollinated varieties (OPVs) so that women farmers acquire both grain and seeds from their produce.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPROVAL FORM</td>
<td>ii</td>
</tr>
<tr>
<td>DECLARATION FORM</td>
<td>iii</td>
</tr>
<tr>
<td>DEDICATION</td>
<td>iv</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENT</td>
<td>v</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>vi</td>
</tr>
<tr>
<td>LIST OF TABLE</td>
<td>ix</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>x</td>
</tr>
<tr>
<td>LIST OF APPENDICES</td>
<td>xii</td>
</tr>
<tr>
<td>ACRONYMS</td>
<td>xiii</td>
</tr>
<tr>
<td>CHAPTER ONE</td>
<td>1</td>
</tr>
<tr>
<td>1.1 Introduction</td>
<td>1</td>
</tr>
<tr>
<td>1.3 Statement of the problem</td>
<td>3</td>
</tr>
<tr>
<td>1.4 Research aim</td>
<td>3</td>
</tr>
<tr>
<td>1.5 Objectives of the study</td>
<td>3</td>
</tr>
<tr>
<td>1.6 Research questions</td>
<td>3</td>
</tr>
<tr>
<td>1.7 Justification of the study</td>
<td>4</td>
</tr>
<tr>
<td>1.8 Limitations of the study</td>
<td>4</td>
</tr>
<tr>
<td>1.9 Delimitation of the study</td>
<td>4</td>
</tr>
<tr>
<td>1.10 Definition of key terms</td>
<td>5</td>
</tr>
<tr>
<td>1.11 Organisation of the study</td>
<td>5</td>
</tr>
<tr>
<td>1.12 Conclusion</td>
<td>5</td>
</tr>
<tr>
<td>CHAPTER TWO</td>
<td>6</td>
</tr>
<tr>
<td>LITERATURE REVIEW</td>
<td>6</td>
</tr>
<tr>
<td>2.1 Introduction</td>
<td>6</td>
</tr>
<tr>
<td>2.2 Climate Change in Zimbabwe</td>
<td>6</td>
</tr>
<tr>
<td>2.3 Climate Change (Global Level)</td>
<td>7</td>
</tr>
<tr>
<td>2.4 Climate Change (Regionally)</td>
<td>8</td>
</tr>
<tr>
<td>2.5 Climate Change Impact on Women</td>
<td>8</td>
</tr>
<tr>
<td>2.6 Impact of Climate Change on Women livelihoods</td>
<td>11</td>
</tr>
<tr>
<td>2.7 Chapter Summary</td>
<td>14</td>
</tr>
<tr>
<td>CHAPTER THREE</td>
<td>15</td>
</tr>
<tr>
<td>RESEARCH METHODOLOGY</td>
<td>15</td>
</tr>
<tr>
<td>3.1 Introduction</td>
<td>15</td>
</tr>
</tbody>
</table>
3.2  Description of the area ......................................................................................... 15
3.3  Research design ..................................................................................................... 16
3.4  Research methodology ........................................................................................... 17
3.5  Target population ................................................................................................... 17
3.6  Sampling Techniques .............................................................................................. 17
3.7  Research Methods .................................................................................................. 18
3.8  Reliability and Validity .......................................................................................... 20
3.9  Ethical considerations ............................................................................................. 20
3.10 Chapter summary ................................................................................................... 20

CHAPTER FOUR ........................................................................................................... 22

RESULTS, PRESENTATION AND DISCUSSION ................................................................ 22
4.1 Introduction .............................................................................................................. 22
4.2 Demographic profile study respondents ................................................................... 22
4.3 Climate change knowledge ..................................................................................... 25
4.4 Women livelihoods in Ward 34 of Mt Darwin ......................................................... 26
4.5 Effects of climate change on women livelihoods ...................................................... 29
4.6 Coping strategies to reduce climate change impacts on women ......................... 36
4.7 Challenges faced by women in effectiveness of livelihoods .................................. 38
4.8 Conclusion ............................................................................................................... 39

CHAPTER FIVE ............................................................................................................ 40

CONCLUSION AND RECOMMENDATIONS .................................................................. 40
5.1 Introduction .............................................................................................................. 40
5.2 Summary .................................................................................................................. 40
5.3 Conclusion ............................................................................................................... 41
5.4 RECOMENDATIONS ................................................................................................. 41

REFERENCE .................................................................................................................. 43
APPENDIX 1 Questionnaire .......................................................................................... 47
APPENDIX 2 Interview guide ......................................................................................... 51
APPENDIX 3 Focus Group Discussion Guide ................................................................. 52
LIST OF TABLE
Table 4.1: Climate change knowledge .........................................................25
LIST OF FIGURES

Fig 3.1: Mt Darwin map ward 34 ................................................................. 16
Fig 4.1: age range of the respondent ........................................................ 22
Fig 4.2: marital status of the respondent ................................................. 23
Fig 4.3: level of education ........................................................................ 24
Fig 4.4: livelihood activities in ward 34 .................................................... 26
Fig 4.7: challenges of livelihood effectiveness .......................................... 38
LIST OF PLATES

Plate 4.1: Woman owned grocery store on the left and on the right a woman selling fast foods...............................................................................................................................28
LIST OF APPENDICES

Appendix 1 questionnaire guide ................................................................. 50
Appendix 2 interview guide ....................................................................... 51
Appendix 3 focus group discussion ............................................................. 52
# ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEZ</td>
<td>Agro-ecological Zones</td>
</tr>
<tr>
<td>AGRITEX</td>
<td>Agricultural Technical and Extension Services</td>
</tr>
<tr>
<td>CC</td>
<td>Climate Change</td>
</tr>
<tr>
<td>NGO’s</td>
<td>Non-Governmental Organisations</td>
</tr>
<tr>
<td>UNFCCC</td>
<td>United Nations Framework Convention on Climate Change</td>
</tr>
<tr>
<td>IPCC</td>
<td>Inter-governmental Panel on Climate Change</td>
</tr>
<tr>
<td>FGD</td>
<td>Focus Group Discussions</td>
</tr>
<tr>
<td>OPV</td>
<td>Open Pollinated Varieties</td>
</tr>
<tr>
<td>UNDP</td>
<td>United Nations Development Programme</td>
</tr>
</tbody>
</table>
CHAPTER ONE

INTRODUCTION

1.1 Introduction

The impacts of global climate change and variability are becoming more evident with increased incidences of droughts, floods, hailstorms, more hot days and heat waves. Climate change is one of the biggest threats facing global development with the developing countries being more vulnerable due to their low adaptive capacity. Climate change has become one of the most pressing issues worldwide as it is seen as a great threat to earth’s existing life and biodiversity. Changes in earth’s climate threaten ecosystems and the future of various species that live within these bionetworks is negatively affected. While mankind has always had to live with, deal with and adapt to environmental challenges, the challenges posed by climatic change are however believed to be of such extent as to exceed historical experiences. This is likely to result in unprecedented challenge to local communities and the global community at large (Christoplos et al., 2009; Schipper, 2007). Akudugu (2011) defines livelihoods as the ability of individuals and households to take care of health, education, food, social and cultural needs. Households and communities engage in a number of activities and strategies in order to earn a living. Climate change affect men and women in different ways and their livelihoods., therefore their adaptation strategies differ correspondingly. The coping and adaptation strategies to the impacts of climate change are unlikely to be sufficient in some cases, particularly for women thus affecting their livelihoods. Therefore, the study seeks to highlight the effects of climate change on women livelihoods but taking Mt Darwin as a case study.

1.2 Background to the study

Climate change threatens everyone but does not threaten all people equally (Patterson, 2009). Women are disproportionately affected by natural disasters as they experience higher rates of mortality, morbidity and post disaster diminishment in their livelihoods. The role played by
women is often socially invisible but in great majority of households around the world their life-sustaining and income-generating activities of everyday life are extremely essential. It is widely accepted that adverse effects of climate change are felt clearly through much more abnormal weather and natural disasters such as droughts or floods, with the loss of biodiversity and gradual degradation of the environment and posing a threat to human development and prosperity (UN’s Human Development Report, 2007). Climate change has greatly impacted on social, economic and environmental systems and shaped prospects for sustainable agricultural and rural development (Fischer et al., 2002 cited in Le Thi Hong Phuong, 2011). In remote rural areas of Zimbabwe women are often poorer and less educated than men and also excluded from political and household decision making processes that affect their lives. Climate change is affecting everybody regardless of status, ethnicity, sex, race or level of income. Women suffer the most simply because they are women and poor. Women make up for 70% of the world’s poor. In addition, women tend to possess fewer assets and depend more on natural resources for their livelihoods. Women and poor communities are the groups of people who are most vulnerable to the impacts of climate change (Aguilar as cited in Dankelman, 2010). Gender issues have been rarely addressed in the context of the damaging effects of climate change. The roles of women are not adequately acknowledged or accounted for in climate change mitigation and adaptation efforts in national and global climate intervention talks or in the context of natural disasters influenced or exacerbated by climate change. The vulnerability of women to the effects of climate change is mainly because of their over-dependence on natural resources, their responsibility for water and food procurement and their increased risk exposure during times of disasters and severe weather crises (UNDP, 2009).

