

**NATIONAL UNIVERSITY OF LESOTHO**



**FEMININE IMPACT OF WATER SCARCITY ON RURAL  
LIVELIHOODS: THE CASE STUDY OF MAJAPERENG  
ELECTORAL DIVISION**

**BY**

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## DECLARATION

I, Refuoe Mpatlise declare that this dissertation: *Feminine impact of water scarcity on rural livelihoods: the case study of Majapereng Electoral Division* is the result of my own study and findings. A reference list has been included, and all sources other than my own have been properly credited. Additionally, I confirm that that this document has not been submitted to any University for the purpose of the obtaining any academic degree.

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## **DEDICATION**

I dedicate this work to all the women whose livelihood activities are directly and indirectly threatened by the scarcity of water. Everyone who made this work a success is recognised too.

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I would like to thank God for the gift of life and guidance throughout my academic journey. His constant presence in my life cannot go unnoticed.

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## **ABSTRACT**

*Water scarcity is a pressing issue in most developing countries where water resources are scarce with little support from the government. This study intended to investigate the feminine impact of water scarcity on rural livelihoods with specific focus on Majapereng Electoral Division. In order to gain in-depth insights into the subject matter, the study employed the qualitative research methodology. The findings of the study revealed that women participate in livelihood activities such as agriculture, livestock production and brewing traditional beer. Women have experienced a decline in agriculture, poor livestock production including low quality of wool, mohair, and meat as a result of the of water scarcity in Majapereng Electoral Division. The government, non-governmental organisations and the communities within Majapereng Electoral Division have adopted innovative strategies such as water harvesting, installation of solar powered community taps and construction of community dams to address water scarcity incidence in Majapereng Electoral Division. The study concludes that ensuring water availability and accessibility to women reduces the disproportionate burden placed on women and sustains their livelihoods. The study recommends collaboration between the Ministry of Gender, Youth and Social Development to address policies related to the Integrated Water Resource Management (IWRM) and incorporate gender in all stages of policy.*

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## **ACRONYMS**

<b>FAO</b>	Food and Agricultural Organisation
<b>IWM</b>	Integrated Water Management
<b>IWMI</b>	Integrated Water Management Institute
<b>JSA</b>	Jal Shakti Abhiyan
<b>LHWP</b>	Lesotho Highlands Water Project
<b>NRC</b>	Norwegian Refugee Council
<b>SADC</b>	Southern African Development Community
<b>SDGs</b>	Sustainable Development Goals
<b>UNHRSP</b>	United Nations Human Rights Screening Program
<b>UNICEF</b>	United Nations International Children’s Emergency Fund
<b>WHO</b>	World Health Organisation

## **CHAPTER ONE: INTRODUCTION**

### **1.1 Introduction**

Water plays an important role towards improving health and development of humans. The unavailability of water means that health and livelihoods of people are affected (Hutton & Chase, 2017). The scarcity of water is a global issue and if not addressed urgently, the entire world will face problems in the near future. The scarcity of water in most cases, affects people living in rural areas and to a larger extent women are specifically affected. The patriarchal society in which rural women live, it has resulted in women bearing the responsibility of domestic work, such as ensuring the availability of water in homes (Barech & Ainuddin, 2019). The two scholars further revealed that women in rural areas therefore, are mostly affected by the scarcity of water more than their urban counterparts and this has tempered with their equal access and distribution of water as well as people's livelihoods. The scarcity of water is a critical issue and the association between women and water requirements is of boundless importance, which depicts the practical necessities of women within the domestic domain at small scale (Barech & Ainuddin, 2019, WHO, 2023). Thus the issue of water scarcity also affects women more than men.

Women in rural areas often lack access to productive resources such as capital and land which hinders the possibility of their livelihoods (Jaka & Shava, 2018). Agriculture is the main source of livelihoods for rural women, and water scarcity, floods, cyclones, and heat waves affect crop production, leading to a decline in their income (Jaka & Shava 2018). Once income is affected then it means the living standard of women is also affected, causing poverty to some extent.

Women in remote areas often have less access to land and water rights, which can limit their capacity to build resilience and use coping strategies during times of crisis (Parker, 2021). This

leads to gender disparities and vulnerability. Women's capacity to build resilience and use of coping strategies during water scarcity is affected by their unequal access to land and water rights (Parker, 2021). In many regions women face discrimination in land rights, including access to communal land lands largely controlled by men and lack influence in natural resource governance decisions (Parker, 2021).

