FACULTY OF HUMANITIES

DEPARTMENT OF DEVELOPMENT STUDIES

CLIMATE CHANGE ADAPTATION STRATEGIES AND THEIR CHALLENGES IN LESOTHO: THE CASE OF MAKAUNG COMMUNITY IN MAFETENG DISTRICT.

BY

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DECLARATION

I, **PULANE DOROTHY MOSHESHA**, student number **200501761**, declare that this dissertation has been successfully completed for the Department of Development Studies and Faculty of Humanities at the National University of Lesotho's Master of Arts in the Development Studies Programme. This dissertation is entirely original work that I did on my own initiative and has never before been submitted for credit at another school or faculty.

PULANE DOROTHY MOSHESHA ……...

DATE ……..

DEDICATION

This research is dedicated to my son **Leseli Reabetsoe Moshesha** for countenancing me to further my studies while he stays with my parents the entire period of my study, my mother '**Malebona Alice Moshesha** and my sister **'Malintle Moliahane Moshesha Rants'ele** for their unconditional support throughout my academic journey.

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ABSTRACT

While most studies focus on climate adaptation strategies, very little research exists on why most strategies do not succeed hence the topic; climate change adaptation strategies and their challenges in Lesotho: the case of Makaung community in Mafeteng district**.** The qualitative research study is guided by the Action Theory and designed as a case study with the main goal to explore why the residents in Makaung still struggle to get used to climate change yet there were different adaptation strategies introduced in that area. The objectives of the study were; (a) to examine the causes of climate change in Lesotho, (b) to assess how climate change has affected the daily practices, (c) to investigate what strategies has Lesotho applied so far, (d) to explore the challenges to adaptation and (e) to evaluate the legal framework that support climate change adaptation…Only fifty (50) residents from the selected six villages through purposive and quota sampling were interviewed. Through observation and credibility, it was revealed that Makaung is a very dry area with no infrastructure at all which affects the implementation of different climate change adaptation strategies introduced in the area. However, all strategies significantly differed from those that were introduced in the past years. The findings show that mitigation projects were introduced by the Lesotho government in collaboration with development partners (IACOV, WFP, WAMPP and ReNOKA) as a means to prevent soil erosion by building walls across the inside of dongas and planting trees and grass in the veld but were destroyed by livestock and heavy rainfalls and extreme draughts. The residents were also taught about climate change adaptation through public gatherings and trainings, introduced key-hole gardening, food-for-work (*fato-fato*) and short cycled livestock but few residents applied those strategies. Most of them complained about absence of water in the area for irrigation and livestock as they already struggle with drinking water. There is also lack of law enforcement to protect the projects. The recommendation is that the government should formulate clear policies that guide the projects and enforce law on people who destroy implemented projects. Before introducing the project, project managers have to learn more about the geographical features and the culture of people in the area before implementation.

Keywords: Climate Change, adaptation strategies, challenges, Makaung.

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LIST OF ACRONYMS

AMCEN – African Ministerial Conference on Environment

ANPA – Africa's Network of Protected Areas

AP – African Parks

AUPCC – Africa's Unified Position on Climate Change

BCP – Basotho Congress Party

CC – Climate Change

CCA – Climate Change Adaptation

CEBA – Community and Ecosystem-Based Adaptation

COP – Conference of the Parties

CSD – Commission for Sustainable Development

DFID – Department for International Development

EUC – European Union Commission

GDP – Gross Domestic Product

IACOV – Improving Adaptive Capacity of Vulnerable and Food Insecure Populations in Lesotho

IWRM – The Integrated Water Resource Management

LHWP – Lesotho Highlands Water Project

MDG – Millennium Development Goals

NCCAS – National Climate Change Adaptation Strategy

NCND – National Communication and Nationally Determined Contribution

NGOs – Non Governmental Organizations

RCP – Regional Climate Program

ReNOKA – Takes its name from the local Sesotho language and means “we are a river”

SADC – Southern African Development Community

SDG – Sustainable Development Goals

SES – Social Ecological System

UN – United Nations

UNFC – United National Framework Convention

UNFCC – United Nations Framework Convention on Climate Change

USA – United States of America

USAID – United States Agency for International Development

WAMPP – Wool and Mohair Promotion Project

WFP – World Food Programme

CHAPTER ONE

THE PROBLEM AND ITS SETTING

1.1 Introduction

Climate change has been a global challenge for a long time and Lesotho has been introducing different strategies to climate change adaptation but it seems all efforts were in vain (HelpLesotho, 2022). The climate change adaptation strategies are discussed, providing a framework for the objectives of this project. The chapter provides the study's backdrop, problem statement, research purpose, research questions, and significance of the study, research assumptions, study delimitation, and description of key words.

1.2 Background to the study

Lesotho's scenery and location and climate, described with mountainous characteristics. As a result, the not so stable climate leads to the country's vulnerability and long-lasting climate change (Maro, 2011). Lesotho is already faced with harsh impacts and conditions of climate change that include among other; droughts, removal of soil particles and land degradation that cause desertification and low soil fertility (UNDP, 2012).

Generally, in the future, the country is said to experience even more hot and dry climate conditions. In a similar vein, extreme weather, such as droughts, floods and other dangers related to the climate are still experienced by Lesotho. It also continues to experience fluctuating rainfall and rising temperatures. Removal of soil particles from this point to another, cutting down of forests and or trees, recurrent droughts, land turning into desert, land degradation, and the loss of species living on earth, including wildlife are among others some of the negative effects on the environment. Health, tourism, agriculture and livestock, water resources and other crucial industries are becoming more at risk (Mathatisi, 2022).

In 2013 and 2017, Lesotho issued its second National Communication and Nationally Determined Contribution (NCNDC), respectively (UN, 2020). NCNDC frames the government's endeavours in understanding of improvement objectives and increment, as well as versatile ability to environmental change. In light of the threats that are brought by climate change now and tomorrow, Lesotho is focusing on putting into effect adaptation mechanisms to enhance and diversify livelihoods. In the same manner as on health, human dwellings and the energy sector, variability and change have a particular negative impact on food security and water, making the nation particularly vulnerable (UN, 2022).

Climate change strategies are incorporated into the nation's development strategies as an effort to eradicate poverty and inequality (UN, 2020). The NCNDC for Lesotho is steady on the long-term objectives on sustainable development, medium term objectives of achieving economic development, and reducing poverty. The health sectors, sustainable land management, the environmental sustainability, agriculture and water resources are key areas of focus. The country has four distinct seasons, each with significant temperature swings and highly variable precipitation. The country is influenced by both the Indian Ocean and the Atlantic Ocean due to its location, which results in significant temperature variations (UN, 2022).

Makaung is a rural area in the southern region of Mafeteng district which consists of fifteen villages and this is the area with no infrastructure at all. This region struggles mostly with water access both for household use and irrigation purposes. It has been severely affected by climate change over the past years which resulted in soil erosion from floods, strong winds and draught and currently the area has many dongas, less soil for plantations, very dry and extremely hot because Mafeteng is the hottest district in the country.

Over the past years, the government introduced different strategies to address the climate change. Firstly, the government donated boreholes for water supply but they ended up not operating because of the dryness of the area. The residents were then forced to draw water from the wells and rivers which are not safe for household. The community members failed to adapt to this way of drawing water because the boreholes were very few and most people were still drawing water from wells and they were not trained on how to maintain those boreholes.

In the past years, the government introduced a strategy(project) for prevention of soil erosion. Residents were advised to build thick walls across the inside of dongas and plant trees in those dongas so as to restore eroded soil and to reduce the pressure of water flow during heavy rainfalls. This strategy is called *fato-fato*. This strategy did not succeed because the herd boys fed those trees to their livestock and the walls in those dongas were also destroyed. This was because chief also did not formulate and enforce laws to protect that project so it became difficult for the community to adapt to that government strategy.

During the COVID-19 outbreak in 2020, the same community was supplied with equipment (trees seedlings, spades and watering cans) by the government introducing *fato-fato* again and the residents who participated in the project were also given monthly stipends. This strategy also did not succeed because the restricted movement of people in 2020 and there was no water

for irrigation. To this day there are no laws that rule against people who destroy those plantations.

This shows that community members failed to adapt to those strategies to address climate change in that area and the researcher would like to find out why adaptation to climate change is still a challenge yet there are strategies introduced to address the problem.

1.3 Statement of the Problem

In recent years, because of climate change, Lesotho has been affected by heavy rain falls, severe draught, and extreme weather and these affected the sustainable development of the country as a whole. Different strategies were introduced by the government to mitigate the issue of climate change in Makaung but residents struggled to adapt to those changes in their area resulting in the failure of those strategies. The researcher would like to investigate why all strategies failed and why residents find it hard to adapt to those strategies.

1.4 Statement of Purpose

The extent to which Lesotho has adapted to climate change and the challenges of climate change adaptation in the country is the main focus of this study.

1.5 Objectives

Specific objectives for this study are as follows:

- To examine the causes of climate change in Lesotho;
- to assess how climate change has affected the daily practices of the country as a whole;
- to investigate what strategies has Lesotho applied so far to adapt to climate change;
- to explore the challenges to climate change adaptation in Lesotho; and
- to evaluate the legal framework that support climate change strategies in Lesotho.

1.6 Research Questions

Corresponding Research Questions are as follows:

- What are the main causes of climate change in Lesotho?
- How has climate change affected the daily practices of the residents in Lesotho?

- What strategies has Lesotho applied so far as a means to adapt to climate change in Lesotho?
- What challenges have been faced by Lesotho in climate change adaptation?
- How useful is the legal framework in ensuring climate change adaptation in Lesotho?

1.7 Statement of Assumption

Climate change strategies failed because the country does not have law enforcement measures to support them.

1.8 Significance of the Study

The study will be conducted in order to help in policy formulation or policy amendments. Lesotho is a very small country with the highest rate of corruption and this shows that there is no legal enforcement for policy implementation. This country still struggles with climate change yet there are formulated policies to address the problem and the researcher will help in policy formulation or policy amendments in order to address the problem.

This study will contribute to the limited literature about climate change in the country. There has not been much published about climate change in Lesotho and it becomes difficult for researchers to collect secondary data from articles or journals. So after this research is completed, the research report will help other scholars as a reference for their studies.

1.9 Delimitations of the Study

The research will take place in Makaung (Mafeteng) and from the Lesotho government Ministries concerned with climate change. Climate change and adaptation strategies in the country is the extent to which they have been applied and how they have been implemented and this will be the researcher's focal point.

1.10 Definition of Key Terms

Climate change: It refers to long term shifts in temperatures and weather patterns; such shifts can be natural, due to changes in the sun's activity or large volcanic eruptions (UN, 2023). On the other hand, National Oceanic and atmospheric Administration defines it as patterns of temperature and weather over long periods of time (NOAA, 2023). The researcher will use the first definition for her study because it aligns with the objectives.

Strategy: Filho (2018) defines it as a long-term plan for achieving something while (MSG, 2022) defines it as an action that managers take to attain one or more of the organization's goals. For this study the first definition will be applied to describe strategy.

Adaptation: a change in form, function, or behaviour through which a species or person enhances its chances of survival in a certain environment (Filho, 2017). It can also be defined as the stage play that has been adapted from the written book. From the two definitions, the researcher will use the first definition for this study.

Challenge: to test ability or strength of something or to invite someone to engage in a contest. The best definition for this term in this study is the first one and it will be applied throughout the study.

1.11 Summary

This chapter discusses climate change and its negative effects in Lesotho and how the country still struggles to adapt to the fluctuating climate regardless of different strategies applied by the Lesotho government. It also shows that the researcher will investigate in depth based on the given research objectives and questions why people still struggle to accept the long-term weather changes and temperatures. Finally, it shows how the study will contribute to policy formulation and limited literature after the study is completed. To contextualize the study, next chapter discusses related literature.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

There are many scholars around the globe who have written about climate change adaptation but only a few of them have written about climate change adaptation in Lesotho (source). The literature in this country is mostly from the government articles or non-governmental organizations reports. The theory supporting the study (theoretical frame-work), conceptual discussion and empirical evidence will be discussed.