Mt Darwin District is selected as the case study area due to drought proneness of the area and women’s vulnerability to climate change in livelihoods that hinge on agricultural and livestock sectors increase. The district receives very low, unreliable rainfall as a result of climate changes and increased temperatures. Mt Darwin has become one of the most vulnerable communal areas and it is among disaster prone areas in Zimbabwe which experiences floods, frequent heat waves since 2009 and a number of strong winds that have displaced people and destroyed houses, clinics and schools. A growing number of diseases and extreme events related to climate change and variability have been recorded. Malaria incidences are high in Mt Darwin district due to the climatic conditions which are favourable for mosquito breeding.
1.3 Statement of the problem

Climate change is affecting men and women differently thereby influencing their livelihoods, priorities and adaptations strategies for coping with its challenges. Women are more dependent on natural resources for their subsistence therefore they are more exposed to climate change shocks and have fewer resources to protect their own lives, assets and livelihoods while looking after their families. The challenge of climate change obstructs people’s livelihood opportunities particularly of those living in rural areas thereby affecting their lives and production greatly. Though the effects of climate change are not discriminatory it has been argued that women are at the front line of climate change impacts because of gender roles they perform. They face social, economic and political barriers that limit their coping capacity. Women face the extreme poverty due to loss of income and damaged crops. As a result, their vulnerability is growing with alarming rate due to climate impacts on agricultural, livestock and water. Direct and indirect impact of current floods and droughts is imposing negative effects on women and their communities.

1.4 Research aim
To assess the effects of climate change on women livelihoods in Ward 34 of Mt Darwin District.

1.5 Objectives of the study
1. To identify women livelihoods in Ward 34 of Mt Darwin.
2. To determine the impacts of climate change on women livelihoods.
3. To assess copying strategies that can be put in place to reduce these impacts.

1.6 Research questions
1. What are the women livelihoods in Ward 34 of Mt Darwin District?
2. What are the effects of climate change on women livelihoods?
3. What copying strategies can be employed by women to reduce the impacts of climate change on their livelihoods?
1.7 Justification of the study
This study will help to take sustainable actions to reduce women’s livelihood vulnerability in Mt Darwin and invest in making development efforts to reduce the effects and impacts of climate change. The study is significant as it will assist the policy makers and implementers to consider the voice of women in the implementation of a climate change response. It will also create an interface for women to raise awareness campaigns towards climate change. The findings will assist women with appropriate interventions in the participation of local climate change discussions. Results of the study will also help women in boosting resilience as coping strategies will be in place to reduce climate change impacts and policy formulation which enhances women livelihood resilience to climate change effects.

1.8 Limitations of the study
The study is focused mostly on agricultural livelihood options but in the study area there are other existing livelihood options. Gender mainstreaming is affected by cultural factors such as the patriarchal ideas which are very dominant hence they hindered progress as men would control their wives in participating in the discussions. This had an impact on the information released whether it is reliable or not. Politics was another limitation since Zimbabwe is approaching the election period. People were afraid to air out their views because of the political atmosphere. There was inadequate information to answer all the research questions since captured data only explained what and how much has changed in the livelihoods practices of women and their household. The analysis did not show how the observed changes occurred in order to attribute whether the effects emanated from climate change alone. In addition, the study did not create room for the participation of men on climate change issues in relation to women so the results would not show the perspectives of men in the field of climate change issues in relation to women.

1.9 Delimitation of the study
The study concentrated on the effects of climate change on women in ward 34 of Mt Darwin District. It observed how women in Ward 34 take in the issues of climate change and identifying different climate change impacts which affect women livelihoods. This area was the ideal place for this study as the effects of climate change are mostly evident there and the effects are exposing livelihoods in the area to vulnerability.
1.10 Definition of key terms

**Climate Change** is defined as a change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer. Climate change may be due to natural interior processes or exterior forces such as variations of the solar cycles, volcanic eruptions, and persistent anthropogenic changes in the composition of the atmosphere or in land use (IPCC, 2007).

**Livelihood** is defined as the weapons to save rural people from the extremes of poverty safeguarding their food security and self-sustenance (Bird and Shepard 2003).

**Coping strategy** is defined as unplanned, reactive, active and short-term responses or strategies refer to pro-active and anticipatory changes over long periods to reduce the impacts of recurrent threats or gradual changes (Jolly 2002).

1.11 Organisation of the study

The study is organized into five chapters which outlines the steps taken by the researcher. The chapters are as follows:

**Chapter 1:** Introduces the study in Ward 34. The chapter covers the background of the study, statement of the problem, objectives and research questions.

**Chapter 2:** Reviews the conceptions and previous researches on effects of climate change on women livelihoods.

**Chapter 3:** Present the methods used by the researcher in conducting the research.

**Chapter 4:** Presents the analysis, presentation and discussion of the findings.

**Chapter 5:** The chapter presents the summary, conclusion and recommendations based on the outcomes.

1.12 Conclusion

The chapter highlighted the background of the study and the aim of the research which is to assess the effects of climate change on women livelihoods. It also gives the problem statement, objectives and guiding research questions.
CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter covers the literature gathered concerning how climate change has affected women livelihoods. With the particular attention of revealing knowledge gaps that justify the focus of this research. In that regard literature reviewed covered global, regional and national level. The literature aims at explaining clearly the research questions and objectives which expose the effects of climate change, and how women livelihoods are affected within the process and to assess the coping strategies.

2.2 Climate Change in Zimbabwe

Zimbabwe has not been spared by the adverse impacts due to sustained changes and variability in climate. The country is in the Sub Saharan countries in tropical Southern Africa and is landlocked. The annual mean temperatures had increased at the moment by about 0.4 degrees Celsius since 1900 and the rainfall had particularly declined by nearly 5% across the whole country (UNDP, 2007). Bohle et al., (1994) has it that in current studies results have discovered that current period up to 2080, Zimbabwe will face a decrease in reliability and the predictability of rainfall patterns while the general temperatures are expected to rise by 4°C. Echoing the same sentiments Manatsa (2010) argued that high degree of rainfall variability is the norm in Zimbabwe since it lies within the tropics to sub tropic. In addition to the above Zimbabwe’s agro-ecological zones (AEZ) have shifted severely due to the extreme effects of climate change and global warming. As concurred by Manyeruke et al., (2013), the shifting of natural regions margins experienced in Zimbabwe strongly point to climate change and variability. According to Mudzonga (2011) Zimbabwe Department of Meteorological Service states that the country is now experiencing more hot days and fewer cold days and the precipitation received is different from the mean more frequently than it used to be before. This shows that climate has changed in the country.

According to Mudzonga (2011), Zimbabwe as a country has been experiencing severe droughts every ten years since 1990 as a result of climate change. 1982, 1991/2, 2001/2002
and 2007/2008 rainfall seasons. The decline of the country’s agricultural productivity is also evidence enough for the impacts due to climate change. Mudzonga (2011) suggested that there was significance decline in the country’s maize export from 51% in 2000 to 13% in 2007. This development was influenced by climate change in terms of reduction precipitation, high temperatures and extreme hazardous weather events. The impact is greatly recognised in agriculture productivity and availability of water henceforth resulting in food shortages. The collapse of the agriculture industry has left many people unemployed especially women. Mudzonga (2011) postulated that agriculture industry employed 70% of labour force of which the majority of them are women. Manyeruke et al., (2013) propounded that about hundred and fifty million individuals in Zimbabwe lack adequate food for a healthy and balanced diet due to high food prices escalated by droughts caused by climate change.

2.3 Climate Change (Global Level)

The whole world has been affected by the impacts of climate change. Levitus et al., (2005) suggested that climate change is due to human interference. Santer et al., (2005) has it that climate change is a natural phenomenon. Arctic Climatology and Meteorology, (2008) suggested that climate change is the variation in global and regional climates over a specific time. Changes in climate can be caused by processes which are internal to the earth, external forces and human activities. America’s Climate Choices (2010) suggested that climate change is caused by several factors that include biotic processes, variations in solar, plate tectonics and volcanic eruptions.

Hulme (2004) propounded that throughout the whole world climate change involves geographical shift in weather patterns from one part of the world to another and a complete change in the frequency and the intensity in which the different weather events occur in a certain place. It involves single parameter such as temperature or rainfall, but usually accompanied by more general shifts in weather patterns which might eventually give rise to colder, wetter, and windier conditions (Burroughs, 2001). However, climate change does not necessarily change completely the weather phenomenon and in that regard changes in climate usually border along extremes hence it is globally seen as a problem.
2.4 Climate Change (Regionally)

Vulnerability and inability of Sub-Saharan countries to cope with the consequences of climate change leads to several impacts of climate which are observed in both the short-term and long term through natural hazards, such as floods and droughts and in the long-run, through the continuation of land degradation (Scholes, 2015). The adverse effects of events are being faced more in women most parts of sub-Saharan Africa, in relation to agriculture and food security; biodiversity and ecosystems. Water resources, human health, human settlements and migration patterns, and energy, transport and industry has been considered (UN, 2009).

Rural women are affected more because they have a gender role of providing family with water and firewood as a source of energy. The time consumed for gathering fire wood and fetching water increases with climate change induced water shortages and depletion of forests. Bank (2009), has it that the disparities such as socio-economic and physical resources results from the social positions of women within the African family setup and the community are affected more by the effects of climate change on the very factors that are most essential for protecting women’s means of subsistence (food, water and energy). Climate change in Africa has a potential to alter day to day livelihoods of people and their time use. Thus gender particularly being sensitive to women need to be taken into consideration in this study because they contribute to the level of impacts.

2.5 Climate Change Impact on Women

Women are vulnerable to the adverse impacts of climate change due to limited access to power and more inequitable cultural and social norms. Women are disproportionately affected by natural disasters as they experience higher rates of mortality, morbidity and post disaster diminishment in their livelihoods. UNDP (2005) has it that women suffer from climate change impacts due to high levels of inequality. IPCC (2007) subscribed that, regardless of the developing world contributing less to climate change through heavy industrialisation characterised by greenhouse gas emissions, women are always affected. UNFCCC (2007) suggested that climate change affects men and women differently depending on their roles and responsibilities in the family setup that is at household and
community level. Women in developing countries are responsible for climatically sensitive tasks, such as securing food, water and energy, which ensures food security and household well-being.