Against this background, this study intends to investigate the feminine impacts of water scarcity on rural livelihoods within Majapereng Electoral Division. Overall, the study wishes to provide insights into the feminine impacts of water scarcity on livelihoods and the need for gender responsive policies and action plans to achieve water security which will in turn advance many other parts of the Sustainable Development Goals (SDGs) agenda, particularly poverty reduction, health, education and work.

## **1.2 Background of the study**

Water scarcity is a global problem that affects billions of people around the world (Klobucista & Robbinson, 2023; Reid, 2023), and it impacts heavily on the rural livelihoods. Water scarcity hinders access to safe water for drinking and for practicing basic hygiene at home, in schools, and in healthcare facilities (UNICEF, 2020). According to the Norwegian Refugee Council (NRC), the scarcity of water has affected women's livelihoods, especially in the southern region of Iraq. Women are often responsible for farming and agricultural- related activities in Iraq, and the lack of water has led to the depletion of farmland, forcing some residents to uproot their lives and families (NRC, 2023).

The scarcity of water is not a new phenomenon in Africa. For instance, the scarcity of water has exacerbated poor sanitation and hygiene jointly posturing potential health hazards, specifically in low income regions of Kenya (Mulwa *et al.*, 2021). In addition, the incidence of water scarcity has

also led to the burden on women who are tasked with the responsibility of searching for water particularly for domestic use (Mulwa *et al.*, 2021). The burden placed on women impacts on their livelihoods as time spent on water collection could be allocated for other income-generating activities. The scarcity of water therefore has had diverse impacts on women's livelihoods in Kenya.

As most developing countries are confronted with the problem of water scarcity whose effect continuously hit hard on women, the incidence of water scarcity has also affected the South African Development Community (SADC). In Zimbabwe, women and their families become more vulnerable to poverty, hunger, and decline in living standards due to water shortages (Jaka & Shava, 2018; Koyratty *et al.*, 2021). Women are also forced to walk long distances, as far as 10 km, to collect water and firewood, leading to physical strain and less time for other activities (Matsengarwodzi, 2022). In this case, the effects of water scarcity have impacted women's rural livelihoods negatively, exacerbating poverty and communities' standards of living in Zimbabwe.

If any resource is to be found in abundance in Lesotho, that should be water. Economically, Lesotho is dependent on its water resources to create revenue for the country through the Lesotho Highlands Water Project (LHWP) (Oyebamiji, 2021; Workman, 2019). Workman further states that Lesotho transports to the Gauteng province, South Africa. Water is therefore one of Lesotho's major natural resources contributing 10% of the total Gross Domestic Product (GDP) (Workman, 2019). However, most people, especially living in rural areas still live without access to clean water and they may need to get their own water from unsecured sources, which might spread waterborne illnesses that interfere with day-to-day living spread, affecting daily life. Lesotho is confronted with inadequate supply of fresh water and sanitation and this incidence exacerbates

threats of economic disruptions, social tension, and even conflict on water resource at both domestic and international level (Oyebamiji, 2021).

In light of the above, water scarcity in rural areas perpetuates gender inequalities, as women often have limited decision- making power and access to water resources, hindering their ability to deal with the impacts of water scarcity and affecting their overall well- being and livelihoods. The incidence of water scarcity exemplifies how the lack of access to water resources can have gender-specific implications, influencing various aspects of women's and girl's livelihoods, including education, economic well- being and community dynamics.

### **1.3 Statement of the problem**

Despite the growing recognition of the impact of water scarcity on women empowerment, there is lack of research on how water scarcity impact on women's rural livelihoods. Scholars have focused on the impact of water scarcity on the health of women, but this study will focus on the feminine impact of water scarcity on rural livelihoods in Majapereng Electoral Division, Molepolole, Botswana. Even though, Botswana is famously acknowledged for its abundance in water resources, there are however areas that are experiencing the incidence of water scarcity. As water scarcity intensifies, women's livelihoods are at greater risk, with implications for their economic empowerment and overall well- being. Addressing the feminine impact of water scarcity on women's livelihoods in Majapereng Electoral Division is essential for promoting gender equality, and sustainable development.

### **1.4 Purpose of the study**

This study's purpose is to explore the feminine impacts of water scarcity on rural livelihoods, with a specific concentration on Majapereng Electoral Division.