2.2 Theoretical Framework

This study is guided by the Action Theory of Adaptation. Adaptations are (Alves, 2002) changes made by human systems developments within individuals and systems. This study specifically talks about human beings as individuals and collective actors in our strategy. The following is an overview of the Action Theory, which may be partially constructed on existing principles like the requirement for actors and the objective for action. The goal focuses on the effects.

Furthermore, adjustments necessitate the use of assets in order to achieve the anticipated closures. Action theory refers to a method of adaptation that takes into account different players performing varied roles and underlines the interconnectedness of complex activities dealing with the socioeconomic impacts of climate change. It is very crucial when analyzing to define and explain the function of adaptations and to take into account the possibility that adaptation operators and receptors are distinct from exposure units (Dolsak, 2018).

The simple terminology made it easier to discuss complicated types of adaptation (Bours, 2014). By combining theory's key principles in various ways and using it as a basic unit of analysis to map actor groups, critical adaption barriers may be gathered.

Identifying the foundations of those boundaries in terms of the means-end chains among administrators and receptors of transformation, the organization of actors who take on various roles, furthermore accidental receptors, and the assets that are available to them, gives hints about the administration systems that may help overcome such impediments.

According to the notion, adaptations are single or group activities that are overtly or tacitly designed to impact exposure units to climate change, or that achieve this goal indirectly. this

also is the only viable definition utilizing the concepts offered by the action theory of adaptation (Vogel, 2012).

The idea does not address the issue of what constitutes an adaptation. It is useful to include just direct or reflexive adaptation, for example, in research design or practical problems. It is claimed that the theory is especially beneficial for making clear claims about what adaptations are taken into account in a given situation.

In order to operationalize adaptation assessments, the system governance is essential for terminological reasons as well. For comprehension of how adaptation is governed, the theory provides explicit claims regarding important variables. The action theory of adaptation's method is quite analytical, which presents a challenge.

Parson's (1937) action frame of reference is intended to be used to investigate a unit act. This takes into account the concept of a "atomistic" action unit into which all other, more complex actions can be separated. It is possible that "simple" adaptations are components of more "comprehensive" adaptations. Indeed, from this perspective, a comprehensive examination of individual adaptations is likely to reveal a huge collection of adaptations that are linked in a way that resembles a "molecule." According to the literature on policy classification, classification approaches are considered to be dependent on the frame of reference, and comparable concerns are difficult to demonstrate (Filho, 2017).

However, the action theory has additional exciting applications. As previously stated, the terms operator, receptor, and exposure unit can be utilized to map complex actor networks. According to Anderson (2005), this is used to calculate the transaction costs associated with the coordination of numerous actors in the creation and execution of adaptation strategies, or it could serve as the foundation for understanding adaptation conflicts amongst several participants. The theory can be used to organize and classify adaption collections. There is also the possibility of promising extensions.

The norms and values that influence social action are given a major place in Parson's action theory. The adaptation action theory does not currently address this, but it may be supplemented with a look at the available tools and conditions to improve the analysis of the institutional components of adaptation. Finally, given the importance of uncertainty and time in adaptation, it is advised that future research explicitly consider how stimuli and means unfold through time, as well as actors' perceptions and beliefs.

2.3 Climate Change

Shafar (2017) defines climate change as the long-term changes in the world climate. The creation that includes forests, snow, rain, oceans, earth and many more, work together to create the global climate. Prior to the threat posed by climate change, most nations continued to operate in an archaic manner until the introduction of the industrial revolution in 1765. Construction and the provision of public services like power, gas and water are included in the broad definition of industrialization, which excludes manufacturing (Filho, 2021)

Representatives from seventy countries attended, with the primary purpose of focusing on the future of the planet in terms of the ecology and socioeconomic development. They also developed a wide agenda and a new blueprint for international action on environmental and development challenges, which will help drive international cooperation and development strategy in the twenty-first century. The Commission for Sustainable Development (CSD) was established in 1994 as a result of the "Earth Summit." It was determined that everyone in the globe could achieve sustainable development, regardless of where they lived—locally, nationally, regionally, or internationally. The Commission for Sustainable Development was established in 1994 as a result of the 'Earth Summit' (Klein, 2017).

The entire community is feverishly looking for ways to lessen severity effects of climate change. Elites from around the world are negotiating vehemently in an effort to find answers that will rescue both humanity and the environment on who should pay for this and how to justly transition to a net-zero global economy are ongoing topics of dispute. These discussions are crucial, and the issue of the disappearance of nature is being resolved. However, the issue that is being overlooked and needs to be the focus of all efforts to stop the globe from warming should be addressed.

The planet's natural systems regulate climate and lessen the effect of major climate events. However, biodiversity must be intact and completely functional for nature to be adequately successful. In the Congo rainforest, for example, if the forest is to effectively support climate through the carbon cycle, strong populations of forest elephants, which scatter seeds and shape the forest undergrowth, and insects, which are crucial to pollination, are both required (Filho, 2017). The remaining natural systems must be secured and protect the remaining natural systems in addition to drastically decreasing greenhouse gas emissions if global warming was

to be limited to minimal. These are the most direct and powerful climate acts that needs to be taken.

Today with an estimated eight billion people on the earth, more people are affected by extreme weather than they were nighty years ago, when there were only two billion. The consumption of natural resources has increased fourfold in this time period. As a result, nature's productivity and capacity to control the climate have decreased, and so has the ability of people to withstand extreme weather (Becken, 2010). For instance, Malawi experienced exceptionally heavy rains in 2022. Previously, agriculture and the production of charcoal have obliterated naturally occurring Mimbo woodland, which possesses protective and soil-binding properties. This made the effects of the abnormally heavy rains much worse and caused devastating floods that uprooted over one hundred and fifty thousand (150 000).

Despite having the lowest per capita greenhouse gas emissions in the world, Africa is continent that is mostly affected by the consequences of climate change. Extreme weather disasters like droughts and floods frequently render Africa's poorest citizens defenseless, and the resultant malnutrition and livelihood insecurity are frequently disastrous. If there is ever going to be a way to lessen these calamities, it is important to look at the mechanism that controls them, which is nature.

Malawi's floods had terrible effects on people, they would have had even worse effects if some of the country's existing protected areas had not been well managed and repaired. Because of the global nature of the climate catastrophe, what occurs in Africa affects the rest of the globe. Therefore, it is crucial that the global community help to reduce the strain on the continent. However, with this assistance, Africa's people are in a better position to comprehend their problems and solutions required to solve them. Only when people who will be most impacted are involved in designing the answers will there be valuable investments made into practical solutions (Conway, 2021).

Global leaders have endorsed the Leaders 'Pledge for Nature, and the G7 nations have expressed their intention to create a world that values nature, demonstrating the growing urgency to safeguard biodiversity (Dolsak, 2018). However, the majority of conservation efforts still remain at the level of platitudes.

There is still an excessive focus on land restoration, which involves mending nature after it has been destroyed rather than preventing it from being destroyed, despite the fact that we are

starting to recognize the seriousness of these challenges. It is expected that an active intervention like forest restoration will be expensive and labor-intensive. On the other hand, African Parks currently believe that managing protected areas across a range of diverse habitats will be quite expensive. Not only is biodiversity preservation more economical than restoration, but it can also take decades, if not longer to get nature back to the point where it can provide all the essential ecosystem services (Field, 2000). The luxury of time simply is not available to humanity.

There are over 8000 protected areas in Africa, but the bulk of them are either too small or in poor enough condition to fully conserve internationally significant ecosystem services and ensure ecological resilience to climate change. African Parks (AP) examined Africa's Network of Protected Areas (ANPA) in 2020, and one hundred sixty-one hundred (161) protected areas were identified as "anchor areas" that harbor significant biodiversity, sequester carbon, deliver clean air and water, and provide food security for people, taking into account the size of the areas, the intactness of the habitat, and the strength of their legislation (Becken, 2010).

Despite making up a small proportion of total protected areas, Africa's one hundred and sixty-one (161) anchor areas cover more than a quarter of the continent's protected surface area. In addition, they are responsible for eighty-five percent (85%) of Africa's ecoregions and biodiversity (Mckibbin, 2002). By providing stable ecosystems and vital ecosystem services to communities, these places can serve as the foundation for larger-scale conservation and restoration activities. This comprehensive strategy focusing on these "anchor areas" might serve as the framework for Africa's strategy by reserving up to fifteen percent (15%) of the continent for nature and building climate resilience in some of the world's most vulnerable people.

Only forty percent (40%) of the one hundred and sixteen (116) protected areas were found to be sufficiently long-term sustainability that requires enough resources and management in the African Parks analysis. To address the challenges to biodiversity that the surviving areas still experience, such as habitat degradation and species extinction, immediate action is needed, a task that can be completed with the support of regional authorities, local communities, and international partners (Becken, 2010). Private sector, Governments, management organizations local communities and, donor organizations all share responsibility for successful biodiversity management and financial assistance. Accountability for results on the ground must be clear and collaborative in order for this common duty to be fulfilled.

The world’s natural resources have been depleted as a global community, significantly reducing their capacity to sustain life on Earth. Because of the escalation of people’s problems, solutions must also be escalated even though achieving a stable and predictable climate is unlikely in the near future, the root cause of the problem must also be addressed (Conway, 2021), which is inadequate protection of the planet's natural systems, while promoting socioeconomic stability to provide the world's most vulnerable populations with the resilience they need to survive this critical period in the planet's history. Despite the fact that the entire world is dealing with climate change, mostly vulnerable is Southern Africa region (Bours, 2014).

Warmer-than-average land and ocean surface temperatures were expected in the Southern African Development Community (SADC) region in the following year, which affected the timing and severity of metrological events, as well as rainfall and winds. Climate change threatened SADC's regional economic development goals in a variety of ways. Increased floods, cyclones, and draughts may inflict infrastructure damage, disrupt livelihoods, ruin agricultural crops, and kill people. South African progress is dependent on a number of circumstances, including SADC's adherence to a number of international climate change treaties and programs (Conway, 2021).

International accords and regional initiatives oversee climate change adaptation and mitigation. The following conventions have been ratified by all SADC member countries: (a) the United Nations Framework Convention on climate change, which supports fewer emissions to cool the earth and provides suggestions for dealing with its consequences. (b) The Ramsar Convention on Wetlands, which places a specific emphasis on the preservation of globally significant wetlands and has a goal addressing the impacts, adaptation, and mitigation of climate change; (c) The Kyoto Protocol, which lays out a plan for lowering greenhouse gas emissions (Filho, 2017).

Furthermore, adaptation to climate change is one of six (6) key areas of collaboration outlined in a Memorandum of understanding between SADC and the World Food Programme (WFP). The African Ministerial Conference on the Environment (AMCEN) which was established in December 1985, and the regional Climate Change Programme (CCP) which was a five-year (2013-2018) funded by United States Agency for International Development (USAID) have also devised a framework for sub-regional climate change adaptation initiatives (WorldBank, 2021).

Water resources are notably impacted by climate change, despite the fact that many industries are still affected. With the continuous arrival of climate change, access to water is expected to become more difficult in parts of the SADC region where conditions are already unstable. Since that time, the SADC Secretariat has been enhancing the Climate Change Adaptation (CCA) strategy for the water sector (Noris, 2020).

The strategy's primary purpose was to manage and produce adaptive water resources for mitigating climate change effects in the Southern African region. Water management practices must be resilient to increased climate variability in order to lessen climate vulnerability, SADC plans to accomplish this goal by developing all sectors of the water sector.

In response to the regional implications of climate change, the SADC region established a Regional Climate Programme (RCP) which is now in the planning stages. The study from the Southern African Sub-Regional Framework of Climate Change Program served as the program's development guide (Conway, 2021). The study evaluated the short-term measures being made to combat climate change. Following the African Ministers' Conference on Environment's decision to mandate the AMCEN report, the AMCEN Secretariat assisted in its creation and contributed to the African Framework of Sub-Regional Climate Change Programs. Water shortages are said to have an influence on a number of industries, including agriculture, energy, and health, according to the climate change adaptation strategy.