UNFCCC (2007) has it that climate change will have more effects on women, mainly because women are often regarded as poor as and less educated than their men counterpart and as a resulted they are often excluded from both political and household decision making entity. Above all, women commonly have fewer assets and depend more on the environment’s natural resources for their day to day basic livelihoods. Basing with above argument women will be always more vulnerable than men to the adverse impacts of climate change worldwide. Women are more vulnerable because of sex not because of natural weakness, but rather mainly because of the socially and culturally constructed roles given to them by the societal expectation. However, it is of great importance to find out on the resource accessibility as a contribution to the disturbance of women’s livelihoods in Mt Darwin.

The disadvantaged position of women means greater difficulty in coping with disasters. Overall, climate change is seen as magnifying existing inequalities, reinforcing the disparity between women and men in their vulnerability and capability to cope with climate change. It is for this reason that scholars like Dankelman (2002) suggested that there is need to consider studies of the relationship between gender and the environment in order to determine the gender dimension of climate change. Women in the course of their daily tasks have developed an intimate knowledge of the prevailing climatic conditions. However, their knowledge and capabilities have not been fully recognized and they often face social and economic exclusion in development issues (Ridgewell, 2008). Literature compiled by Cnnon (2007) also noted that during extreme weather conditions, women tend to work more to secure household livelihoods and subsistence needs. In a country like Cambodia where drought and flood impacts are cyclical, this commonly leaves women with little time to access training and education to develop skills or earn income. All these resources and capacities are needed to lessen their vulnerability to natural disasters

Women have been seen to be at the forefront of severe climatic change impacts. IPCC (2007) mentioned that climate change impacts are verily distributed among different generations, regions, age, income groups and gender. They are many social and political factors to this
complex issue. However, it is argued that climate change is gender neutral, meaning that it affects both men and women in the same way. However, in different scenarios, communities interact with the physical environment in a gender-differentiated way. Boserup (1989), has it that women are the gatherer and man is regarded as the hunter which was regarded as a traditional source of sustainable food supply.

Women play a critical role in actions to safeguard the natural environment, and there are their communities’ livelihoods for survival. Women have been seen to be more interactive with the physical environment as compared to their men counterpart thus putting women at the forefront of the possible implication and the adverse impacts of climate change. It is of great significance to identify how women in Mt Darwin interact with the physical environment and how that has led to their vulnerability.

2.5.1 Climate Change physical impacts on Women

In addition to the above it can be highly noted that climate change also goes as far as placing burdens on women’s health and that has always had a triple effect on women. Women are affected because of their physical vulnerabilities, their caring roles in families and work which is experienced due to depletion of the environment which strain their physical health.

Climate change causes shortage of water for domestic use at the same time severe floods due to climate change lead to outbreaks of waterborne diseases. Developing countries suffer serious health constrains mainly because of climate change effects (UNECA, 2011). UNECA (2011) argued that, Africa is one of the most vulnerable continents to climate change related health causalities due to the high levels of poverty and limited institutions to deal and manage challenges posed by climate change hence people suffer physically.

IPCC (2001) has it that rapid change in rainfall, changes in temperature and precipitation boosts the number of disease-carrying mosquitoes that lead to malaria. Climate change affect the well-being of women either directly or indirectly. For instance, climate change affects the quality of air, water and food which disturb human health indirectly. Climate change has greatly contributed in the reduction of food availability and food stability, thus eventually
affecting the calorific value of nutritional percentage of the food which will be at household level (WHO 2005).

2.6 Impact of Climate Change on Women livelihoods

By 2020, at least 75 to 250 million people, will be exposed to the ever increased water stress due to climate change (IPCC, 2001). UN Millennium Development Goals (MDGs) data, has it that 49% of the populations enjoy the availability of piped drinking water on their respective premises. In Sub Saharan Africa, only 10% of the population has reliable access to piped water (Brody, 2013). In that regard most linkages between climate change and women are associated with the adverse impacts of weather variations. Climate change has always been linked to the increase of both frequency and intensity of floods and escalated deteriorating of water quality.

In addition to that these events will result in particular unfavourable effects on girls and women because of their distinct gender roles in relation to water use and their specific vulnerabilities exposure in the context of hazards. Brody et al., (2008), has it that the time itself used during water fetching will increase as girls and women travel greater distances to find water for domestic use, thus exposing them to harassment that includes sexual assaults. Women spend less time to fulfil their domestic duties and other activities which earn them income (UNDP, 2007). Young girls especially in rural communities are usually kept home from school to help parents gathering fuel and fetch water, thus how scarcity of basic natural resources due to climate change disempower women thus negatively affecting women in diversifying their sources of livelihoods. In that regard, the way women and girls access water resource need to be of great consideration within this study.

In India, Indonesia and Bangladesh issue of migration due to climate change have resulted in alarming numbers and this has been noted especially on the livelihoods of people. This issue of climate change’s impact on employment must receive more international attention. While the need to curb climate change is now widely acknowledged, how to minimize the detrimental impact of climate change on jobs and incomes receives considerably less attention.
2.6.1 Food Security

In Africa, agriculture supports 70% of the population and responsible 30% of the continent’s Gross Domestic Product (GDP) and women play critical roles in ensuring food security and enhancing farming and agricultural productivity (Toulmin, 2009). IPCC (2007) propounded that by 2025, in Africa, yield from rain-fed agriculture could be reduced by more than 50%. It is projected that agricultural production will be compromised in many African countries, leading to severe food shortages and unbalanced diet associated with severe malnutrition. In Africa women consists of the greater percentage of population who are involved in agricultural activities whilst men are involved in commercial agricultural activities. In this regard, most women have limited access to resources such as inputs to agriculture thus contributing to the reduction in the availability of food security within Africa especially among the Female Headed Households.

FAO (2011) has it that women farmers in any event that they are given the same access to resources as their men counterparts, women’s agricultural yields holds a potential to increase by 20% to 30% leading women enhanced livelihoods and the agricultural production could rise by at least 2.5% to 4% and the rate of malnourish could be reduced by 12 to 17%. The literature reviewed has focused on empowering women particularly with resources so as to enhance women livelihood to cope with the adverse impacts of climate change but however little is known actual impacts of climate change on women regarding to food security and the available adaptive strategies.

2.6.2 Water scarcity

Africa spend one hundred and thirty-four minutes each day collecting water for household and domestic purposes. thus water scarcity increases reproductive role burden on women. UNEA (2013) defined water scarcity as the lack of available water to meet the demands of water usage within a certain area. Rosen et al., (2009) has it that quite a number of women in. According to the data collected in the UNEA research, water scarcity affects adaptation strategies of women henceforth compromising their livelihoods. The literature reviewed that community cooperative gardens whereby women practice their gardening while in groups
and produce for sale has been reduced because of limited water supply and this has affected women income levels.

2.6.3 Agriculture and Food Insecurity

Effects of climate change on agriculture undermine the sustainability of women’s livelihoods. Agriculture has been predicted to suffer the most consequences of climate change. Increased frequency, duration and intensity of droughts, excessive temperatures, and uncertain, sparse and erratic rainfall will reduce agricultural productivity. Climate change has been found to severely affect agriculture, reduce land quality and yields ultimately resulting in failure to plant at all. Chikodzi (2013), and Mano and Nhemachena, (2005) indicated that productivity of smallholder farmers that constitute the majority of farmers (more than 90% of farmers in Zimbabwe) has severely declined due to the perils of climate change.

In a research that was done in Nyakasoro village the study indicated that low rainfall trends are being caused by climate change experienced in the same area. Low rainfall ruins the livelihoods of women living in that area. Wakhungu (2010) mentioned that, 80% of African women always depend on rain fed agriculture as the major livelihood. Mudzonga (2011) propounded that agriculture sector in Zimbabwe employs 74% of the labour force which is characterised by more women. The same study indicated that the community used to depend on agricultural products but since 2002 there has been a severe decline in the harvests due to limited rainfall and shift in rainfall patterns and this has affected significantly the women livelihoods. In a research that was done in Chivi in 2009, it reviewed that nowadays rains come late and go before crops fully mature thereby eventually lead to crop failure (Madzonga, 2011). These recurrent droughts mean that women’s livelihood will be affected. Henceforth it will increase in the reproductive role burden on women mainly because of their household food responsibility.

In Zimbabwe, 70 per cent of women are smallholder farmer’s dependent on rain-fed agriculture and climate-sensitive resources (Madzwamuse, 2010). Women are therefore particularly vulnerable to the knock-on effects of climate change. For example, women in some areas of Shurugwi reported a shift in livelihood strategies to beer brewing, which led to higher alcoholism and an increase in domestic violence.
As noted in the above literature food production in Africa has been one of the critical sources of income that enables female to support their families especially those from female household-headed families. However, most experiences of drought have led to most of the families facing serious challenges in supporting their family. Girls end up withdrawing from school thereby disempowering the girl child.

2.6.4 Power and Energy

Holdrige (2001), has stated that forests occupy more than 21% of the land in Africa and this coverage is expected to decrease to about 9% mainly because of shifts in vegetation cover by the year 2050. This is mainly attributed to rapid increase in population growth and limited water supply, henceforth natural resources become depleted. In sub-Saharan Africa, 10% of the rural population has access to electricity. (Holdrige, 2001). Henceforth the rest depends on wood, for energy supply. In that regard most women spend most of their time in search of firewood. Muchemwa (2016) argued that women in rural Zimbabwe travel about 15 to 20km in search of firewood. The literature reviewed revealed that time constraints is a livelihood challenge faced by women. Henceforth the time used for searching fire wood could be used for other valuable activities like gardening and other business that could generate some income. In that regard it is clearly noted how climate change affects women livelihoods.