### **1.5 Significance of the study**

The study may immensely contribute to the growing body of knowledge and evidence on the feminine impacts of water scarcity on rural livelihoods in Majapereng Electoral Division. This study may as well contribute to the provision of valuable insights and inform policies and programs aimed at addressing the problem of water scarcity. By discovering how the scarcity of water affects women's livelihoods in Majapereng Electoral Division, we may understand how water security may empower women by enhancing their livelihoods independence, enabling them to support themselves and their families.

### **1.6 Research objectives**

- To examine the livelihood strategies of women in Majapereng Electoral Division.
- To assess how water scarcity affects the livelihoods of women in Majapereng Electoral Division.
- To assess the interventions measures introduced to address the issue of water scarcity in Majapereng Electoral Division.

### **1.7 Research questions**

- What are the livelihood strategies of women in Majapereng Electoral Division?
- How does the scarcity of water affect the livelihoods of women in Majapereng Electoral Division?
- What are the intervention measures introduced by government to address the incidence of water scarcity in Majapereng Electoral Division?

## 1.8 Theoretical Framework

The study has adopted two theoretical models namely, Feminist Political Ecology and the Livelihoods Capitals Framework. Feminist Political Ecology according to Harcourt (2017), arises from the gendered critical analysis of environmental science, rights related to the environment, resource distribution and consumption, people's interaction with ecological, technical the environment. Feminist Political Ecology assesses how gender power relations determine access and control of resources across scales shaped by interactions with ecological, technological and political- economic processes (Elias *et al.*, 2021; Bacon *et al.*, 2021). This framework highlights the detrimental effect that gender disparities have on human health, the environment and sustainable development. These effects include reducing women's rights to own land, access energy, water, and sanitation facilities (Clement *et al.*, 2019).

Feminist Political Ecology is a relevant theory for understanding the impact of water scarcity on rural livelihoods, especially for women. Feminist Political Ecology examines the intersection of gender, power, and the environment and how these factors shape availability to resources and decision making, reflecting on the relevance to this study. In particular, this framework can help to identify the ways in which gender norms and power relations shape water access and use, and how these factors intersect with other social and environmental factors to impact on rural livelihoods.

As one other framework integrated in this study, the Livelihoods Capitals was developed to understand rural livelihoods particularly those of the poor (Gurukulam, 2009). Five core asset categories are identified by the framework or the types of capitals on which livelihoods are found. (Lax *et al.*, 2013).



The livelihoods capitals framework is an appropriate model for this study as it helps to recognise various resources and assets that women rely on for their well-being and survival in the face of water scarcity. The framework emphasizes the importance of different types of capitals in shaping livelihood strategies and reliance, therefore the livelihood capitals acts as an appropriate framework to incorporate in this study. Further, the resilient rural women's livelihoods for poverty alleviation and economic empowerment in some regions are hindered by lack of productive resources such as lack of land and capital, therefore, the livelihoods capitals framework provides a comprehensive lens to analyse the feminine impact of water scarcity on rural livelihoods, taking into account the various assets and resources they rely on.

### **1.7 Definition of key concepts**

**Feminine-** Mehta and Henry (2020) define feminine as generally understood to describe to a set of socialized psychological characteristics, that are most strongly linked to people whose assigned at birth is feminine. On the other hand, feminine is defined as the culturally constructed collection of qualities, behaviors, appearance, attributes, features, characteristics, postures associated with women (Vatsyayan, 2018). Feminine therefore can be explained as all character traits that are observed and approved as that of women.

**Water scarcity-** is a deficiency in the quantity of water required to satisfy a specific water demand (Gleick & Cooley, 2021). Dolan *et al.* (2021) also define water scarcity as lack of fresh water availability to meet the ordinary water demands in a given area. Water scarcity is therefore the inability of water to accommodate the requirements of individuals or community. For the interest of this study, the researcher adopted Gleick and Cooley, (2021) as a working definition of water scarcity.

**Livelihoods**- allude to the plans and possibilities people have to improve their quality of life, including their outcome, happiness, and food security as well as their reduced susceptibility to shocks and sustainable use of natural resources (De Bruin *et al.*, 2021). On the other hand, Turner (2017) defines livelihoods as approaches aimed to get a comprehensive, actor centered comprehension of the ways in which people and households collaborate to establish and maintain a source of income, often set within the context of poverty. In general, livelihoods can be defined as strategies and means by which individuals or communities make a living.

## **1.8 Research structure**

The study is such that it is divided into five (5) chapters

**Chapter 1** is the introduction and it introduces the research problem.

**Chapter 2** Reviews relevant literature in relation to the study.

**Chapter 3** is the research methodology and procedure of the study. Specifically, it will focus on the research design and strategy, population and sampling, research instruments, data collection procedure, data presentation and analysis procedure, research findings, data validity and reliability.