Similar steps are required for governance management and supervision. The Integrated Water Resource Management (IWRM) approach offers a goal-oriented framework for tracking water usage, which is critical for the region's water use in order to mitigate the consequences of climate change. The South African Sub-Regional Framework of Climate Change Programmes Report served as a reference for the development of this program, which was then reviewed. The African Ministerial Conference on Environment's decision to require that AMCEN report also adds to AMCEN's reaction to climate change, which was implemented at the regional level by demanding the development of a regional climate program. (Chersich, 2019).

Furthermore, the Norwegian government is funding a tripartite climate change program through the Norwegian Ministry of Foreign Affairs, the European Union Commission (EUC), and the UK Department for International Development (DFID) in collaboration with the SADC Secretariat, and the East African Community (EAC). The program seeks to incorporate Africa's Unified Position on Climate Change (AUPCC) into the United Nations Framework Convention

on Climate Change agreement in order to unlock funds for supporting strategic interventions that improve productivity and livelihoods for millions of climate-vulnerable people in the region.

The program aims to incorporate Africa's Unified Position on Climate Change (UPCC) into the global agreement of the United Nations Framework Convention on Climate Change (UNFCC) in order to free up funds for supporting strategic interventions that sustain productivity and livelihood improvements for millions of climate-vulnerable people in the region (Chersich, 2019).

2.4 Global Warming and Climate Change

The long-term warming of the Earth's surface observed since the pre-industrial era (between 1850 and 1900) is the result of human activity, specifically the usage of fossil fuels, which increases the amount of greenhouse gases that trap heat in the atmosphere (Twain, 2020). According to estimates, human activities have led to a one-degree Celsius increase in the global average temperature from the pre-industrial era. Temperatures are rising at a rate of more than 0.2 degrees Celsius per decade. Human activity has clearly produced the current warming trend, which has progressed at an astounding rate over time since the 1950s. (Environmental Defense Fund, 2019).

Human activities, particularly the use of fossil fuels, which increases the concentrations of heat-trapping greenhouse gases in the Earth's atmosphere and thus raises the planet's average surface temperature, are to blame for the climate changes that have been observed since the mid-twentieth century. To track and assess the past, present, and future implications of climate change, it is necessary to understand how natural processes that have been supplanted by human activity, such as internal variability (such as cyclical ocean patterns), might contribute to climate change (Becken, 2010).

Historical climate data records provide evidence for several key indicators of climate change, such as rising sea levels, ice loss at the poles and in mountain glaciers, changes in the frequency and severity of extreme weather events such as hurricanes, heat waves, wildfires, droughts, floods, and precipitation, and changes in cloud and vegetation cover (WorldBank, 2020, Fund 2019).

It is worth noting that although Lesotho suffers so much from climate change, it contributes almost zero percent to global warming as it is a developing country. Lesotho is a very small country with a very small number of firms that emit exotic gases and waste products that pollute the environment. This results in a threatened food security because majority of Basotho depend on agriculture for livelihood.

2.5 Climate Change Adaptation Strategies

An adaptation strategy is a program, project, or methodology developed to deal with the anticipated effects of climate change in a specific area of possible concern (Filho, 2018).

Strategies of adaptation are intended to inform and assist communities in identifying appropriate responses to current and anticipated dangers brought on by climate change. According to the UN (2022), 172 Governments at the historic Rio meeting adopted the Rio Declaration, Agenda 21, and the Statement of Forest Principles, a set of guiding principles for the sustainable management of forests worldwide.

Additionally, at the Summit, two documents that are legally binding were made available for signature: The Summit also enabled the Global Environment Facility and the United Nations Framework Convention on Climate Change to be signed. At the same time, the Convention to Combat Desertification was being negotiated, which opened for signature in October 1994 and went into effect in December 1996.

According to Houghton and Bruce (1995), the breadth and scope of the topics covered during the Rio conference set it apart from prior UN conferences. In Rio de Janeiro, the UN worked with countries to think about economic development and figure out how to halt the exploitation of priceless natural resources and environmental harm. A strategy was presented in 1997 during the Special Environment Session of the General Assembly, sometimes known as "Earth Summit 5", which evaluated the implementation of Agenda 21 (McKibbin 2002).

The eight Millennium Development Goals (MDGs) were set during the Millennium Summit in 2002. High-level meetings in New York in 2005, 2008, and 2010 evaluated the Millennium Development Goals, and a new Action Plan was formed during the World Summit on Sustainable Development in Johannesburg in 2002 (UN, 2015). Next in 2012 in Rio was the United Nations Conference on Sustainable Development, also known as Rio+20. As a result of

this event, the United Nations Environment Assembly was established, becoming the principal environmental decision-making organization in the world.

The environment assembly convenes to define international environmental law and to determine objectives for global environmental policies (UN,2014). Two years before the Millennium Development Goals were to be completed, a special meeting was held in New York in 2013. At this conference, member countries agreed to hold a high-level summit in September 2015 to create a new set of goals to complement the existing ones. In 2005, 2008, and 2010, high-level evaluations of the Millennium Development Goals were held in New York. As a result, the 2012 United Nations Conference on Sustainable Development took place in Rio de Janeiro.

The environment has been incorporated in the framework of sustainable development since the famous Stockholm Conference on the Human Environment in 1972 (UN, 2014). Each of the United Nations' Sustainable Development Goals (SDGs) takes the environment into account (UN, 2015). The Sustainable Development Goals (SDGs) 6 (Clean Water and Sanitation), 7 (Affordable and Clean Energy), 11 (Sustainable Cities and Communities), 12 (Responsible Consumption and Production), 13 (Climate Action), 14 (Life Below Water), and 15 (Life on Land) are all inextricably linked (UN, 2015).

The UN system is collaborating with partners to advance climate action, help nations to stop global warming, and to achieve the objectives of the Paris Agreement. In addition to promoting sustainable energy, the UN wants to guarantee jobs, clean water, renewable energy, and food security. Representatives from governments, corporations, and civil society came together for the 2019 Climate Action Summit, which produced a number of ideas to further climate action (UN, 2008).

These coalition-based efforts, which include participants from the public and private sectors, are moving forward and producing results (Popovski, 2020). On December 12, 2015, during the Paris Climate Conference (COP21), parties to the United Framework Convention on Climate Change (UNFCCC) struck a historic agreement to combat climate change and accelerate and intensify the actions and investments essential for a sustainable low-carbon future. The major goal of the Paris Agreement is to enhance the global response to the threat of climate change by limiting global temperature rise this century. The Paris Agreement aspires

to enhance the international response to the issue of climate change by slowing the rate of global temperature rise this century (Klein, 2017) (Popovski, 2020).

With regard to Africa, it has long been said that this continent is plagued within issues particularly issues with adaptation to climate change. There is no getting around the fact that the continent is dealing some difficulties. The continent of Africa, on the other hand, seems to have a wealth of natural resources that could be used to mitigate the effects of climate change.

Some studies even contend that Africa can provide solutions to the world's worst environmental crisis and it undoubtedly contains the least overall emissions of greenhouse gases per capita worldwide accounting for roughly seven percent (7%) of the total emissions worldwide. However, some experts bring out a contradiction that merits some thought; how it is conceivable; studies even contend that the continent of Africa may hold the key to resolving the world's worst environmental issue (Fitchett, 2022). Some experts however, draw attention to a contradiction that merits thought, specifically how it is possible that up to forty-five percent (45%) of Africans lack access to electricity, despite the continent having the biggest potential for renewable energy sources in the world.

Utilizing the solar energy that the sun has to offer, along with wind, hydro energy, geothermal energy and the recently discovered enormous potential for green hydrogen, might change the game not only for the continent Africa but also for the entire globe. These are all natural resources that, unlike in western nations where industrialization has taken hold, do not release harmful gases into the atmosphere when used since they do not harm the ozone layer.

Africa is also renowned for having the largest reserve of rare surface which is crucial for "green" technologies. Africans look up to the western nations and are unaware of the significance of their resources to climate change adaptation, thus it is clear that Africa is part of the global solution. Ecosystem restoration will definitely offer several solutions to various crises, including draught, poverty, land and biodiversity loss, given the vast land mass and the hundreds of millions of hectors of land that may be returned to health for food production and water conservation. Another option is to give farmers and pastoralists access to energy because this can assist in decreasing food waste which directly benefits land use, desertification control and biodiversity preservation (Filho, 2017) (Yang, 2020)

Africa's demography is dynamic, so it makes sense for the globe to take advantage of this potential now rather than waiting until the continent's population reaches two billion by the

year 2050 and four billion when the century is over (Hassan, 2012). In order to address the issue of climate change, many conferences are organized in Africa, such as the UN Climate Change Conference COP27, where various delegations will discuss the potential solutions in Africa.

Africa Climate Week is another significant event on the calendar for the climate change that explores issues like sustainability and nature-based solutions. It will be held on 4-8 September 2023, Nairobi, Kenya. It is intended to foster regional cooperation and expedite climate action to hasten the implementation of the Paris Agreement. At that Summit, it will be discussed how African nations are all at risk from climate change and how they can all work together to combat it. Government representatives, business executives, development agencies, youth, and members of civil society who are present for the discussions will focus primarily on the implementation of the Paris Agreement (UN, 2023).

To demonstrate even more clearly that steps are being done to address the problem, some of the actual examples of climate change that is already under way will be highlighted. The lack of financial support was one of the biggest obstacles to Africa's ability to adapt to climate change but the G7 countries resolved this issue by pledging to provide one billion dollars in climate commitment annually. The UN climate Change Conference COP27, which was be held in Sharma El Sheikh, Egypt last year (2022), presents a significant opportunity to advance regional action on reducing greenhouse gases, increasing resistance to climate change's consequences, and mobilizing financial support (UN, 2022). This was a positive step for the African continent but it also called for cooperation amongst various nations, as this made it easier to execute the Paris Climate Agreement and the Glasgow Climate Action, there was also a bold action, firm decisions accountability for implementation of regional climate action. The approval of South Africa's National Climate Change Adaptation Strategy (NCCAS) in 2020 strengthens the nation's capacity to fulfill its commitments under the Paris Agreement on Climate Change.

The strategy identifies the country's vulnerabilities, makes strategies to mitigate those vulnerabilities and take advantage of opportunities, lays out the resources needed for such action, and tracks the nation's progress in adapting to climate change (Conway, 2021). The 2015 Paris Agreement raised the importance of climate change adaptation by establishing a global focus on enhancing adaptive capacity, creating resilience, and reducing susceptibility to climate change. The international community, including South Africa, missed the chance to

demonstrate more ambition on adaptation, mitigation, and the financing necessary to confront climate change during the 2019 international climate conference in Spain (Chersich, 2019).

This is to make sure that adaptation and mitigation are balanced, and that African countries are given enough financial, technological and skill support to strengthen their efforts to combat climate change.

With all the provided strategies, Lesotho does not benefit much from the strategies because of its geographical features. It is mountainous and rocky with less land to plant trees or anything and it the coldest country in Africa; as a developing country with poor infrastructure, it does not have enough resources to implement most strategies or even teach people about climate change effectively. COVID -19 pandemic also worsened the matter because people were restricted from free movement and climate change is closely related to the environment, people were unable to look after the ecosystem and it was hugely damaged.

Lesotho is actively battling the consequences of climate change by rehabilitating its land and equipping its people to remain resilient. The country, which suffers from severe land degradation and food insecurity, has been implementing long-term food production and land rehabilitation projects that not only benefit the country's natural resources, such as water and grass, but also ensure that communities can grow their own food for consumption and commercial purposes despite extreme weather conditions (WorldBank, 2020).

The actions are in response to a request from the heads of state and government present at the United Nations Convention to combat desertification. The international community should act rapidly to stop the deaths and loss of livelihoods that communities throughout the world are experiencing as a result of the deteriorating effects of draught, land degradation, and desertification, according to the 15th session of the COP. Lesotho is one of the countries suffering from the most severe effects of climate change, such as soil degradation, drought, and excessive rains, but it is also one of the most committed to and successful in restoring its land and empowering its people (UNDP, 2020).

Because some animals are dying as a result of damaged soils, the country is in such financial distress that its residents are obliged to sell their livestock. They are also working with the government to develop a strategy to combat these consequences. Climate change is predicted to have a considerable influence on food production, agricultural livelihoods, and food security in Lesotho. Future water supply constraints and temperature rises are projected to affect agricultural production and food security for farmers that raise livestock for food security rather than profit (UNDP, 2012).