2.7 Chapter Summary

In this century climate change has been considered to be one of the major threats to the natural resources and people’s livelihoods affecting mainly the agricultural sector. Worldwide this has been seen increasing the threat to the living standards of several individuals especially women in rural areas for their livelihoods depend much on the natural environment for natural resources. Literature reviewed gathered, women are the ones who are mostly affected because they are involved in most of the household livelihood activities due to gender roles, hence forth women are the most affected with the impacts of climate change.
CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter has a detailed narration of the research design and methodology used for this study. It outlines the approach that was taken in gathering relevant data and information for the study. There is also presentation of data collection instruments that were employed in the study. The tools used were questionnaires, focus group discussions and interviews. Population target and sampling are also discussed.

3.2 Description of the area

The study was conducted in ward 34 of Mt Darwin District which is in Mashonaland Central province. The district has a total population of 218 724 (ZIMSTAT 2013). Mt Darwin is one of the seven districts making up Mashonaland Central Province. It is the most populated district in Mashonaland Central Province, accounting for 20% of the provincial population. Mt Darwin is situated in the North of the province and it borders with Mozambique along the Mukumbura River in the North, Rushinga in the East, Shamva in the South and Muzarabani in the West. The district is composed of two regions the upland and the lowland which is Dande. Approximately 80% of the district falls within agro-ecological regions 4 and 5 receiving rainfall between 650 and 800 millimetres per year but the lowland receives low and unreliable rainfall below 500mm per annum making crop production a failure in most years. There are 47 956 households in the District with an average membership of six (6) people per household.
3.3 Research design

Descriptive design was used in order to obtain factual data concerning effects of climate change on women livelihoods in ward 34. Interviews, focus group discussions and questionnaires were used to ensure wider coverage of the area and participation of research subjects to increase information base on effects of climate change on women livelihoods. Edmonds and Kennedy (2012) state that a research design refers to the actual structure that indicates time frame in which data will be collected and how data will be analysed.

For this study there is use of the descriptive research design. This is so because descriptive research design entails the use of sources of data which is of a qualitative nature. Kothari (2004), defines research design as the conceptual structure within which the research is carried out. It is the research design that facilitates research efficiency and collection of data at minimal costs of effort, money and time. Research design is the complete strategy which presents the overall procedures followed by the study, data to be collected, methods of data collection and how data will be analysed in solving the problem. The research design was
therefore appropriate to use as it is descriptive in nature and seeks to establish an accurate profile of the situation under study.

3.4 Research methodology
In order to gather reliable and valid data, the study employed two methodological approaches in which the qualitative approach was used to compliment the quantitative approach. According to Robson (2002), primary data contributes to the ability to address the most important issues in the research context hence primary data was collected for this study. Data collected included demographic information, respondents’ perception on climate change as well as climate change effects on their livelihoods. Qualitative has closed and open-ended questions and it is a means for exploring and understanding the meaning of individuals or groups to a social problem (Creswell 2009). A number of methods was used to gather information on the effects of climate change on women livelihoods in ward 34.

3.5 Target population
The targeted population for this study were women in Ward 34. Ward 34 has 1411 households and a total population of women is 2,386 as of 2012 census. Creswell (2007) asserts that population refers to every complete collection of research units that collectively form the research domain. Target population therefore refers to a group of individuals that have characteristics in common that are of interest to the study. A total of 137 households were sampled for this study. This constituted 10 % of the total households as argued by Saunders (2003). 137 of the women were from the Ward, one was from World Vision, two from the Ministry of Women Gender Affairs and Community Development one from AGRITEX.

Key informants
- Ministry of Women Affairs Gender and Community Development (4).
- World Vision (3).
- AGRITEX (3).

3.6 Sampling Techniques
A population sample of one hundred and thirty-seven women. Selection was done in order to meet the purpose and objectives of the research. A sample is a subdivision of larger population used where it is not feasible to include everyone (Busse 2005). A sufficient sample size is important for valid and reliable results (Leedy 2013). According to Creswell (2013) efficiency of a study relies on the sampling techniques used. Simple random sampling was used in selecting households from the ward. Random sampling technique was used to select women from each household for questionnaires and FGDs and women were picked at a regular interval. Random sampling was used because the population is large hence the characteristics are similar.

3.7 Research Methods
Research methods refer to all the methods/techniques that are used in undertaking research operations. Triangulation of data collection instruments was used in order to facilitate the validation of data. Focus Group Discussions, interviews and questionnaires were used for data collection. The use of focus group discussions (FGD), interviews and questionnaires help to collect valid and reliable data relevant to the research (Saunders 2003).

3.7.1 Questionnaire guide
In a questionnaire respondent read the questions, interpret what is expected and write down the answers. In this study, the research used a set of questions driven from the research objectives to respondents so as to obtain their views on the subject under research. A questionnaire survey was used in the study to solicit information related to women’s perceptions on climate change and how it affects their livelihoods. Leedy (2002), states that a questionnaire is a document containing questions designed to acquire information relevant for analysis. These were used because they allow respondents to provide qualitative data rich in detailed information in form of descriptions, elaborations and explanations.

Before the final survey a pilot study was done and the questionnaire was pretested in Ward 34. 15 respondents were interviewed checking on consistence, precision and easy of understanding, and to observe time of completion. During this pilot study, the questionnaire was tested and weaknesses were identified and adjusted. Household members targeted were women who suffer more from climate change. A structured questionnaire consisting of both closed and open-ended questions was administered to the selected households. The
questionnaires enabled translation of research objectives into specific questions to be answered. To ensure the best possible data quality the questionnaire was conducted as one on one interview. With the research assistants (4), there was translation of questionnaire from English to Shona to ensure that the terms used could be easily understood and to have a similar meaning. Standardized questions and response format of the questionnaires ensured that every participant responded in identical format to facilitated easy results interpretation, presentation, analysis and discussion of findings. The use of questionnaires made it flexible for respondents in terms of time disruption of daily activities.

3.7.2 Focus group discussions

A focus group discussion was conducted to source in-depth information from women in regard to effects of climate change on their livelihoods. According to Barbie and Mouton, (2007) this type of research gives a more description and understanding of events of actions to help in gaining insight of why and how events or actions take place rather than just presenting a phenomenon. Women were divided into two groups so that the discussion could be maintained and reduce cases of disputes. The FGD focused on rapport building and then its major objective of identifying how the climate has affected their livelihoods. It also looked at the existing gender relations especially in the various livelihood strategies women have adopted.

3.7.3 Interview guide

Interviews are very common research tool in social sciences because they attract a great deal of commentary and discussion. Women were asked questions by the interviewer concerning the study topic. Interviews can be formal, informal, structured, semi-structured and unstructured. There was use of interviews to examine the effects of climate change on women. Structured interviews were designed to allow homogeneous questions to be asked to the respondents to see their different views and acquire first-hand information. The interviews enabled the observation of feelings and emotions of participants through facial expressions, gestures and other body language. They also helped to describe situations in depth while at the same time offering opportunities for probing and clarification. Personal
interviews enabled clarification of questions to eliminate challenges posed by illiteracy. Key informant interviews were conducted with Ministry of Women Affairs, Gender and Community Development, AGRITEX and World Vison Enterprise so as to find out more information concerning CC effects on women livelihoods in ward 34.

3.8 Reliability and Validity

According to Hussey (2007), validity is defined as a degree to which a research study measures what it intends to measure. To determine the validity of the instrument a pilot study was conducted. The pilot study was done to enable the examination of questionnaire wording, sequencing and layout. It also helped to assess fieldwork arrangements through familiarising with respondents, estimating response rates and the time the questionnaire takes to complete.

3.9 Ethical considerations

While conducting the research, adherence to various principles such as permission, informed consent, the right to privacy and considering local traditional cultures was done. Consent of the interviewees for them to proceed with the interviews was seek. Ethics refer to the rules and principles of right and wrong accepted by an individual or a social group with respect to certain actions and to the badness or goodness of the motives and ends of such actions (Roy 2002). These ethics helped in making sure that the research was carried out peacefully. The research maintained confidentiality of participants through promoting anonymity. Permission to carry out the study was sought from the District Administrator, councillor and headman. To engage married women in research interviews, permission was sought from their husbands.

3.10 Chapter summary

This chapter discussed research design and research instruments as well as sampling techniques which were used for data collection. The research was designed in a way that it accommodates both qualitative and quantitative methods, although qualitative research was dominant. Quantitative data were coded to allow statistical analysis using Microsoft excel.
The data was then presented using a bar graph, tables and pie charts. Research instruments discussed include questionnaires, interviews and focused group discussions.
CHAPTER FOUR

RESULTS, PRESENTATION AND DISCUSSION

4.1 Introduction
This chapter presents and discusses key findings of this research. Data analysis in this chapter involves a combination of narrative and interpretive techniques. The sections within this chapter include the description of the effects of climate change on women livelihoods in ward 34 of Mt Darwin district.

4.2 Demographic profile study respondents

This section looks at the demographic characteristics of the respondents in ward 34. The characteristics include age, level of education and marital status of the respondents. The respondents were women from the ward and the key informants were women from World Vision, AGRITEX, Ministry of Women Affairs Gender and Community Development. The study excluded men because it was mainly focused on the effects of climatic change on women.