**Chapter 4**- Is the analysis of collected data.

**Chapter 5** is the summary, conclusions and recommendation of the study, It then draws conclusions from the research results and makes recommendations based on the study's findings for future research.

## **1.9 Chapter summary**

This chapter introduced the research problem of the study, the background of the study, statement of the problem, the purpose of the study, significance of the study, research objectives, research questions, and theoretical framework. Limitations of the study were deliberated. Definition of concepts used in this study and limitations of the study. Outline of research structure is stated. The following chapter will therefore discuss the overall literature review of the study.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter aims to review literature related to this study. Literature review is an examination of available publications related to the specific topic (Brendel *et al.*, 2020; Hempel, 2020). Literature review can be defined as an analysis of studies and findings related to the subject matter. In this study, literature to be reviewed in this chapter is related to the water scarcity impacts on rural livelihoods. In order to accomplish the aim of this chapter, the chapter is divided into three sections. The first section includes the exploration of various livelihood strategies adopted by rural villagers and the factors that influence their success. The second section deals with the disproportionate impact of water scarcity on women's livelihoods. The last part deals with the effective water management systems and livelihoods.

### **2.2 Water and sustainable rural livelihoods**

Rural villagers around the globe often face numerous challenges in securing steady livelihoods due to conditions such as limited opportunities to resources, market volatility and climate change (Kumar *et al.* 2019). In reaction to these encounters, rural villagers habitually adopt a variety of livelihood strategies to support themselves and their families. Globally, rural inhabitants often engage in livelihoods activities such as agriculture, horticulture, handicrafts and small scale business to mention a few. In China, for example, livelihood strategies for rural people include various approaches to income-generation and well-being. These strategies comprise of engaging in non- farming activities, part- time agriculture, and farming, with focus on disaster interference and mitigation and capacity to enhance livelihood repercussions (Zhou *et al.*, 2020). In addition, studies highlight the value of livelihood diversity, regional attributes of livelihood capital and the contribution of livelihood assets in shaping suitable strategies for poverty reduction and sustainable development (Zhu *et al.*, 2023; Mao *et al.*, 2020; Wei *et al.*, 2019). Generally, rural

households in China conform to their livelihood strategies supported by the factors such as income sources, savings, and social capital to navigate challenges and promote economic stability.

A study conducted in China reveals that agricultural development has experienced numerous obstacles and constraints such as water shortages (Shen *et al.*, 2020). The scarcity of water has reduced agricultural production and food security. For example, research reveals that droughts and unreliable water supplies undermine livestock production, an important livelihood activity for many rural communities in China (Zhang *et al.*, 2022). Another study in China discloses that the scarcity of water has forced the rural people, particularly women and children to spend time and resources collecting water from distant sources, thereby disrupting their livelihood activities (Xu *et al.*, 2022).

In rural areas of Africa, there are various livelihood strategies with a shift towards non-farm activities alongside traditional farming. Studies indicate a blend of farm, non-farm, and non-labor strategies emphasizing income diversification as important for food security and poverty reduction (Mukwedeya & Mudhara, 2023). A study regarding the factors that determine rural livelihoods diversification approaches among Chewaka re-settlers communities in southwestern Ethiopia reveals that agriculture (43.4%) plus non-farm (25.5%), agriculture plus off-farm (19.3%) and a combination of agriculture plus non-farm plus off-farm (12%) activities are the most pertinent livelihood strategies in the study area (Abera *et al.* 2021). Another study on livelihood vulnerabilities, contributing variables and coping mechanisms related to rural livelihoods in Tukusha Woreda, North Western Ethiopia shows that livelihood strategies in the area of study comprises of producing sesamen, cotton, barley and different cereal crops (Mengistu, 2022). This scholar indicates that in Woreda, different cash crops were raised to improve market prospects

create better market opportunities. From these studies, it is clear that agriculture alone cannot be regarded as the reliable source of livelihood for rural households in Ethiopia.

In as much Ethiopia seems to have various livelihood strategies for rural households, there is a sense in which the scarcity of water impacts the means of subsistence for rural inhabitants. For example, a study on climate variability and climate change impact on rural source of revenue and adaptation strategies in Southern Ethiopia points to most rural people in Ethiopia depending on rain-fed agriculture that is sensitive to the climate (Araro *et al.*, 2020). A study in Ethiopia discloses that rural households depend on agriculture and other non-agricultural strategies for their livelihoods (Ketema, *et al.*, 2021). Water scarcity exacerbated by climate change hinders subsistence farmers to grow enough food for the families (Mekonnen *et al.*, 2021).