The northern region of Lesotho normally has rainy season between September and May and this has a positive impact on beans, wheat, sorghum and wheat yields. However heavy temperatures and heavy humidity probably lead to further fungus outbreaks and counteract strong growth patterns brought on by combination of high warmth and rainfall. Since climate change, the development winter crops like wheat are severely affected because it comes too cold than it used to be in the past. Crop yields and production are anticipated to be more negatively impacted in Lesotho's southern regions because it's too dry (UNDP, 2020).

Lower yields are expected to occur from reduced water availability, and decreased soil moisture may alter the regions that are appropriate. Soil erosion and land degradation continues to get worse as droughts and extended dry spells have become common. As with agricultural pests, rising temperatures could affect their distribution and raise the likelihood of wild fires, temperature thresholds are crucial for agriculture and livestock because severe heat, in particular, can harm plants and have a negative impact on livestock and farm workers' health (Environment, 2022).

Moreover, early growth can be hampered by cold and frost, while high temperatures that exceed the criteria for a given crop drastically reduce yield. There are different strategies for climate change adaptation namely; crop rotation, relay cropping and intercropping techniques along with the application of manure and plant as to preserve soil moisture and to restore fertility. Putting in place methods for climate-smart agriculture, better water management, enhanced monitoring, and crop types. In order to address the dangers to the agricultural industry, supporting technology such as irrigation systems and shade nets is also deployed as an adaptation technique. In order to increase income generation, further initiatives include the creation of water collection methods, practicing crop rotation on plants that are drought resistant like sorghum in the northern region and the allocation of land and production to high-value crops (FAO, 2020).

Lesotho as one of the major water catchment sources in Southern Africa is recognized for its relatively ample water resources and receives around fifty percent (50%) of the total catchment surplus. Water is one of Lesotho's most valuable renewable and sustainable natural resources due to the country's nature and closeness on important demand areas in Southern Africa. The country's environmental integrity and socio economic growth are both supported and by this water resource (GOL, 2022).

South Africa's Gauteng Province receives water from the Lesotho Highlands Water Project (LHWP). A significant fresh water source, Lesotho has drainage zones that reach the Atlantic Ocean

through South Africa, Namibia, and Botswana. As a result, it is anticipated that the country's adaptation to climate change would have a large regional impact on both the nation's and the region's fresh water supplies. Although Lesotho is known for its extreme poverty and income disparity, water nevertheless makes about ten percent (10%) of the country's Gross Domestic Product (GDP). An important portion of this benefit and assistance in the growth of hydropower resources in Lesotho are produced by LHWP, a multi-stage infrastructure initiative that makes it possible to transport water from the water-rich highlands of Lesotho to Gauteng, the continent's industrial hub (WorldBank, 2020).

2.6 The Case of Uganda

According to the World Bank (2020), Uganda has made great progress in decreasing poverty and promoting socioeconomic development during the last several decades. In 1992, around fifty-six percent (56%) of the population was poor. By 2016, that proportion had dropped to twenty-one percent (21%), but the worldwide economic repercussions of the COVID-19 epidemic and the effects of climate change are forcing the country to face new challenges: shocks not only threaten continued progress, but also undo hard-won victories in the past.

Acording to the report, almost seventy percent (70%) of Uganda's labor force is employed in agriculture, a very climate sensitive sector. Uganda, for example, is Africa's second largest coffee exporter. This high-value crop accounts for more than seventeen percent (17%) of Uganda's exports. Recent droughts, on the other hand, are thought to have destroyed half of all coffee crops.

Changing climatic conditions are predicted to offer significant challenges to Uganda's coffee sector in the future decades: without adaptation measures, only one percent of Uganda's existing coffee producing area is expected to be able to sustain production. And coffee isn't the only industry that could be hit hard by climate change: almost two and a half million Ugandans are at risk of flooding.

Climate change poses a huge risk to people's lives and livelihoods in places all over the world. These dangers cannot be eliminated, therefore governments must take strong action to assist businesses and individuals in managing them.

2.7 Studies done by other Scholars

These are based on findings done by other scholars and are divided into subsections as determined by the location where the studies were carried out.

2.7.1 International Studies

In a research project titled Climate Change Adaptation and Mitigation in Ecosystems-Benefits, Barriers, and Decision-Making, Lea Ravnkilde Moller (2016) investigated about climate change and adaptation. Denmark was the location of the study. He adopted a mixed method approach as his methodology with the main goal of determining how households depending on ecosystems may profit from climate change adaptation and mitigation.

The following points were given priority by the researcher: (a) Joint Adaptation and Mitigation in Agriculture and Forestry adopts a broad perspective on synergies and trade-offs between adaptation and mitigation of climate change within forestry and agriculture in developing countries and takes into consideration previous experiences described in the literature, which is economic benefits of reducing climate change through empirical welfare, Choosing a coping strategy when rural households depending on agricultural production encounter significant, unanticipated shocks, as in (b) Estimating the Benefits of the Interrelationship Between Climate Change Adaptation and Mitigation - A Case Study of Replanting Mangrove Forests in Cambodia (c) Empirically Based Analysis of Households Coping with Unexpected Shocks in the Central Himalayas) Simulation of decision and reaction patterns in relation to the belief in future climate changes and trajectory of decisions when knowledge about future climate is gradually increased and (d) Simulation of Optimal Decision-Making under the Impacts of Climate Change.

First, there are plenty of chances to combine adaptation and mitigation efforts to combat climate change, particularly from a landscape perspective. The researcher came to the conclusion that more empirical research was necessary to fully understand the complexity of mixing adaptation and mitigation as well as synergy, cost-efficiency, risk, and uncertainty. Joint mitigation and adaptation contain several benefits, particularly from a landscape perspective. The researcher believes that carbon payments and a carbon credit system can be used as incentives to promote further adaptation action in light of such empirical findings.

Second, methods and choices for combating climate change can evolve through time. The ability to choose and take action for individuals who are affected by climate change is a key

component of this. The size is quite unclear, which makes it harder to make decisions about what to do and raises doubts about the benefits of adaptation and mitigation of climate change. Given that rural Nepalese households depend on agricultural production, there is a more thorough empirical investigation of actual decision-making.

Thirdly, households who endure severe, unanticipated shocks choose for coping mechanisms that provide them access to funds to deal with the shocks. Demonstrates how decision-making and freedom of action may evolve as our knowledge does.

In order to develop synergy between climate change adaptation and mitigation, it is important to recognize that those who were affected the most severely are often those with the fewest resources. These people therefore do not have the resources to think about long-term strategy and have limited options for managing potential crises. In order to ensure greater freedom of action for the world's poorest people and raise their capacity for adaptation and the ability to make the best decisions for the future, it is crucial to combine development with the battle against climate change. Mitigation should be taken into account when making decisions to enhance global welfare because climate change is a global concern.

The country where this study was conducted had a greater level of life than Lesotho, which is currently under development. The standard of living is a gap in my study because Denmark is among the most developed nations in the world, and what we think of as best in Lesotho might be worse in Denmark due to the difference in living standards in both countries. This means that due to the disparity in infrastructure between the two countries, the same technique cannot produce the same outcomes.

Shaikh (2017) performed another study on climate and adaptation titled Climate change adaptation and recovery from climate hazards: micro econometric evidence from rural Bangladesh.

The two main environmental and resource economics goals of this thesis are the adaptation of agricultural households to climate change and the recovery of agricultural households from climate hazards.

In this project, the researcher sets additional goals, including (a) articulating the perspective of the whole study and the justification for studying Bangladesh. It summarizes the evidence for climate change and disasters around the world, their effects, vulnerabilities in the agricultural

sector, the importance of adaptation, and the impact of disasters on poverty. It also (a) looks at whether crop choice is influenced by climate change and how much households switch their crops in response to climate change scenarios.

The adaptation of agricultural households to climate change and the recovery of agricultural households from climate hazards are the two key environmental and resource economics goals of this thesis.

In this project, the researcher establishes extra objectives, such as (a) expressing the overall study's perspective and the rationale for investigating Bangladesh. It highlights the evidence for climate change and catastrophes worldwide, their effects, agricultural vulnerabilities, the importance of adaptation, and the impact of disasters on poverty. It also (a) investigates whether climate change influences crop choice and how much families switch crops in response to climate change scenarios.

After gathering information, it was discovered that crop selection is climate-sensitive and that crop selection in Bangladesh will change in response to climate change situations. According to the findings of this study, crop selection will be more responsive to temperature variations than to changes in rainfall.

The second concern is how climate change affects agricultural diversification and how households respond to different climate change circumstances. It concludes that crop diversity is climate-sensitive, and that this diversity varies according to climatic conditions in different places. The effects of rainfall scenarios on crop diversification are significantly less important when compared to the effects of temperature.

The third finding is that disasters cause income loss, but people display resilience by accelerating higher income growth in affected areas compared to non-affected areas. Low-income individuals are more vulnerable to asset loss to income production than high-income individuals. Last but not least, asset holding or loss affects the dynamic of poverty groups, and poverty traps prevail at low income levels in disaster-affected areas compared to unaffected areas.

The recommendation is that people need to be taught more about climate change.

Although Lesotho and Bangladesh are both developing countries the same strategy of climate change adaptation may not yield the same results because of the difference in geographical area. Bangladesh is a flat humid country with forests (Kumar, 2019) and it is prone to floods as a climate change which is not a case in Lesotho. Lesotho is a very mountainous cold country with few forests and it is mostly affected by strong winds and extreme droughts as a result of climate change. This shows that even though both countries appear to be both developing countries, the geographical area becomes a gap in this study and the same strategy of climate change adaptation may not produce the same results.

2.7.2 Studies from Africa

Bouba Traore (2014) investigated climate change and adaptation in a research project titled Climate Change, Climate Variability, and Adaptation Options in Sudano-Sahel Cropping Systems in West Africa. The researcher employed a quantitative research strategy.

Sudano-Sahelian zone of West Africa (SSWA) states that agriculture provides jobs to more than sixty percent of the population as it is the main source of the cost of living for rural communities. Again it contributes to a certain percentage of gross domestic product. Most products that are produced from agriculture are maize, sorghum, millet cotton for the market. Because of increasing uncertainty of the weather conditions, farmers' yields suffer. This is due to climate variability, climate change and poor agricultural management.

The goal of this dissertation was to evaluate the real and perceived characteristics of climate variability and change, as well as their effects on crop production, using experimentation, modeling, and participatory approaches in order to identify opportunities for enhancing farmers' adaptive capacity in the Sudano-Sahelian zone. The overall approach was based on first understanding the past trend of climate and its effect on the yield of the main crops cultivated in southern Mali; second, evaluating different adaptation options in the field in collaboration with farmers; third, evaluating climate adaptation options through experimentation on station; and fourth, evaluating the consequences of different adaptation options under different long-term climate change scenarios.

The findings revealed that between 1965 and 2005, the minimum daily air temperature increased by 0.05 degrees Celsius each year on average, whereas the maximum daily air temperature remained constant. Seasonal rainfall showed substantial inter-annual variation with no noticeable trend from 1965 to 2005. However, the total number of dry days throughout the growing season increased considerably, indicating a shift in rainfall distribution. Cotton

yield was negatively impacted by maximum temperature, number of dry days, and total seasonal rainfall. Farmers saw an increase in temperature, a rise in the frequency of dry spells during the rainy season, and a rise in the variability of yearly rainfall.

The most frequently chosen adaptation measures to deal with climate variability were short maturing crop varieties, drought tolerance, and proper planting dates. While the cost of fertilizer prevents millet from being fertilized profitably, the application of chemical fertilizer increases the productivity and profitability of maize. To increase their ability to adapt to climate change, farmers must be educated on key components of the weather and its fluctuation, especially when the rains begin.

In order to counteract anticipated production losses brought on by climate change, the study suggests that the fertilizer rates applied to millet in both climatic scenarios be reversed. Future climate change will reduce the amount of food that can be grown on all types of farms, but large farms will still be able to meet their energy needs without importing food. The capacity of each Farm type to choose an appropriate planting date while taking into account the allotted planting date window for each specific crop is a requirement for addressing smallholder food sufficiency.