4.2.1 Respondents age groups

![Age range of the respondents](image)

(N=137)

Figure 4.1 Age range of the respondents Source (research data)
Figure 4.1 indicates that majority of (60%) of respondents were in the 26 to 45 years age group. Those of age between 46 and 65 consisted 28% of the respondents. This is so because these two groups with the highest number of respondents commonly constitute economically active people in the community and they are the main labour forces in the study area. The result of this study confirms the findings of Phuong (2012) and Crentsil (2013) whose studies in northern Ghana concluded that women are the labour force in agricultural activities. The elderly 66 years and above consisted 4% of the respondents and were also included in the research to access their valuable indigenous knowledge built over years of experience and witness on the effects of climate on women. They were consulted as supported by Tazeze et al., (2012) who stated that strategies increase with experience gained with age. As supported by Chanza (2014), indigenous knowledge is of great importance as it compliments scientific knowledge in reducing vulnerability of households to climate variability and change impacts on farming practices.

Figure 4.2 marital status of respondents

4.2.3 Respondents marital status

The pie chart shows 63% of the respondents were married while the widows constituted 17%, divorced 12% and single 8%. The inference of the result is that married women being the dominant group of respondents are more likely to withstand climatic shocks than the other
groups because they can combine efficiently and provide resources (financial and human) to design appropriate coping strategies for themselves and family members (Lopez, 2008). Married women are available and they do not migrate due to traditional gender roles which state that men are the ones who must respond to severe economic impacts of climate change by migrating. Livelihoods for single, widowed and divorced women are more vulnerable to effects of climate change the reason being they lack physical and financial capital to improve their lives (Chazovachii 2007). Singles constitute the least percentage because they are most likely to migrate since they have freedom in venturing into a trade or cross border businesses without family restrictions or societal expectations.

![Figure 4.3 level of education source (primary data)](image)

### 4.2.4 Respondents level of education

From the research, the majority of the women attained primary and secondary education constituting 51% and 23% respectively. ZJC constituted 20% and tertiary level (8%). The results meant that girls have the highest probability of being affected by climate change because they drop out of school for an early marriage to raise money for the family’s upkeep. It can be deduced that those who attended secondary and tertiary have more knowledge on climate change and are more likely to take action meant to reduce the effects climate change on their livelihoods unlike those who acquired primary education. As argued by Mugi-Ngenga et al., (2016), the level of education determines women’s uptake of farming types and how they respond to climate change hence households with high education levels make
better decisions in their farming livelihood. Balama et al., (2016) also acknowledges the positive influence of education and experience on better knowledge and information regarding climate.

4.3 Climate change knowledge

Table 4.1: Climate change knowledge

<table>
<thead>
<tr>
<th></th>
<th>Aware</th>
<th>Not aware</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency</strong></td>
<td>104</td>
<td>33</td>
</tr>
<tr>
<td><strong>Percentage</strong></td>
<td>76</td>
<td>24</td>
</tr>
</tbody>
</table>

Source primary data (n=137)

Majority of the respondents acknowledged that climate change was real. The response indicated that 76% of the respondents had full knowledge of the existence of climate change. During FDGs women explained how the effects of change have affected their livelihoods and emphasis was put on the poor harvest brought about by climate in the previous years. However, some respondents (24%) showed ignorance of climate change indicating that there is no climate change to worry about as they associated change it with politics. From the questionnaire guide, respondents who were aware defined climate change as the existing period of bad weather like drought, floods and the scarcity of basic commodities. Low level of education affects awareness and contributes to poor environmental management. Women can contribute to advancing desertification because of ignorance. Their adaptive capacity is also affected by low levels of education because they do not understand what climate change is all about. According to the research those who have low education levels often have invaluable knowledge about adapting to negative environmental changes. If they can get involved in some training related to disaster preparedness, coping capacity including resilience capacity will become better. Lack of knowledge is a problem rural women face in expanding and working towards the success and sustainability of their livelihoods.
4.4 Women livelihoods in Ward 34 of Mt Darwin.

Figure 4.4 livelihood activities in Ward 34  
(Source: Primary data) n=137

4.4.1 Agriculture and livestock production
From the graph agricultural activities consist of the major source of livelihoods in ward 34 with 90% of the women practising it. As proposed by Sharma et al., (2014), farming is commonly practiced by most of the communal people in the developing world, particularly in sub-Saharan Africa. Livestock rearing also constitutes 60% and these two are the major sources of livelihoods of women in ward 34. Livestock kept include goats, pigs and cattle which can be traded at the market to purchase food in years of food shortages. 60% in livestock production has a ratio of 2:3 with that of food crop production the reason being the breed of animals is poorly resistant to climate change, grazing pastures are now scarce hence they incur great loss if they venture more into that. The animals are also affected by nagana and ticks.

The study discovered that farming provides the community members with food for domestic use and if surplus they sell in surrounding communities like Nyombwe. They also grow crops like maize, sorghum, millet, rapoko, sweet potatoes and cowpeas but they are facing
challenges of weevils and animals that destroy their farm produce. This year they have experienced army worms that completely destroy the food crops before they even mature. 50% of the respondents are into gardening and it is one of the livelihoods that provide most relish for the households through the growing of vegetables like tomatoes, rape, onions and sugar loaf. Vegetables are also sold to generate income at household level. Women in ward 34 grow sweet potatoes which they trade in exchange of grain with people from Nyombwe. The vegetables are sold in public markets, Mt Darwin and Bindura and they are able to buy mealie meal, salt, soaps, school fees, clothes and other basic commodities.

The implication of agriculture consisting the major source of livelihood means that the majority of the female farmers are exposed to the risk of losing their livelihoods from the agricultural sector in the face of a changing climate. The results of this study is consistent with the work of Fosu-Mensah et al., (2012) and Sagoe (2006) who posited that female farmers stand the risk of losing their livelihoods from the agricultural sector because of climate change and the fact that they are mostly involved in food production with inadequate inputs and resources.

4.4.2 Vending and fast food outlets

The research discovered that there are also women involved in vending and fast food outlets business. Vending constitutes selling of items such airtime and vegetables. From the FDGs several women acknowledged that they are earning a living through growing, buying and selling of commodities especially basic commodities. These livelihoods provide women with money to buy basic needs for their families. NGOs like World Vision are having their food aid and dip tank construction projects in the area and these are the regular customers for women who are into fast food outlets business. They sell sadza, rice and potato chips both to the local people and the World Vision team. One of the women stated that;

“I thank God for these World Vision field work officers because they have helped me to think outside the box and start my own food take-away and it has increased my income”.

This means that they are earning money at a regular interval because the food programme has been ongoing since October 2017. The projects are monitored three to four times a day hence it is to these women’s advantage. This livelihood also generates jobs for other women who cook the food, local gardeners and those who keep chicken. Their businesses are also promoted as their products are needed for the survival and sustainability of the food outlets.
Plate 4.1 Woman owned grocery store on the left and on the right a woman selling fast foods (primary source)

4.4.3 Salary/wages

The research has it that 23% of women are formally employed. A notable number of females in ward 34 are qualified teachers and nurses in the neighbouring schools and clinics. Formal employment results in improvement of capacities and income within households. They are able to migrate to other areas in search of greener pastures because they have the financial and physical capacity to do so. Formally employed women also provide jobs for girls and women as house maids thereby reducing levels of poverty. Most of the women employed by the government own grocery stores hence livelihood diversification. Related to Olutegbe and Fadairo, (2016) findings, the more educated households are, the more they diversify their livelihoods. The study also gathered that some women depend on their children and relative in the diaspora, Bindura, Harare and Mt Darwin as they often send them money in form of remittances.

4.4.4 Sewing, fruit gathering and poultry

Findings indicated that there is existence of sewing, wild fruit gathering and poultry especially the indigenous chicken among women in ward 34. Women are into sewing of garments for the Vapositori sect who frequently have their annual conferences in ward 34. Others sew uniforms for their children and the community at large. Gathering of wild fruits like “masawu”, “mawuyu” and other wild berries supplement family food and income as they can be sold for cash or exchanged with other food items. However, Sango and Godwell
(2015) argue that these wild fruits were becoming uncommon due to variations and changes in climate conditions affecting their natural recovery.

22% of the livelihood activities in ward 34 is poultry and women are specifying on keeping indigenous as compared to the broilers. These chicken are more resistant to diseases and they reproduce at a fast rate. They sell the chickens to those who are into food outlet livelihoods hence earning a profit. During FGDs it was noticed that this livelihood is done by those women whose age ranges from 46-65. This is because they do not have any reliable and formal source of income for their survival due to lack of education. Money to purchase food for themselves in case the poultry project does not materialise is acquired from remittances;

“My daughter is my only hope because she sends me money for my upkeep, in case the chickens do not give me expected profits then I have another source of income”.

This means that remittance is one of their sources of livelihood for these women. They have children who work elsewhere and they send money to their families to sustain life and venture into new sources of livelihoods.

4.4.5 Basket making and sand abstraction

From the data gathered through household questionnaires, basket making and sand abstraction are the least practised livelihood activities with 5% and 4% respectively. Some of the women are involved in sand harvesting on their farms, along the road sides and dried rivers. Rivers are drying up thereby allowing women to take advantage and sell the sand for construction purposes. Sand abstraction has a low percentage because it is a labour intensive activity and this has a negative impact on women’s health. Even culturally, it is surprising to see a woman venturing in livelihoods that are characterised as those for men by the society. Women are not as strong as their male counterparts. With rivers drying up, availability of reeds for basket making is limited hence the low percentage.