The Southern African Development Community (SADC) has enforced various policies and strategies to encourage sustainable livelihoods and food availability in the region (Mapiye *et al.*, 2020). Livelihood strategies in Botswana are inclusive of diverse options beyond agriculture, with the purpose of reducing poverty. These strategies consider eco-tourism, veldt products and sustainable livelihood approaches emancipating communities to support their advancements. Research on utilising forest resources and supporting rural lives in Chobe enclave, Botswana reveals that forests are vital for providing household energy requirements, construction materials, agricultural inputs and dietary needs (Thakadu *et al.*, 2020). The study further indicates that 75% of the inhabitants indicated their dependence on forests for their means of survival. Livestock farming is another important livelihood for rural people as part of a range of livelihood strategies in Botswana (Molosi- France, 2020).

Studies show that water scarcity inflicts critical challenges to rural livelihoods in Botswana. For example, a study on resettling smallholder farming systems for climate change resilience across

Botswana arid zones shows farmers' barriers to production being water shortage intensified by drought (Batisani *et al.*, 2020). Another study shows that droughts are major shocking natural disasters disturbing the production of food, water properties, and causing widespread human and animal mortalities (Lottering *et al.*, 2021).

In Lesotho, livelihood strategies are primarily focused on agricultural intensification, livestock farming and livelihood diversification (Lekhooa, 2021). Agriculture is a crucial means of support for the greater population of rural areas, despite contributing only 6% to the national GDP (World Bank 2018). The report further states that the agricultural landscape is characterised by rain-fed subsistence farming, with some irrigation on 2,637 hectares of land. However, water availability is a concern, with prolonged spells affecting crops and plants despite the country's abundant water resources. The country's agricultural sector faces challenges such as erratic rainfall, droughts, and rugged topography. These conditions affect farmer's ability to produce crops, leading to food insecurity and reduced livelihood opportunities in the rural areas of Lesotho.

People in rural Lesotho also engage in off-farm livelihood activities. Research on non-farm subdivision in rural development in Lesotho indicates that non-agricultural activities are a source of livelihoods for rural Basotho, as subsistence farming has failed to meet satisfactory incomes (Rantso, 2016). This scholar maintains that these activities include small businesses, crafts, and casual labor. Additionally, Rantso cautions that diversifying into non-farm activities assists the rural households to cope with poverty and food security.

Livelihood diversification in Lesotho is a critical strategy for rural households to improve the standards of living and reduce the vulnerability. Artisanal diamond mining is one of the livelihood strategies for rural households, contributing to poverty alleviation and providing an alternative source of income (Makhetha, 2017). Water scarcity impacts livelihoods diversification in Lesotho,

with an estimation of 300 000 households depending on agriculture, fishery, and livestock watering activities (Nyaka, 2021).

Based on this review, there is need for more and in-depth research centered on specific impact of water quality and access on the sustainability of rural livelihoods. Present studies emphasize the value of water in attaining equitable, sustainable, and productive rural economies (Development International, 2022). There is need for further research on how women are specifically affected by the scarcity of water. This study therefore intends to add new knowledge on the livelihoods opportunities for rural women and how they are impacted by the scarcity of water. .

### **2.3 Water and gender**

Women and girls around the globe are often burdened with responsibilities like water fetching, leading to health issues and limiting their economic opportunities. A study on the bearing of drought on the well-being and livelihood of females and teenagers in India shows that the struggle to access clean water in rural areas leads to physical strain, musculoskeletal problems and chronic pain due to carrying heavy water containers over long distances in challenging terrains (Algur *et al.*, 2021; Temberge *et al.*, 2021). On the other hand, research on water crisis in India discloses that in some regions, men have burdened women on the responsibility of ensuring water availability and management, resulting in practices like polygamy for water collection, labeled “water wives” (Behal and Behal, 2021). In addition, the introduction of “water mafia” exploits the scarcity of water, with men engaging in selling water for profit, further intensifying the crisis in India (Kumar *et al.*, 2020).