There is a gap in this study because this experiment concentrated more on crop production whereas the current study concentrates on the difficulties of adjusting to climate change.

2.7.3 Studies from Lesotho

In a research project titled Exploring Community and Ecosystem-based Adaptation through Resilience Theory: Referencing a Lesotho Case, A. Keziah Mayer (2022) investigated climate change and adaptation. For technique, the researcher employed a qualitative approach. The study concluded that the effects of climate change would be felt by society and the environment, necessitating adaptation measures resembling a social-ecological system (SES). Community and Ecosystem-based Adaptation (ECbA) is one of the possibly effective options; nonetheless, it is a new idea that requires additional research to see whether it is an appropriate strategy for increasing social and environmental resilience.

Community and Ecosystem-based Adaptation (CEbA) could be a viable option, but because it is a novel idea, additional research is needed to evaluate whether it is a viable adaptation approach that also improves social and environmental resilience.

The study's goal was to look into CEbA's ability to improve people's lives and the environmental resilience of emerging rural communities. Previous research has identified seven generic principles for improving the resilience of targeted ecosystem services (ES) in the face of change and uncertainty. Recent academic work has expanded sustainability science by developing context-specific measurements for the seven resilience principles, allowing researchers to quantify SES resilience indirectly. These metrics were customized for the Lesotho CEbA case study scenario in this study.

Two previously unrelated domains were combined and used as a new way to analyze the effects of CEbA. This study discovered six features that identify a CEbA project. To indirectly measure the project's impact on SES resilience, the Lesotho Climate Change Adaptation Project was examined against context-specific metrics of the seven resilience principles.

It was discovered that CEbA's distinctive approaches and concepts match the seven resilience principles, and that CEbA has the ability to improve the resilience of ES as well as the resilience of the communities who rely on them.

The study recommends that change agents use this knowledge to encourage the implementation of CEbA in resource-constrained rural communities. This project's methodology and metrics can be adapted to diverse contexts and used as indicators to analyze CEbA's impact on resilience. This could help advance sustainability science and initiatives focused at assisting communities in adapting to climate change and increasing their resilience.

Both this study and the present study focus on climate change adaptation by rural communities in Lesotho but this past study was specific on which part of Lesotho it is focusing on. Lesotho is divided into the lowlands, the highlands and the foothills and the three parts experience climate change differently. This present study focuses on climate change adaptation in the lowlands in the Mafeteng district. The location becomes a gap in this study because studies are conducted in different locations of Lesotho even though the topics are similar.

2.8 Summary

This chapter discusses the literature on climate change adaptation and how other scholars discussed about climate adaptation and its strategies and what they recommend as possible applicable strategies to help people adapt to climate change. It also discusses the theory that supports this study and what other scholars focused more on climate change adaptation which

appears to be a gap in this present study. Next chapter discusses research methodology utilized for this study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The researcher will outline the procedure on how data collection was carried out from using a specific research paradigm, in this chapter, and which methods were used. The chapter also discusses how data was collected from a certain number of respondents using specific research instruments. The chapter shows how true and valid the collected data is and lastly how the researcher protects the respondents from publicizing their responses.

3.2 Research Paradigm

The interpretive paradigm was used by the researcher. This is a paradigm that holds that reality is formed socially, is multidimensional, and subjective. That is, someone's reality can be understood by their experience of it, which may differ from another person's according to the individual's historical or social perspective. To develop a rich and thorough understanding of the phenomena under examination, the interpretive technique relies on inquiry and observation (Bailey, 2020).

The interpretive paradigm is founded on a conversation between researchers and subjects in order to collaborate and generate meaningful understanding of reality. This understanding is specific to a specific period and context and so cannot be generalized. The interpretive method includes interviews, observations, and textual analysis (Hennink, 2020).

The technique was chosen because subjects such as cross-cultural variations in companies, questions of ethics, leadership, and study of variables influencing leadership may be researched in great depth. Primary data obtained through Interpretivism research may have a high level of validity since the data in such studies is trustworthy and honest.

The technique was chosen because themes such as cross-cultural differences in businesses, questions of ethics, leadership, and the study of variables impacting leadership may be thoroughly explored. Because the data in such studies is trustworthy and honest, primary data gathered through Interpretivism research may have a high level of validity (Flick, 2009).

3.3 Research Methodology

The qualitative method was applied in this study endeavor. Qualitative research is defined as a method of information collecting that depends on open-ended and conversational discourse.

According to Taylor (2016), qualitative methodology is more than a set of data collecting tools, just as quantitative methodology is more than a set of data gathering techniques. It is so large because it is a research project that generates descriptive data—people own written or spoken words and observable behavior. It is so huge that it interacts with people's written and spoken words as well as observable behavior when producing descriptive data. According to Hennink et al. (2020), the qualitative approach consists of four interlinked tasks: creating research questions and objectives, examining research literature and incorporating theory, developing a theoretical framework, and selecting qualitative research methodologies.

Based on the responses of the respondents, qualitative technique allows for more in-depth and detailed analyses and queries. The researcher attempts to comprehend the respondents' sentiments and motivations by putting herself in their shoes.

With regard to a specific issue, qualitative research methodology is aimed to aid in revealing the behaviour and perceptions of a target population. In-depth interviews, focus groups, ethnographic research, content analysis, and case study research are all common types of qualitative research methods. The outcomes of qualitative technique are more descriptive, and inferences may be derived from the data acquired relatively simply (Bailey, 2020).

3.4 Research Design

The study employed the case study design. Since the target of this research was Mafeteng district, the researcher used only Mafeteng as her case study. Since the target of research is Mafeteng district, the researcher will be using only Mafeteng as her case study and not going around Lesotho to collect data.

3.4.1 Record Keeping:

This strategy uses established, trustworthy documents and other similar sources of information as the data source. This can help with new investigations. This is analogous to going to the library. The individual can scour books and other sources for pertinent facts that will most likely be employed in the research (Bailey, 2020).

3.3.2 Process of Observation

This study approach uses subjective methods to collect systematic information data. The primary focus of qualitative observation is the study practice of applying subjective methodologies to collect data or information. Quality contrasts are primarily compared via subjective perception where subjective perception is in charge of five important tactile organs and their functions: sight, smell, touch, taste, and hearing. This requires traits rather than measures or numbers (Flick, 2009).

This is where researcher observed with her own eyes if the trees were growing well or the dongas had been gotten rid of without necessarily asking anyone. The researcher was able to tell by just looking at the respondents' work whether the applied strategies had succeeded or failed (Tylor, 2016).

3.5 Research Instruments

The following are instruments the researcher used for data collection.

3.5.1 One-on-one Interview

A one-on-one interview is a conversation with just one respondent. This strategy is entirely conversational, and it allows you to elicit precise information from the respondent (Tylor, 2016)

It allows the researcher to learn exactly what others think and why they do what they do. If the researcher is knowledgeable, asking the right questions can aid in the collecting of relevant data. The researchers should follow up with inquiries that will allow them to obtain further data if necessary.

These interviews, which can be conducted in person or over the phone, can last anywhere from 30 minutes to two hours or more. When the in-depth interview is conducted face-to-face, it is easier to comprehend the respondents' body language and match their comments (Weaver-Hightowe, 2018).

When the in-depth interview is conducted face to face, it is easier to comprehend the respondents' nonverbal signals and match their statements.

3.5.2 Focus Groups

A focus group was used to obtain data. Typically, it includes a limited number of participants (6-10) from your target group (Miller, 2008). The focus group's main goal is to obtain answers to the "why," "what," and "how" questions. It is advantageous because the researcher is not required to be present during the investigation. Nowadays, focus groups can be conducted electronically via online surveys from various devices, making work faster and easier, however they are more expensive than traditional approaches. They are typically used to describe complex processes.

It was used in this research because the researcher wanted data not only from the rural community, but also from the government officials in the two Ministries that focus on climate change and adaptation. These Ministries are the Ministry of Natural Resources and the Ministry of Defense, National Security and Environment (previously known as Ministry of Meteorology). The respondents in this Ministry have a better access to technology than those in the rural areas in Mafeteng, so it was more efficient to use focus group discussions to collect data from these divergent groups.

3.5.3 Ethnographic Research

Ethnographic examination is the most strategy for acquiring the relational data that reviews individuals in their normal setting (Hennink, 2020). The researcher must adapt to the participants' environments using this method, which may sometimes take place in big cities or in remote areas. While gathering information, topographical requirements can be a difficulty. This intends to enjoy the way of life, its obstacles, inspirations, and sceneries.

Hennink (2020) further clarifies that rather than focusing solely on meetings and chats, the scientist might directly interact with the natural settings. This type of investigation technique can last from a few days to several years because it incorporates in-depth perceptions and information collection on those grounds. It is very difficult, takes a long time, and relies solely on the researcher's expertise to analyze, observe, and infer the data.

In this project, researcher observed the people employed in *fato-fato* for getting rid of dongas and planting trees. Because they work in groups, the researcher was not forced to form her own groups for data collection but used the already formed groups to collect data by observing the behaviour of the respondents as they are working without directly interacting with them and sometimes disturbing them while doing their work.

3.6 Population and Sampling

Mafeteng community is the entire population from which someone wants to draw conclusions. Population can be defined by many factors, including age, income and location.

From the population we derive our sample. A sample is thus defined as the set of people from whom the researcher will collect data (Weaver-Hightowe, 2018). A sample is made up of two parts: the sample frame and the sample size. According to Baily (2020), sample frame is the list of people from which the sample will be drawn, and it should include the entire population, while the sample size is the number of people who should be included in the sample based on factors such as population size and variability, as well as the research design. The researcher will collect data from fifty (50) participants. Purposive sampling and quota sampling are non-probability sampling methods that the researcher used.

3.7 Data Collection Procedure

The research first conducted interviews physically and electronically in the two ministries for a week using stationary (notepad and pen), her cell phone and laptop to collect data. Then the second week she collected data from the six villages for three weeks using all the above mentioned methods of data collection. She used her mobile phone to record and capture images in those villages and use taxis to travel to different villages. She used stationary to write responses from respondents while interviewing them especially from those who are illiterate.

3.8 Credibility

Credibility is seen when the results of the research reflect the views and opinions of the people under study. Hennink (2020) describes it as an evaluation of the findings indicating a "reliable" data derived from the participant's original data or the accuracy of the data. Theoretical conceptions must be generalizable and transferable, which implies they must be adaptable to other situations that are analogous to the current one. This emphasizes the value of detailed descriptions so that the reader has information to draw conclusions from.

To improve the credibility of the current study, the researcher took a variety of actions. She used extended engagement, which means she took the time to research cultural norms, check for inaccurate information, and develop relationships. This was learned by the researcher through reading pertinent documents and traveling to the locations where the projects were carried out.

The researcher also employed continuous observation to monitor how various adaption techniques to climate change are doing after being put into practice (Bours, 2014). For instance, how did soil erosion change after the removal of dongas, especially in light of the recent severe rains.

This study also used triangulation (Flick, 2009), which implies the researcher drew results from a large number of sources. This entailed gathering information from many sources, using various data collection methods, and working with several investigators. The researcher was able to detect accurate information by using triangulation. For example, the researcher conducted a review of literature to become acquainted with the content of the phenomenon under inquiry before gathering data through a focus group interview to obtain in-depth information.

A different sort of triangulation involved a large number of individuals. There was only one way to triangulate using data sources. Personal perspectives and experiences were validated in comparison to others, and a picture of the attitudes, needs, or behavior of those under inspection was finally formed based on the contributions of a variety of persons.

3.9 Ethical Considerations

The researcher used informed consent (Flick, 2009). This means that the researcher did not collect data without the knowledge or the permission of the respondent. On use of observation, participants were made aware of the project and how the findings would be used.

Secondly, voluntary participation was used in this research. This means that people were not forced to participate and were free to withdraw anytime from the research project. Participants chose to withdraw from the project were not be pressured to continue and were not expected to give explanations as to why they decided to withdraw (Hennink, 2020).