4.5 Effects of climate change on women livelihoods

4.5.1 Water Scarcity

The study revealed that women livelihoods negatively affected by climate change constitute about 99% according to the respondents’ information. The natural capital such as land, forest and water bodies are very important to the rural populace since they derive their livelihoods from resource based activities such as farming, fishing and gathering in the forest. This is in
agreement with Chanza (2014) who presented a general shift of the rainy season since the pre
1970s to the post 1990s, hence a clear indication of changing climate. From the key findings
of the study the majority (72%) of respondents mentioned that women contribute a greater
proportion of individuals who fetch water. However, the research found out that even men
help women in fetching water but women mostly are responsible for fetching water in Mt
Darwin. This is mainly because of the societal expectations and gender roles the
responsibility of fetching water at household level is for women hence due to climate change
there is massive shortage of water for domestic purposes. In that regard women are more
susceptible to water scarcity related impacts for they make up the large percentage involved
in fetching water.

Drying up of water bodies including community boreholes, rivers wells and streams were
very evident in the study area. The key findings of the research have it that due to shortage of
adequate rainfall, boreholes are drying up in Mt Darwin ward 34 and this forces women to
travel long distances to fetch water for domestic use. A majority 80% of the respondents from
both the focus group discussions and the questionnaire survey concurred with AGRITEX’s
notion that climate change accounts for reduced water supply. Brody et al., (2008) articulated
that climate change has led to water scarcity as a result of the drying up of water sources.

As a result, water scarcity has consequently compelled women to walk longer distances in
search of water same with the findings of Adger (2000). Such long distances have negative
effects on the health of women. Rosen et al., (2009) reviewed that women in Africa spend
one hundred and thirty-four minutes per single day in collecting water for domestic uses. The
respondents indicated that the beginning of the rainy season is now a cause for concern.
Water tables are declining and this has had unfavourable effects on accessing borehole water.
In the focus group discussions, women echoed that reduced water supply is posing as a
setback in their vegetable gardening as evidenced by dried “mifuku” at an alarmingly rate as
said by one woman during the FGD;

“Zuva rakupisa kwenguva yakarebesa, taimborarama nemifuku asi mazuvano ukakafukura
mvura yacho haibvinine”,

This shows that the water table has dropped drastically hence their last resort for usable
water is drying up rapidly. Water scarcity also has affected women who depended on fishing
as a source of livelihood as the rivers are drying up so does the fish go into extinction in the
area at large.
4.5.2 Energy Scarcity

There are shifts in vegetation zones and this is because with population growth, natural resources become depleted. Basically wood based energy has been affected since woodlands depend highly on natural water supply hence affecting the availability of fuel. Holdrige et al., (2001) argues that in sub-Saharan Africa, less than 10% of the rural population has access to electricity hence the majority depends on wood, charcoal and dung as energy sources. Source of energy is one of the basic need that is affected by climate change specifically firewood. Due the depletion of vegetation in ward 34 because of insufficient rainfall and rapid deforestation, women are responsible for the search of firewood for domestic use. A total of 65% of the respondents suggested fuel wood scarcity demand women and children’s time, limiting their opportunities for income generating livelihoods.

Most of these women depend on wood fuels for cooking hence more time is spent looking for wood instead of embarking on other livelihoods. Shortage of firewood has negatively affected those who are into food outlets because that is their source of fuel for cooking. They no longer meet the target per day hence affecting income levels. The negative consequence of deforestation is that it increases the time women use for fetching firewood as they will be in scarcity. The time devoted to searching wood fuels could be used for other valuable livelihood activities like basket making, garment sewing, watering their vegetables and other business that could generate some income for their households.

Through the varied data collection methods used, FGDs and household questionnaires, it was discovered that increase in the fuel wood collection time force the girl child to drop out of schools in ward 34 to assist their parents with domestic chores, thus disturbing their education. The withdrawal of girls from school as a result of climate change helps to explain why the majority of women acquired primary education. As a result, women are more affected by climate change and variability impacts than men.

4.5.3 Agriculture and food insecurity

Basing on the key findings of the study, low rainfall experienced in ward 34 due to climate change affects women livelihoods to the fullest. The respondents alluded that 71% the women in ward 34 depended on rain fed agriculture as the form of their income and food supply. Mudzonga (2011) agreed that agriculture sector employs more than 78% of the labour
force of which the majority of them are women. The responses gathered from the FGDs indicated that women used to depend on agricultural activities such as maize, and groundnuts for sales but for the past 10 years there has been a rapid decline in the agriculture output as a whole due to limited rainfall and shift in rainfall patterns and this has affected food security income levels in ward 34. Similar to the findings of Phuong, (2012), the relationship between the natural capital and climate change are so close that such shocks destroy the livelihoods of the rural women who largely depend on climate sensitive sectors, such as agriculture. From the household questionnaire survey conducted in ward 34, there is evidence that a shift in temperature in Dande exists as highlighted by one elderly woman. She stated that;

“Makare kare edu zuva raipisa rikasvika pakugocha tichiti zvichapera asi ikozvino tanzwa naro tangoshiwa nezuva”,

This shows that level of temperature has escalated beyond her imagination. In addition, the rainfall patterns have changed and the rain does not last for the expected duration or for the period they used to know. The rain comes late and it stops before crops like maize could fully mature hence leading to crop failure. The frequent droughts in Dande district shows that sustainability of women’s livelihoods has been undermined. During FGDs, women were asked to give an approximate of how much they harvested and how much they have stored in their reserves as food and seed sources but it was surprising that majority said they have harvested nothing because of poor rainfall received. Women are surviving on aid from donors like World Vision through the Lean Season Assistance (LSA) project.

Similar to the findings of Dube et al., (2016), most marginal and vulnerable communities farming is rain-fed and depends entirely on natural systems hence as a result of inadequate rainfall the agricultural activities have been affected drastically. Eventually this reduced the income generation rate of women because climate change has made everything stand still in the farming industry. Changes in rainfall patterns and increased temperatures bring about pests and diseases. Unavailability of nutrients on agricultural land has resulted in low yields. Existence of sticky unfertile soil reduces yields as stated by respondents during a FGD;

“Fukamburu ivhu rinowanikwa mumabhande-bhande emuminda riri kuwedzera razara mumagadhe ese”.

From the questionnaire guide, climate change affects productivity of the soil hence eroding livelihoods bit by bit. Their livelihood of vending has been drastically affected since climate change results in pests like red spider which spreads over the area which affects tomatoes and
vegetables. The sales are dropping and this has an effect on those who sell fast foods as they need the tomatoes for food preparation. According to the information recorded in the questionnaires and the FGDs, women highlighted that CC has affected their eating patterns because of limited food. The household meals are coming in the afternoon and in the evening and sometimes only once a day. Children are going to school without eating anything because of low food production. A reduction in field output means that a decrease in income is also affected to the extent of eating relish without cooking oil because there is no money to purchase food items. There is too much workload because of diversified ways to get money so that we find food to eat. As strongly pointed by one woman during the FGDs;

“Nzara, hondo nematongerwo enyika hazvisiyane ndochikonzero tiri kutambura. Kushaikwa kwechekudya kwakutiwanzira basa nekulikanganisa mafungiro. Unopedzisira wakutsvaga tsvaga twakawanda twekuita nekuti ukagara semunhu wemukadzi baba vanobva varemerwa”.

Also, during data collection it was noticed that most of the women are relating food insecurity and climate change to the period of elections which is approaching. They agreed that each year Zimbabwe has elections, people suffer drastically in terms of food insecurity and high temperatures. Due to household food responsibility of women in ward 34, majority of the women are now engaged in diversification of livelihoods which is also a positive effect of climatic change.

4.5.4 Livestock production

Temperature extremes affect general livestock performance. Respondents from both the questionnaires and FDGs agreed that high temperatures promote pests and diseases such as nagana, anthrax and ticks thereby reducing the general immunity of the animal. Three of the respondents observed that ticks cause poor fertility in livestock and their general appearance become unpleasant such that when one decides to do livestock selling, the market value is greatly resulting in losses.

As recorded from the focus group discussions, most women complained about their cattle and pigs dying because of dehydration and poor grazing pastures. For women without the financial capital for purchasing animal medication, livestock loss is exacerbated. Most of the respondents highlighted that high temperatures encourage higher rates of evapotranspiration therefore a rapid diminishing of water in the livestock body systems. Two of the respondents
from the focus group discussion highlighted that livestock productivity has been affected since the grazing lands for livestock have been extremely reduced in quality and size.

Poor feeding patterns for livestock have resulted in reduced milk and meat production hence affecting food security, sales and income. As a result of poor food intake for livestock, labour providing animals such as donkeys and cattle have been affected having a negative impact on labour supply for women. During the planting season women are finding it difficult to meet their targets hence their output is compromised. Scarcity of waterholes increases competition for water sources thereby affecting women livelihoods because of increased distance in search of water for livestock to drink. Time consumed while searching for waterholes should be time for upgrading and maintenance of livelihoods. It is valuable to note that in all the focus group discussions women corresponded that water scarcity due to climate change accounts for more than half of livestock deaths hence contributing to low sales and heightened poverty for women.

4.5.5 Health and market linkages of livelihoods

Climate change including climate variability has multiple influence on issues to do with health. It has direct and indirect effects on the physical, social and psychological health of humans. Conditions are becoming more favorable for diseases like malaria to increase in prevalence and frequency due to increased temperature. The study recorded more female respondents (about 72 per cent) being worried about the effect of climate change on health because of the reproductive roles assigned to them by society. If people are not healthy then their working capacity is affected leading to low production. Poor food quality is an issue of concern because women are affected in terms of income as their working capacity would have diminished. 45% of the women are of the view that too much heat decreases working capacity as they echoed on the sentiment that;

“Zuva rinodzikisa mafuta haukore richingokungosha-ngosha kana kushanda haushande nekuti unenge wakafizuka”.