Thirdly, the researcher maintained confidentiality. Any identified information was not available to or accessed by anyone but the project supervisor. Lastly, anonymity was also used

in this research project. Anonymity means that the identity of the participant remained unknown to the research team (Bailey, 2020).

3.10 Summary

This chapter outlined the data collection procedure. It discussed the methods and instruments used for data collection, how true the collected (primary) data was in this project and lastly how participants and their identities were protected throughout the study. The next chapter discuses study's findings.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

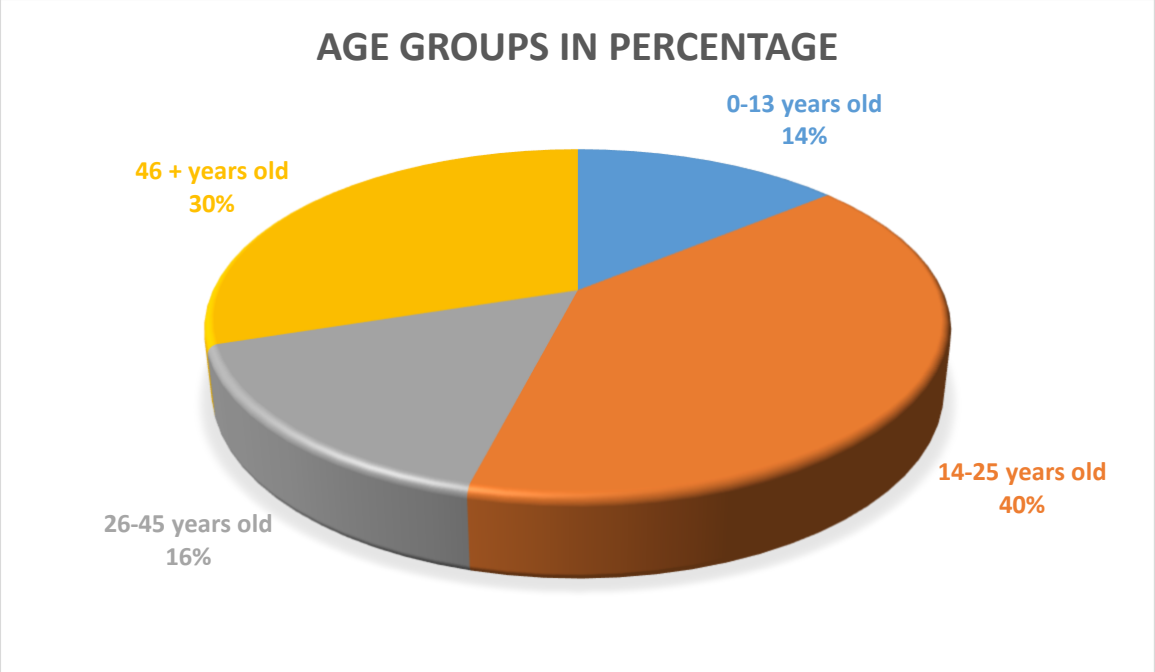
In this chapter content analysis is used to examine data. Demographic characteristics of respondents are discussed first. Moreover, the researcher used collected data from the residents of Makaung in selected villages. Data was scrutinized by creating thematic topics drawn from the objectives of the research.

4.2 Demographic Characteristics of Respondents

The researcher targeted community members aged from ten (10) years old and above because the researcher wanted to include the students in her study. Majority of the residents in Makaung are Basotho and very few of them are employed because in this area most household owners are above fifty years of age. Most people depend on subsistence farming as a means to improve their livelihood. In addition, people in this area are mostly married, literate and are home-owners.

The pie chart in figure 4.1 shows the age groups of participants and their percentage. The pie chart shows different age groups of the respondents and their percentages, the majority of whom are in the age group 14-25 years old with 40%, followed by 46 plus years old with 30%, then 26 to 45 with 16%, and lastly o-13 years with 14%. Age group 14-25 seems to be the majority in the area, perhaps because most of them are still staying home with their parents or still going to school. The 46 plus years' age group is composed of adult parents who might be now settled at home while 26-45 years' group are active and might have crossed the border to the neighboring country for employment on industrial sectors.

Figure 4.1: Age groups in Percentages (Source: Primary Data)



4.3 Causes of Climate Change

Lesotho is a very small developing country that contributes almost nothing to climate change but it is hugely affected by climate change negatively. Greenhouse gas emissions soaked the earth, which trap solar heat but due to industrialization that has destroyed the ozone layer this leads to global warming and climate change, as a result the world is rapidly warming than at any point in recorded history (Environment, 2022).

4.3.1 Generating Power

World emissions are produced largely when fossil fuels are burned to produce power and heat, these include coal, oil, and natural gas. However, renewable resources such as wind and solar energy still produce a quarter of the world's electricity (Houghton & Bruce, 1995). The study however established that very little of these emissions occur in Lesotho, neither are they generated from Africa where industrialization is at its lowest ebb. The emissions are from industrialized countries like USA, Japan, Europe, China, among many others. Nonetheless, global warming affects developing countries most, the majority of which are in Africa, including Lesotho.

4.3.2 Manufacturing Goods

Manufacturing and industry emit emissions mostly as a result of the use of fossil fuels to provide energy for the production of goods such as textiles, electronics, plastics, cement, iron, and steel. Gases that are harmful to the environment, such as methane and carbon monoxide,

are also emitted during mining and other industrial processes. Manufacturing and industry generate emissions that originate from the combustion of fossil fuels to produce energy for the manufacturing of textiles, electronics, plastics, steel, cement, and iron.

4.3.3 Cutting Down Forests

Emissions rise when trees are cut down because they produce carbon while clearing forests for farms, pastures, or other uses. Because trees inhale carbon dioxide, cutting them down reduces nature's ability to keep emissions from entering the atmosphere. Of course, trees are felled for settlement and agricultural purposes (Houghton & Bruce, 1995). Given the damage caused by global warming to Lesotho, this may have only a minor impact on global warming for a developing country like Lesotho.

4.3.4 Using Transportation

Most cars, ships, airplanes and trucks primarily use fossil fuel. For this matter, greenhouse gas emissions like carbon dioxide are exacerbated by the transport sector. The majority of pollutants are mostly made up by road vehicles, even though ships and airplanes emissions still rise (Cobbinah, 2014). Lesotho makes a very small contribution to this area, as was already shown above.

4.3.5 Producing Food

To run farm equipment or fishing boats needs energy to produce food, usually with fossil fuels. Emissions are also caused by planting crops. Powerful greenhouse gas- methane is produced by cattle. Also packaging and distributing food cause emissions (Barrang-Ford, 2011). Still, Lesotho’s contribution here has no significance on climate change and global warming since most of her food products. Still, Lesotho’s contribution here has no significance on climate on climate change and global warming since most of her food products are either imported or produced through the conventional and traditional forms which are slow and cumbersome but environment friendly.

4.3.6 Powering Buildings

Commercial and residential structures produce a measurable amount of green gas emissions. This is electricity that is used worldwide since they use coal, natural gas, and oil for cooling and heating (Filho, 2017). The conclusion in this section is the same as in the ones above. In terms of these frameworks, Lesotho is still very far behind.

4.3.7 Consuming Too Much

According to (Alemu, 2018)The amount of waste individuals produces, how people move around, what people consume, and how much energy is used in houses all these have a hand to greenhouse gas emissions. This might not be a big problem because people do not have enough to meet their consumption needs. Even if they dispose of they have into the bush and the environment, it is of very minimal significance when compared to what the affluent communities do.

4.4 Effects of Climate Change on Daily Practices

Many people have been negatively affected by climate change in this Makaung. Since the climate change crisis globally, many people have struggled to adapt to the fluctuating temperatures and it has affected their way of doing things on daily basis.

Some community members complain that children are no longer able to play outside like they used to in past years because of extreme temperatures because some kids were exposed to diseases like dehydration or headache if it is too hot. Some suffer from severe common cold and are forced to stay at home and miss school especially after COVID-19 pandemic. Even old people argued that their farming has declined. This is because it becomes too dry or too wet but it is mostly very dry in Makaung because Mafeteng is the driest and hottest district in Lesotho.

During interview, one community member said:

"This issue of climate change has complicated our lives so much that we are no longer sure about the ploughing season, we just sow seeds and trust God because everything has changed."

This was one response to the question of how climate change has affected their daily practices. Moreover, one student also complained,

"We are unable to effectively attend school because of overflowing river that we cross on our way to school."

Because of climate change, most people had their food security threatened as many people end up harvesting nothing during the harvest season. One respondent said,

"We spent a lot of money during the ploughing season but due to unpredictable weather, we end up harvesting nothing which turned out to be the greatest loss and since most of us are unemployed, we become discouraged to try again the following year."

Climate change has shifted all the four seasons of the year and this has also changed the ploughing season. In this era of climate change, most residents complained that they are not harvesting much like in the past years. One complained,

"The plants are being destroyed by the extreme draught and heavy rainfall, damaged roads and bridges has also affected our daily movement from one place to another. Furthermore, we are also forced to change roofing for our houses in order to accommodate strong winds which is very costly."

Most residents were not aware of climate change until the government raised awareness. Besides the cost of ploughing, most of them complained about negligence by the government in terms of infrastructure. One respondent sadly said,

"Since democracy in 1990 when Basotho Congress Party (BCP) won elections, we have been voting and elected someone to represent us but since then, no one cared about Makaung or fulfilled any of their promises to us, after winning the constituency, they disappear and we will see them again when the ask for our votes for the next elections, we have come to a point where we no longer see any use of voting, it is as if we are forgotten by our leaders yet we are not far from town"

Most villagers draw water from wells and rivers for drinking which expose them to different life threats like diseases or being murdered or raped along the way.

In Makaung, during the dry season, women are expected to travel long distances to draw water from wells and rivers for household use and the fall victims in this case. Some of the villagers bought water tanks to use for household activities but most of them cannot afford them. Those who have them said that because of extreme draughts in Makaung, they are unable to keep water in tanks for long and they end up joining others to rivers.

In addition, students who cross rivers to and from school are unable to go to school during rainy season because that is when the rivers will be overflowing and impossible to cross to the other side. This impacts negatively to their performance on their studies because they miss too many classes. The researcher recorded one student saying,

"When it has rained a lot, the river overflows and we forced to stay at home until the water has reduced and classes still continue in our absence as if nothing happened because we do not have any means to cross to the other side. This affects our performance at school and some

fail because it is not easy to cover everything that we missed. Sometimes it rains for days and that means we spend days without attending school."

Lastly from what the researcher observed, some community members from other villages especially those who cross the river to get to town are now forced to walk long distances on food because vehicles are unable to cross to the other side because the bridge they had been using is now damaged from heavy rains and floods.

4.5 Government Intervention

Since the climate change, the ploughing season and the harvest seasons have shifted and due to heavy rainfalls and extreme drought, most residents are unable to harvest much like they did before and most of them have not yet adapted to the new method of planting that preserve moisture in the soil. Mitigation projects are initiated to combat climate change and this is done by government in collaboration with development partners.

Droughts, rising temperatures, and more frequent extreme weather occurrences are challenges faced by farmers in Lesotho. Additionally, as more people relocate as a result of the changing climate, fresh conflicts are emerging. Over-cultivation, over-grazing, and over-harvesting have pushed ecosystems to their breaking points as communities are compelled to do actions that strain the land beyond its capacity, with the Basotho people of Lesotho suffering the consequences.

UNDP (2020), in partnership with the government, aims to assist farmers in adapting and strengthening their resilience through creative programs that are designed to change the way they grow crops, raise livestock, and manage their natural resources.

The researcher asked the project manager from the Ministry of Forestry how they help community members to understand climate change, she said,

"we do public gatherings and trainings by asking for permission from the area chief first so that the chief can inform his/her community well in time about the government officials who will visit them. We normally agree on a date of visit with the chief so that on the day of training, majority of people are able to attend."

When asked which strategies have been applied so far, she responded,

"We introduce key-hole gardening, shade nets, water tanks, ponds, food for work (fato-fato) and short cycled livestock which include ducks, chicken and seeds. Our project uses Environment act 2008 and Forestry act 1998 so that the project is legally protected."

The Ministry of Forestry and Agriculture work hand in hand to educate people about climate change and when to plant certain crops because most residents were not aware that seasons have changed. The government raises awareness through public gatherings and trainings to help community members to understand the issue and to help them to accept easily new weather changes.

The researcher also asked if there are any non-governmental organizations (NGOs) involved in this projects and she said,

"The government of Lesotho seek help from some of these non-governmental organizations for funding because the government on its own is bankrupt, these include IACOV which is a project funded by both WFP and UN, WAMPP and ReNOKA."

The researcher also surfed the internet to fully understand these NGOs and the legal framework that support climate change in Lesotho and they are discussed in detail below.

4.6 Adaptation Strategies

The Lesotho government introduced a number of strategies of climate change adaptation in Makaung. It has introduced different projects to combat soil erosion and also make known to short-cycled livestock through the IACOV project which hosted different strategies on how to adjust to new conditions brought by climate change. The project trained community members about smart subsistence farming so that they can produce vegetables all year round despite climate change. Each household was supplied with free seeds for different vegetables to produce enough vegetables for household consumption (AdaptationFund, 2021).

IACOV is a four-year initiative funded by the Adaptation Fund in the amount of one hundred and fifty million Maloti (150 Million Maloti). The project is initiated by the Lesotho government, through the Ministry of Forestry, Range and Soil Conservation, and the Lesotho Meteorological Services, in collaboration with the World Food Programme (WFP, 2023). Its mission is to address the impediments to climate change adaptation by enhancing the government's capability on early warning indicators. The project focuses on women and children, who are the most vulnerable and affected by climate change and have few options for

survival. Members of the community were given the authority to plan and carry out relevant resilience-building initiatives that will alter lives and diversify livelihoods.

It is divided into three components (Environment, 2022) (a) to strengthen government to produce climate data and encourage its use in order to estimate the likelihood of climate shocks, encourage early action, and jointly create community-specific, locally relevant climate services; (b) to increase knowledge of communities, women, young people, HIV-positive individuals, and other vulnerable populations, for seasonal planning and climate risk management- the importance of adaptation and (c) Focus on strengthening communities' understanding of community-based planning processes that support the implementation of suitable resilience-building and adaptation interventions that develop long-term assets that ensure income diversification and market access.

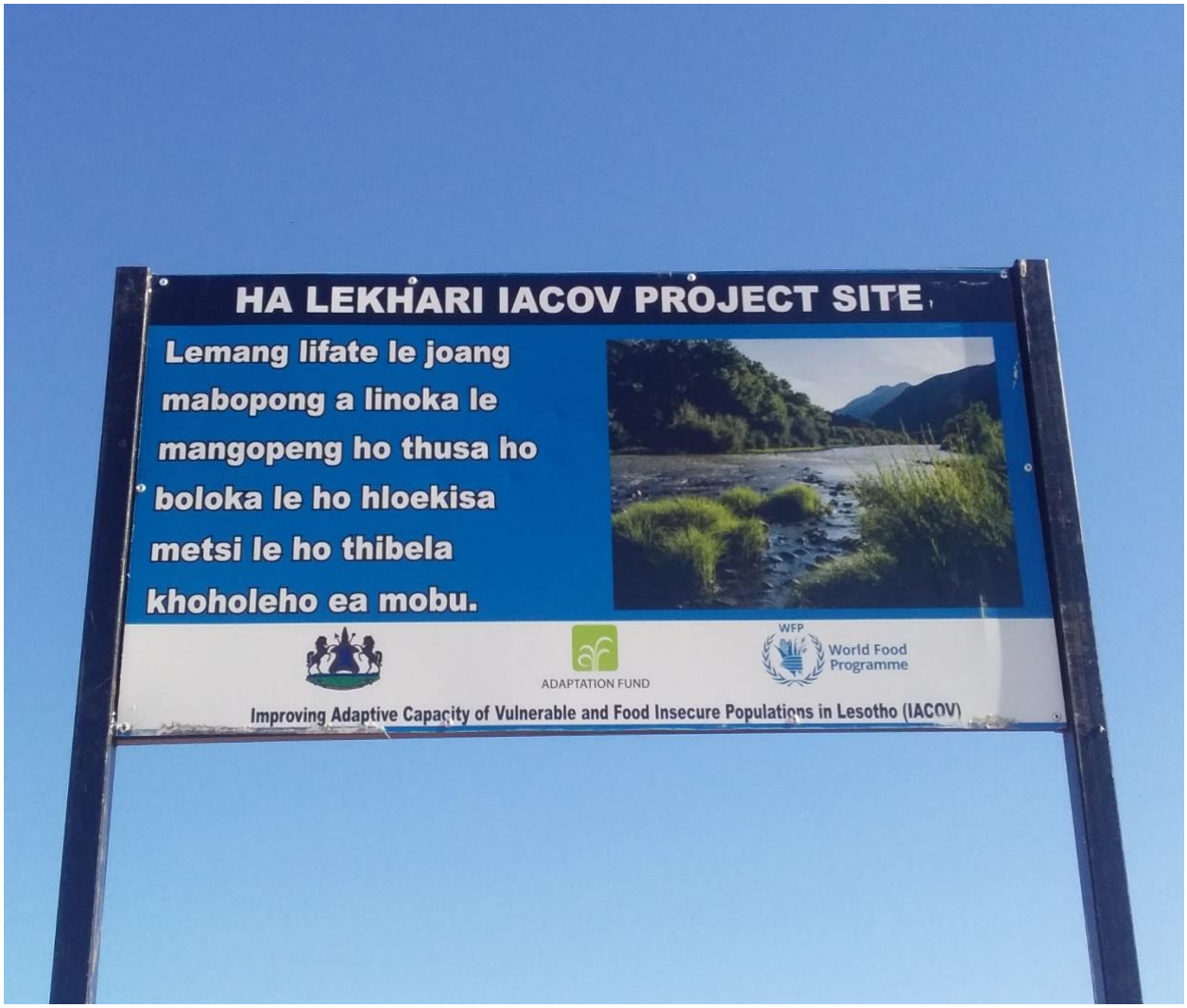
In addition, the project also supplied tools to use in getting rid of dongas in Makaung region. The residents were also supplied with trees seedlings to prevent soil erosion; those trees were planted in dongas and areas and around the fields so as to restore lost soil and the ecosystem. There are villages where the strong winds and heavy rainfalls destroyed houses and assistance was brought by the government through the then Ministry of Meteorology built houses for people who were affected.

Firstly, it introduced key-hole gardening through (FAO, 2020). This is a heaped circular garden bed that has an indentation in the shape of a keyhole on one side. Gardeners may easily access the garden through the indentation to add uncooked vegetable scraps, gray water, and manure to the composting basket that is located in the middle of the bed. In order to give the garden a firm structure and to assist keep moisture in the bed, the walls are typically made of stone.

The government understood that keyhole gardens are an effective, low-cost alternative for feeding rural residents. Keyhole gardens are advantageous since they occupy a little amount of space, use less water for irrigation, and prevent animals from consuming the produce owing to raised beds. Secondly, the government gave people shade nets to the community members so that they can cover and protect their key hole gardens from extreme temperatures like snow, frost, extreme heat from the sun and strong winds. These shade nets are able to block these fluctuating temperatures from damaging the crops.

The picture below is a board that is placed at the project side in Makaung.

Picture 4.1: The board at the Project site in Makaung (Source: Primary Data)



4.7 Legal Framework

The researcher found out that the respondent was not aware of the updated legal framework that the Ministries use to support their project. This is what the researcher found out from the internet. A National Climate Change Policy 2017–2027 was unveiled by Lesotho. To ensure that collaborators deal with the effects and causes of climate change through the identification, mainstreaming, and use of adaptation and mitigation measures while supporting sustainable development, the policy outlines twenty-two strategies.

One of its main goals is to foster climate-resilient social, economic, and environmental development. Another is to investigate low-carbon development opportunities on a national and international level to support resource sustainability. A third goal is to strengthen the framework for governance of climate change, building the capacity, international cooperation,

research and systematic observation, clean technology development, transfer, and use, education, training, and public awareness. (UN, 2022)

Apart from advocating for private sector investment, the strategy outlines tactics including legal and other institutional frameworks, resources, and an evaluation and monitoring Framework. The goal is to improve the implementation of policies while guaranteeing resource allocation that is suitable and communicating results to decision-makers and stakeholders for potential future action.

Secondly. National Forestry Policy (GOL, 2021) By protecting the tree covered on lands and enhancing the legislative and administrative framework associated to the sector, this policy primarily aims to reduce poverty, create jobs, and improve circumstances in the nation. Therefore, the citizens of Makaung cannot remove the tree plantations, this policy promotes tree planting initiatives there. It is expected that the locals will guard those trees.

Thirdly, Lesotho Vision 2020 (UNDP, 2020). The vision aimed to ensure Lesotho is a stable nation, that it is at peace, it is developed, that it has gained wealth and is conducive environment to live in by 2020. It encouraged the creation and consumption of renewable energy as well as better land use planning (to prevent desertification, safeguard forests, and preserve ecosystems).

Furthermore, there is also Lesotho Energy Policy 2015-2025 (FAO, 2018). With the use of bioenergy, renewable energy sources, and energy efficiency, this policy intends to give Lesotho inhabitants access to an inexpensive, dependable, and environmentally friendly energy supply.

Lastly, there is Environmental Law which protects the environment in general. For example, it illegal to cut trees without the permission of the chief in that particular area, if in need, the resident asks for permission the chief or buy it from somewhere else (Environment, 2022).

4.8 Challenges of Adaptation Strategies

The major challenge of adaptation is most strategies are long term and most people are impatient when the results take a longer time to show and end up going back to their old ways of doing things. Secondly, the project managers do not effectively follow up the projects; they take too long to check how the project is going and some of them end up failing.

Furthermore, from what the researcher observed, Makaung is a very dry place, villages like Ha Lekhari and Ts'ieng, villagers have to travel long distances to draw water and this affects the project because they not have enough water to water the vegetables on daily basis. The community members rely mostly rain water and if it takes too long for the rain to fall, their plants die and they have to keep the project countless times without success.

There is also no law enforcement in this area that protect the project sites because the laws are there that protect the project but they are not enforced on community members. For example, one community member told the researcher that,

"Sometimes after knocking off at 12:00 noon from work, the herd boys let their animals to graze in the area where they planted trees or vegetables and therefore end up destroying those plantations and nothing is done about that."

She said. She also added that the laws that protect the project are there but are not practiced on community members and the workers are forced to fix the damage on their own.

One community member also told the researcher that they normally contribute a certain amount of money and buy themselves chickens collectively because they are normally cheaper that way. This respondent said,

"After receiving the monthly stipends, we contributed 300 Maloti each to buy up to six indigenous chickens collectively last year per household. We contributed but unfortunately we did not get the chickens until today, the chief intervened and solved the matter because we heard that the foreman has used that money for her personal purposes and she is yet to order those chickens and she promised us that they will be available from April till May because they are sold with batches."

Data collection was completed before chickens were delivered to the villagers.

4.9 Non-Governmental Organizations

The Lesotho government is cooperating with some non-governmental organizations to help in the adaptation of climate change. These include:

- **Improving Adaptive Capacity of Vulnerable and Food Insecure population in Lesotho (IACOV) – It is sponsored by Adaptation Fund.**

The aim of the project is to solidify the ability of the government of Lesotho and Basotho to adapt to climate change by improving early warning , early action systems, profound awareness raising as well as ensuring social behavioral change, to empower communities in planning and implementing and enabling community-based planning procedures that promote the implementation of suitable resilience-building and adaptation actions that produce long-lasting assets and ensure income diversification and market access (AdaptationFund, 2022)

- **World Food Programme (WFP)**

  Lesotho is at risk to climate change effects; livestock is lost due to drought that already affects harvest yields. The climate that keeps on fluctuating results in droughts and frequent and intense floods, with less snow on the mountains and an increase in run-off rates, soil-erosion worsens and depletes the soil that is rich in nutrients. There are some adaptation measures that taken like planting fruit trees but the country lacks the resources for extensive mitigation (WFP, 2023).