Climate change impacts distort social capital of the rural women by forcing migration of their husbands in search of greener pastures and sometimes death from under nourishment because of poor diet leading to breaking up of families and associations that promotes livelihood development. Some of their husbands do not return hence affecting women psychologically.
As recorded from widows, divorced and single women in ward 34, death of their husbands and abandonment due to CC effects has affected them socially, psychologically and physically. Those women who have husbands can better cope with climate change effects unlike the widowed, single and divorced hence on noticing this, women are emotionally broken down and they do not see the reason for continued progress in terms of livelihoods.

Physical capitals are the basic infrastructure and producer goods needed to support livelihoods like affordable transport, secure shelter and buildings. IPCC (2001) states that, impacts of climate change would not only be restricted to agriculture and food security, but extends to the destruction of basic infrastructure such as shelter and buildings hence climate change impacts on physical capital cannot be ignored. Climate change effects on shelter and public infrastructure such as roads and markets affect women livelihoods. The roads are badly damaged because of climate change hence no company wants to invest its funds in ward 34. Roads have potholes and bridges are swept away hence buses no longer go there. Lack of markets locally to sell their products has made them realise more loss than profits because most of the profit will be diverted towards transport costs. Mpofu (2011) posits that destruction of road links makes transport network and accessibility to the affected communities difficult hindering progress in women’s sales. When they want to sell their livestock they have to strike a deal with commuter drivers so that they are provided with transport and the women give the driver a portion of the meat hence reducing their profits. There is need to build local knowledge base by identifying information gaps on climate change effects on women livelihoods thereby helping in the recognition of educational needs of communities and focusing health interventions meant to reduce the health hazards of climate change.

However, climate change has somehow affected women in ward 34 in a positive way because it has forced them to think outside the box. If it was not for climate change women in ward 34 would not have thought of venturing into food outlet business because from the research findings, all along women thought it was a source of livelihood for those who live in urban areas as they have access to electricity, better facilities and variety but now they are earning an income because they decided to diversify their livelihoods along those lines. From past years, women were always subjective to their husbands and they only waited for whatever the man brings home but now everyone has a role to play in making sure that basic commodities are available at household level and this is also supported by DFID (2000) which states that climate change also includes competencies and attributes embodied in people that facilitate
creation of personal, social and economic well-beings as well as motivation, behaviour, physical and emotional attributes and mental health. From the discussions it was observed that climate change is an eye opener to most of the women as they have taken advantage of the border post which is located near to their village by buying clothes and selling to earn money.

4.6 Coping strategies to reduce climate change impacts on women

4.6.1 Switching to Drought Resistant Crops and crop diversification

With the understanding that climate change is a phenomenon which is projected to exist for a long period with its adverse effects, people have seen the need to employ adaptive strategies as a means of lessening the effects of climate change. Varying coping strategies were highlighted as being employed by women in the ward. It emerged that the growing of drought tolerant small grains such and leguminous crops like round nuts, groundnuts and cow peas is on the increase in Dande. It was discovered that growing of legumes is being done by women and the society calls them women’s crops because they are meant for women. Most of the women farmers in ward 34 shifted from growing long grains such as maize and are now opting for tolerant crops such as rapoko, millet, bulrush and sorghum.

The most popular coping strategies in ward 34 include planting short season varieties and crop diversification. According to Nhemachena (2007), the main thrust of these strategies is increased diversification and escaping sensitive growth stages through crop management practices that ensure critical crop growth stages do not match with harsh climatic conditions in the season such as mid-season droughts. Crop diversification improves household food security since different crops are affected differently by the same climatic conditions. Also, given the high frequency of mid-season dry spells and shortening of the rain season, farmers grow short season and drought-resistant crop varieties, such as finger millet, cowpeas, rapoko and sorghum. This finding has been substantiated by Chazovachi et al., (2012) who argued that such crops are not only drought resistant but tend to be resistant to pests and diseases that may threaten them. These small grains also provide ingredients for traditional beer brewing therefore coming up with an alternative source of income for many women who brew it. Quite a number of respondents testified that beer brewing is done by women on the basis that they have deeper knowledge on how to prepare the beer. However, people do not want to
fully embrace this strategy because of poor market linkages and the process being labour intensive.

4.6.2 Conservation agriculture

From the interviews done with key informants (World Vision Enterprise, AGRITEX and Ministry of Women Affairs Gender and Community Development women officers) key findings of the research indicated that that due to low water retention level of the soil in the area, most farmers are only left with practicing zero tillage which helps them improve and conserve water in the ground. This practise is locally known as “timba ugute”. Timba Ugute strategy was introduced by NGOs such as World Vision and AGRITEX so as to enhance food security in drought prone areas like ward 34. The response from key informants indicated that most of the women are now practising tillage as NGOs like World Vision are providing input and good training to these women for the practise to be successful. This is a necessary intervention to the agricultural production challenges affecting women livelihoods.

Interviews conducted also revealed that the strategy is carried out using the environmentally-friendly natural resources such as cattle manure. Cultivation and yields of indigenous drought tolerant varieties like cow peas, groundnuts, bulrush, finger millet and sorghum has been a success according to their records. Three quarters from the household questionnaire survey were in agreement that Timba Ugute has helped to restore a part of the degraded soils and reduce dependence on food aid provided by the NGOS.

4.6.3 Humanitarian assistance

Interviews held with key informants also revealed that there are a number of charity-based organisations that are active and vibrant in ward 34 that assist people to safeguard their livelihoods especially farming. Examples of these NGOs include World Vision and Christian Care. They are assisting women with the provision of inputs, training and financial support in terms of co-operatives w to offset food shortages due to recurrent poor harvests. A number of female participants reported that. It was also noted that several organisation including and Ministry of Women Affairs are taking part in improving climate change adaptation strategies by regular training on the possibility of diverting livelihood from rain fed agriculture to small livestock production and ISALs.

Related to the observation by Dube et al., (2016), as the climate conditions continue to change for the worse, households also continue to diversify their livelihoods. Nutrition
gardens locally have been revived through boreholes drilled and rehabilitated and underground wells to reduce water scarcity which is affecting production level of their gardens. Some cooperative groups like Kuringa, Kushinga and Chezita under World Vision have been established to support women financially in diversifying their livelihoods. These nutritive gardens and co-operatives have helped them to adapt to the impacts of climate change. Results from Muzari et al. (2016) supports that having diverse livelihoods is critical in responding to climate change since mitigation takes a long time to realise benefits.

### 4.7 Challenges faced by women in effectiveness of livelihoods

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Labour intensive</td>
<td>63%</td>
</tr>
<tr>
<td>Lack of freedom of action</td>
<td>20%</td>
</tr>
<tr>
<td>Lack of education</td>
<td>14%</td>
</tr>
<tr>
<td>Birds</td>
<td>80%</td>
</tr>
</tbody>
</table>

**Figure 4.3 challenges of livelihood effectiveness: Source (primary data)**

Women are often excluded from participation in the overall policy-making process related to agricultural extension work and land conservation development projects. During FGDs women were asked why their livelihoods are vulnerable to climate change. The majority 80% responded that lack of freedom of actions as a result of disempowerment over their own lives has made their livelihoods more vulnerable to the effects of climate change. Rural women are so keen to learn something that if a sensitizing campaign is planned in remote areas like Ward
34, women are willing to take part but exclusion from participating in decision makings is a major challenge.

Women cannot participate in clubs and projects without the consent of their husbands and as a result women are limited to realise their capacity opportunities for other livelihood activities. These results resonate with Ellis (2000) who found that women do not have rights to engage in their own account farming or other income generating activities without the consent of their husbands. 63% shows that education is another challenge and from the results obtained from household questionnaires, women with knowledge on climate change take action to reduce the effects of climate change on their livelihoods by adopting the coping strategies unlike those who attained primary education. From household questionnaires and FGDs conducted in ward 34, primary education constitutes 51% and that explains why their livelihoods are more vulnerable.

From the pie chart 21% shows that growing of drought resistant crops, conservation agriculture and sand abstraction are labour intensive. Despite their potential effectiveness in addressing effects of climate change, soil and water conservation strategies require much labour and appropriate training of farmers. External support from governmental organizations and development agencies is therefore required to implement soil and water conservation projects.14% of farmers identified quelea birds as a major challenge to small grain yields.

4.8 Conclusion
The study identified women livelihoods in ward 34 and how climate change has affected them. The chapter presented, analysed and discussed research findings. It also discovered that most of the women’s livelihoods are agro based hence their income is affected. However, climate change has given women a chance to think outside the box therefore livelihood diversification was reached.
CHAPTER FIVE
CONCLUSION AND RECOMMENDATIONS

5.1 Introduction
This chapter summarizes, concludes and suggests recommendations in regard to the study on effects of climate change on women livelihoods in ward 34. The study gives the summary of the research, the achievement of research objectives and the conclusions arising from the key findings. This study seeks to satisfy and answer issues raised by the project objectives. It also draws conclusion from the analysed data so as to answer the problem in discussion. Recommendations were made with respect to key findings.