- **Wool and Mohair Promotion Project (WAMPP)**

  Helping the poor is the aim of the project, together with helping small-scale wool and mohair farmers to become more resilient to the negative effects of climate change and economic shocks. Project assists communities in dealing with difficulties brought by climate change by discouraging overgrazing and enforcing laws on environment (FAO, 2018).

- **ReNOKA (‘we are a river’)**

  It aims to create broad awareness and understanding of Integrated Catchment Management (ICM), climate change, the responsibilities of land and water users. While institutionalizing Integrated Catchment Management under full implementation in Lesotho, based on equity and climate adaptation principles, is the ReNOKA's specific purpose, the general goal of the initiative is to support socioeconomic development and adaption to climate change in Lesotho (ReNOKA, 2022).

4.10 Adaptation Progress

The respondent was asked if there is any progress in climate adaptation in Lesotho, she said there is a huge progress because there is improvement in the livelihood in Makaung. The government of Lesotho is aware of climate change and it has intervened by introducing

different strategies on how people can adapt to the changes of the climate in the country. From what the researcher observed there is a little progress although it is very slow.

4.11 Summary

This chapter analyzed and presented data that was collected in Mafeteng district at Makaung. The researcher focused on specific demographical characteristics of respondents like age, gender, household ownership and many more which were helpful in data analysis. According to collected data, different strategies of climate change adaptation have been implemented in Makaung although there are challenges which hinders the success of those strategies. These strategies include planting trees in the veld and getting rid of dongas (*fato-fato)* to minimize soil erosion and dissertation, free seeds vegetables patches and livestock were provided for each household. The government of Lesotho through IACOV held trainings and called public gatherings at Makaung to enlighten the community members about climate change and how they can adapt to the temperature changes. On the next chapter summary of the study and conclusions drawn and recommendations from the study are presented.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In this chapter, the study will be summarized based on objectives and from the collected data. The chapter will make conclusions on why Makaung community members still struggle to adapt to climate change even after the implementation of different adaptation strategies. Recommendations will be suggested on how efficiently the strategies can be implemented in future.

5.2 Summary

The study explored the reasons why Makaung community still struggle to adapt to climate change even after the government introduced different adaptation strategies in this area. The findings revealed that the community on its own has never devised any strategy to adapt to climate change but community members are fully depended on the government to solve the problem for them.

After realizing that the community members are not innovative enough to come up with adaptation strategies on climate change, the Lesotho government intervened by introducing different strategies. Through the ministry of forestry, IACOV was introduced in Makaung. Adaptation fund and World Food Programme together formed IACOV project which introduced community members to different adaptation strategies. This is a project that trained community members on how the manage soil erosion and address the issue of food security.

The study's foundation is action theory, which views adaptation as an activity and provides a framework for designing adaptation assessments, vulnerability analyses, and real adaptation actions. The government took action to help the Makaung community to adapt to climate change but COVID-19 outbreak in 2020 delayed the process because the projects had to stop due to strict rules of the pandemic. Some projects were destroyed as there was no follow up. The lack of movement stopped most adaptation strategies and it was impossible to take any action to implement the strategies.

Interpretive paradigm was applied because the researcher wanted to understand the reality of what community members go through on daily basis by directly talking to them and qualitative methodology in which a case study design was adopted. The researcher used some villages of

Makaung which included Sitisang, Ha Lekhari, ‘Mamaribana, Ts’ieng, Ha Mothokho and Ha Phepheng using purposive sampling and quota sampling for data collection to select members of the community who will participate in the study. Because some the villages are bit distant, the researcher interviewed some participants using mobile phone because of their schedules.

5.3 Conclusions

Firstly, climate change adaptation is still a major problem in Makaung although the government still apply different strategies to address the issue. This is because some needs of the community which might simply the process of adaptation are ignored. The government introduce strategies without considering the needs of the people first but expect the positive results. For example, Makaung residents struggle to access drinking water but the government introduces strategies that require watering vegetables and also drinking water to animals. This leads to failure of the project because community members are unable to have all the necessities of the project.

Secondly, the project managers take too long to follow up the project. They usually come and introduce the project and disappear for months without checking on the progress and the challenges that community members encounter along the ways are too big for them to solve on their own. For example, they are trained on how to plant vegetables and rear livestock but not on how to prevent pests that may cause damage to either the vegetables or livestock. Some of them were unable to harvest much or even multiply the chickens due to pests.

The project managers change from time to time and this causes confusion to the residents. They have to keep learning the new ways of dealing with the same project which is led by different project managers and some community members lose interest along the way and this also affects the success of the project.

From the findings, the researcher noticed that most government officials are not up to date with the regulations in their Ministries because one respondent told the researcher that they use Forestry Act (2008) yet there is already a recent legal Act being used by the Ministry as shown in the literature review.

Lastly there is no legal action taken on people who destroy the project or those who quit along the way before the project is completed yet they were donated seed or livestock like other community members.

5.4 Recommendations

Firstly, the government should enforce legal framework on the projects so that people cannot destroy the projects freely and nothing much is done to them because this encourages them to continue destroying the project as they already know that the punishment is not harsh. There should be clear project laws that can be easily understood by even people at the grassroots level.

Secondly, there should the formulated clear policies that guide the project implementation for both the project manager and the community members so that both parties can understand what they are expected to do. This may lead to the success of the project and avoid wasting of government resources.

Lastly, before introducing the project, the project managers should at least study the way the people in that particular area live on daily basis. This will enable the project managers to easily determine whether the project will be possible to implement or not beforehand. The necessary resources needed for implementation will be considered and discussed before the inception of the project and this will minimize the wastage of the limited resources.

5.5 Recommendations for Further Studies

The time allocated for the study is too short given that some things need more time to observe before drawing conclusions. The researcher was unable to see what really hinders people to adapt to climate change because some community members in some villages like Ha Lekhari and Ts'ieng did not apply strategies due to lack of water for watering.

Furthermore, some community members were not comfortable being recorded while participating in the study. The researcher was unable to see them in their natural behaviour because some of them refused to be recorded and some were not relaxed during data collection and the researcher was forced to jot everything down which required too much time.

Most community members wanted to know what they will get in return from participating in the study and some did not want to participate for free and this affected the process of data collection negatively as the researcher had to explain to them that she is not a government official but a student. Nowadays people do want to participate in projects for free because of high rate of unemployment and poverty.

The researcher would recommend that data collection period should at least take two months so that it is not rushed. Since most people in the rural areas do not understand these academic projects, the community members should be made aware of such projects so that they can actively participate in them.

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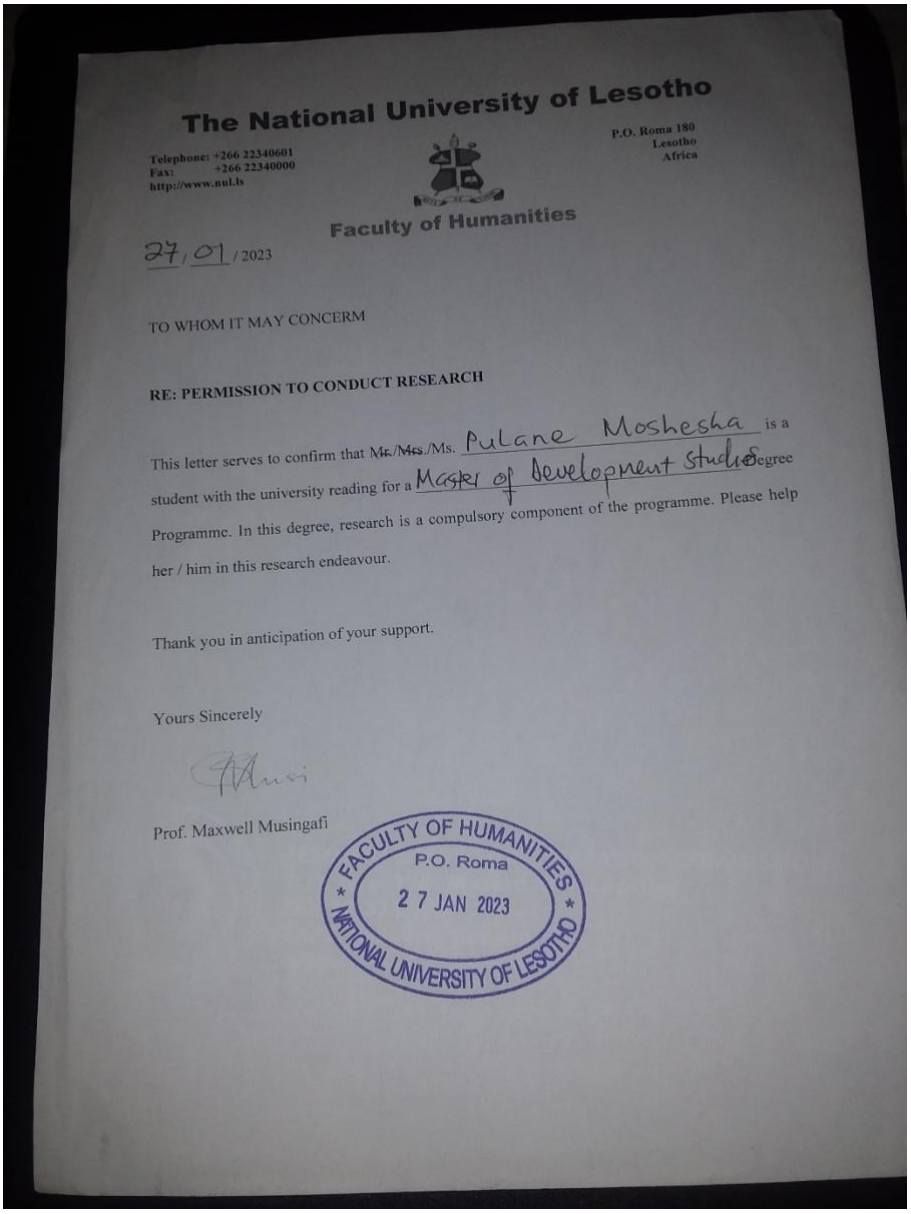
APPENDIX

COVERING LETTER FOR DATA COLLECTION PERMISSION



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27/01/2023

TO WHOM IT MAY CONCERM

RE: PERMISSION TO CONDUCT RESEARCH

This letter serves to confirm that ~~Mr./Mrs.~~/Ms. Pulane Moshesha is a student with the university reading for a Master of Development Studies Degree Programme. In this degree, research is a compulsory component of the programme. Please help her / him in this research endeavour.

Thank you in anticipation of your support.

Yours Sincerely

Prof. Maxwell Musingafi

FACULTY OF HUMANITIES
P.O. Roma
27 JAN 2023
NATIONAL UNIVERSITY OF LESOTHO

RESEARCH QUESTIONS

Questions to the Minister

1. What is the main role of the Ministry especially towards climate change adaptation?
2. How do you help the community members understand the issue of climate change?

3. Are there any strategies applied so far to help in the adaptation of climate change? If yes, which are strategies have been selected to which villages?
4. Is there any legal framework that supports those strategies? If yes, please state them.
5. Which villages in Makaung have been badly affected by climate change and how?
6. Is there any progress of climate change adaptation in Makaung among community members? Please support your answer.
7. Are there any Non-governmental organizations that you work with? Please state them.
8. How far do you think Lesotho is with the adaptation progress?
9. What do you recommend should be done to help community members adapt easily to climate change?

Questions to the Project Manager

1. What is the name of your project and how does it help in the adaptation of climate change?
2. What are the objectives of the project?
3. When was it implemented and how is the progress so far?
4. Do you have enough resources to run the project successfully?
5. After how long do you check the progress of the project?
6. Do you have any legal frameworks that support your project? If yes, which are they?
7. Do think the project is failing or succeeding? please support your answer.

Questions to the Community Members

1. How old are you?
2. How has climate change affected your daily practices?
3. Have you ever been directly affected by climate change? E.g. Has your house ever been blown away by strong winds?
4. Do you think the government is doing enough to help you adapt? If yes, how?
5. In your opinion, what do you think are the causes of climate change in your area?

6. Is there any law enforcement plan that supports the adaptation strategies in your village?
7. What challenges do you face in regard to the applied adaptation strategies?
8. What do you think the government should do to improve the adaptation process in Makaung?