5.2 Summary
The study managed to examine how the effects of climate change have affected women livelihoods in Ward 34. The introductory of the study gives the flow of research which includes background of the study, statement of the problem, research objectives and research questions. Agricultural livelihoods constitute 90% and this has an impact on income levels as the agricultural sector is mostly affected by climate change. The study revealed that women livelihoods negatively affected by climate change constitute about 99% according to the respondents’ information. A positive effect of climate change was observed which is making women realise their potential through diversifying their livelihood activities. The study also helped in determining the problems being faced by the women in ward 34 due to climate change and how the copying strategies have helped them in reducing these impacts so as to build a better future for these women as they are an important part of the society. The study used a case study research design and adopted the use of qualitative methods. The attempt was to build a local knowledge base by identifying information gaps on climate change effects on women livelihoods thereby helping in the recognition of educational needs of communities and focusing health interventions meant to reduce the health hazards of climate change.

The study also revealed that in as much as women may try their best in safeguarding their livelihoods through coping strategies, different aspects come in as stumbling blocks in dragging them behind. A number of barriers were noted during the study and the respondents indicated that lack of decision making power, lack of education and access to information that would allow women to manage climate-related threats to agriculture. 80% of the respondents were of this same view. All respondents acknowledged that one of the driving
factors which limit public participation is lack of freedom from their husbands. The above barriers amongst others indicate that only 37% of the respondents are not affected by the issues of decision making because their families are female headed whilst 63% is affected because their husbands decide for them hence their participation is low. From the study it was discovered that women are often excluded from participation in the general policy-making process related to agricultural extension work. With climate change natural resources become depleted and this drives women away from income-generating activities therefore resulting in high poverty levels. Farming alone cannot sustain rural families hence the off-farm livelihoods is a progressively important source of household.

5.3 Conclusion
Climate change is a relevant issue affecting the livelihoods increasing human suffering due to the damage and depletion of natural resource base on which most livelihoods depend. The effects of climate change are directly related to community livelihoods. Even though climate change is not of a discriminatory nature, women are at the forefront hence they experience the effects more severely than men because of existing gender disparities. Women do not have access to physical, natural, social and financial capital essential for climate change adaptation. It is hoped that some of the findings can be useful for researchers and decision makers in helping to determine policies and allocating priorities for interventions in rural areas. Even though women in ward 34 have adopted the coping strategies to secure their livelihoods, they are facing challenges to make sure that ends meet.

5.4 RECOMENDATIONS
- Building on and strengthening women’s experiences, knowledge and coping capacities in adaptation policies and ensuring that women’s needs and interests are fused in livelihood adaptation strategies through provision of training organizations for women and support groups where they can share knowledge and experiences about climate change issues hence sustaining their livelihoods.
- To encourage women farmers, AGRITEX and government to reward hardworking farmers during field days so that women in ward 34 will gladly embrace the adaptation and coping strategies with the motive of being rewarded hence reducing food insecurity.
• The government should expand and introduce command small grain crop production in drought prone areas like ward 34 and at the same time creating market linkages for these crops.

• There is need for economic empowerment of women to help them gain power, freedom of actions and control over their lives to reduce economic dependence over their husbands. The government should ensure women’s access, ownership and control of resources like land, livestock and income opportunities. This can also be done through the development of resources such as credit services in order to curb the financial constraints.

• Ministries should create livelihood opportunities like capacitated clubs for women in rural areas like ward 34 especially women-headed households in order to build their capacity to cope with climate change stresses and uncertainties on local livelihoods hence increasing their adaptive capacity to the impacts of climate change.

• Gender based climate change awareness training should be targeted at all members of local households, with a special focus on women and girls since these two groups tend to be overlooked but face particular vulnerabilities.

• Local authorities and civic society organizations should encourage the involvement of women in all management structures and processes in order to promote their rights as well as to safeguard increased representation of women at decision-making levels.

• From the study findings it was noticed that the government and private sector should promote the growing of open pollinated varieties (OPVs) so that women farmers acquire both grain and seeds from their produce.
REFERENCE


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APPENDIX 1 Questionnaire

Questionnaire guide

I am Lindsay T. Dzungu a fourth year student at Bindura University of Science Education doing Bachelor of Science Honours Degree in Disaster Management. It is a prerequisite for final year students to undertake research project and I am carrying out a research on **THE EFFECTS OF CLIMATE CHANGE ON WOMEN LIVELIHOODS IN WARD 34 OF MT DARWIN**. I am appealing for your assistance, contributions and relevant information regarding to the study. The aim is to understand your knowledge, experience and perceptions of climate change related issues. Responses will be strictly presented privately and confidential to pursue academic fulfilment.

Instructions:

- Please fill in the space provided
- Place a tick where appropriate

SECTION A: DEMOGRAPHIC DATA

1. Age group

<table>
<thead>
<tr>
<th>Below 25 years</th>
<th>26-45 years</th>
<th>46-65 years</th>
<th>66 and above</th>
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2. Marital status

<table>
<thead>
<tr>
<th>Single</th>
<th>Married</th>
<th>Divorced</th>
<th>Separated</th>
<th>Widowed</th>
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</table>

3. Level of education

Primary □        ZJC □        “O” Level □        “A” Level □

Other (state)................................

4. Household/family size


5. How long have you lived in Mt Darwin? □
6. What is your main source of livelihood (income earning activity)?

<table>
<thead>
<tr>
<th>LIVELIHOOD</th>
<th>LIVELIHOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Livestock production/sales</td>
<td>Food crop production/sales</td>
</tr>
<tr>
<td>Cash crop production/sales</td>
<td>Gardening</td>
</tr>
<tr>
<td>Hunting/gathering including fishing</td>
<td>Vending</td>
</tr>
<tr>
<td>Artisan/basket making/pottery</td>
<td>Salary/wages</td>
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<tr>
<td>Labour</td>
<td>Remittance</td>
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<tr>
<td>Food outlets</td>
<td>Grocery stores</td>
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</table>

Other, specify…………………………………………………………………………………

**SECTION B: CLIMATE CHANGE KNOWLEDGE**

7a) Have you ever heard about climate change?

YES [ ] NO [ ]

b) Basing on your understanding what does climate change mean?

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

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

c) What are the causes of climate change?

Natural [ ] Man made [ ] Spiritual [ ]

Other (specify)……………………

8 What is the evidence or indicators which show that climate is changing in your area?

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

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

...........................................................................................................................................
9. What are the climate change impacts on women livelihood options?

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

10. How does climate change affect your

a) Household food security.................................................................

b) Local food security.................................................................

c) Water security.................................................................

d) Agriculture (Fishing and gardening) .................................................................

e) Power and energy.................................................................

SECTION C: ADAPTATION MEASURES

11. What adaptation measures have you employed in your area to reduce climate change effects?

<table>
<thead>
<tr>
<th>Off farm activities</th>
<th>Conservation agriculture</th>
<th>Irrigation</th>
<th>Crop diversification</th>
<th>Early and late planting</th>
<th>Gardening</th>
<th>Growing of short season varieties</th>
<th>Growing of drought resistant crops</th>
<th>Conservation agriculture</th>
<th>Migration to cities</th>
<th>Others</th>
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12. As women what challenges are you facing in your area in trying to cope with climate change effects?
Lack of access to financial resources
Poverty
Lack of ownership and control over resources
Gender roles
Lack of power and freedom of actions
Lack of education
Lack of access on decision makings
Culture and religion

13a) What awareness or educational programmes on adaptation to climate change do you participate in at local level?

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

b) In your own perspective, explain their effectiveness if they do exist

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

14.What do you think can be done to improve the status of women in relation to climate change issues?

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

THANK YOU SO MUCH FOR YOUR CO-OPERATION
APPENDIX 2 Interview guide

Interview guide for all key informants

Project title: A study on the effects of climate change on women livelihoods Ward 34, Mt Darwin District, Zimbabwe

My name is Dzungu Lindsay Tafadzwa. I am a student currently studying Bachelor of Science Honours in Disaster Management Studies at Bindura University of Science Education. This interview guide has been designed to collect information from representatives in the study area. You are requested to provide the following information to the best of your knowledge. The information will be treated with strict confidentiality.

Interview date………………. (Interviews done after the consent by the respondents)

1. Where does most families’ main income come from?
2. What do you think are the effects of climate change on women livelihoods?
3. Why are women more vulnerable to climate change?
4. How is climate change affecting household food, water and financial security?
5. What have you done as NGOs in response to changes in their productivity or output?
6. How sustainable are those adaptation strategies in responding to the adverse impacts brought by climate change?
7. In your own opinion what do you think must be done to improve the adaptation of women to climate change in ward 34?
8. How best do you think women livelihood can be improved in the face of climate change?
APPENDIX 3 Focus Group Discussion Guide

Focus group discussion guide

My name is Dzungu Lindsay Tafadzwa. I am a student currently studying Bachelor of Science Honours in Disaster Management Studies at Bindura University of Science Education. This interview guide has been designed to collect information from representatives in the study area. You are requested to provide the following information to the best of your knowledge. The information will be treated with strict confidentiality.

FGD date…………………………. (FDG done after the consent by the respondents)

1. What significant changes in weather variables have you noted over the past 10 years? (for example heat spells, temperature, rainfall amount, duration and distribution, sunshine etc.)

2. How has the change been like? (i) For temperature (ii) For rainfall (iii) Other weather variables

3. Are there any change(s) in the agricultural production output (crop yields/livestock production) for women in the community?

4. What aspect is responsible for these changes? (i) Pest/diseases (ii) Extreme weather/climate change events (floods, droughts, heat spell etc.) (iii) soil infertility issues

6. What are the effects of climate change on livelihood assets:

   a) Human capital

      access to labour, effects on health, work load

   b) Natural capital

      effects on water resources, forests and wildlife, agriculture land

   c) Physical capital

      effects on buildings (storage facilities), electricity, water supply, public goods (schools, clinics, roads, community centres.)