In Africa, water scarcity disproportionately affects women and girls due to their traditional roles in society (Chigusiwa *et al.*, 2023). Research on gendered experiences of water scarcity in Ghana indicates that deficient water supply for daily household duties is related to physical violence, with



women being vulnerable to violence, rape, and forced marriages due to their obligation for fetching water during crisis (Nordstrom & Widman, 2022). Ghanaian men are also affected by the scarcity of water, although women bear a disproportionate burden (Abass, 2020; Nordstrom & Widman, 2022). The incidence of water scarcity in Ghana has resulted in rural people having to purchase water from expensive informal sources, which have hindered men to participate in revenue creating events that are largely dependent on water (Nordstrom & Widman, 2022). Therefore, restricted agricultural opportunities exacerbated by the scarcity of water has forced young men to migrate out of rural areas of Ghana in hunt for better occupation in cities (International Water Management Institute (IWMI), 2020).

In SADC region, the scarcity of water has impacted on health of rural communities. Lack of access to clean water results in women experiencing a plethora of health difficulties including waterborne diseases, which can lead to death (Getts, 2018). A study on water, sanitation and health in Malawi indicates that lack of access to clean water and sanitation facilities can lead to hygiene related diseases, such as scabies, particularly among girls and women who require frequent baths (Akpabio, 2021). At the same time, the scarcity of water has resulted in men experiencing health problems. For example, a study on water scarcity and health reveals that men in Malawi experience diarrheal diseases like cholera (Livingston, 2021). This scholar further shows that men are also vulnerable to waterborne parasites and diseases like schistosomiasis, typhoid fever, and hepatitis, posing serious risks.

Water scarcity in Lesotho disproportionately affects women, who are often responsible for collecting water (UNHRSP, 2019). The lack or inadequate water infrastructure, together with the drying of water springs has increased the burden on women, who must walk longer distances and rely on lower quality water (FAO, 2021) exposing them to risks of attack and rape (UNHRSP,

2019). Equally, a study on community perceptions of the social impact of the Metolong Dam and reservoir in Lesotho indicates that men often have to travel longer distances to fetch water, consuming time for other economic activities (Sekamane *et al.*, 2023).

The time spent on water collection in Lesotho often comes at the expense of educational and economic opportunities for women and girls and increases their vulnerability to sexual violence (Mondlane, 2023). The scholar indicates that the construction of water storage tanks in vulnerable areas of Lesotho has helped alleviate the work burden on women, increased crop production and provided opportunities for income generating and skills development. However, women's representation in water, sanitation and hygiene workforce remains minimal, indicating a need for gender sensitive approaches in policy and conclusion procedures related to water resources (Gomez *et al.*, 2019).

. While research often examines the gendered impacts of water scarcity on rural livelihoods, thus, focusing generally on both men and women, little is known about how the scarcity of water impacts specific gender. This research thus intends to fill in the gap by assessing the impact of water scarcity on women and girls in Lesotho rural areas.

#### **2.4 Water Management and Rural Livelihoods**

The incidence of water scarcity has become a major concern that impacts people in different parts of the world. As a result, addressing water scarcity has become progressively pressing (Padder & Bashir, 2023). In addition, water scarcity has appeared as a major obstacle to economic advancement, leading to intense competition among diverse areas dependent on limited water resources (Perez, 2020). Governments have instigated numerous policies and programs aimed at addressing the incidence of water scarcity. For example, the government of India has implemented various strategies meant to address water scarcity, recognising the urgency due to India's high

population and limited water resources (India Water Portal, 2023). To tackle water scarcity, the government has launched schemes like the Jal Shakti Abhiyan (JSA), a movement for water recharge and rain water-stressed districts, now covering 740 districts in the country (Mohan, 2023). Additionally, the government continues to work on water governance, law, policy and administration to improve water management and address water scarcity (Ahmed & Araral, 2019).

The introduction of different schemes and programs in India have made a significant contribution on the livelihoods of people in India. One important point to note is the success of the Jal Shkti Abhiyan (JSA) on the livelihoods of people in India, the JSA has made the accessibility and availability of water for agricultural purposes, supporting agricultural activities for rural people (Ministry of Jal Shakti, 2020). The ministry also adds that the participatory approach has contributed to emancipation of stakeholders and assists in ensuring sustainability of water conservation efforts, thereby benefiting rural livelihoods.

In order to redress the condition of water scarcity in the rural areas of Africa, some countries introduced the water conservation policies. In Libya, traditional water management practices such as rainwater collection and gravity- based ground water systems also provide alternative to large-scale water infrastructure, allowing individual households and communities to contribute to water conservation efforts (Chibani, 2022). In addition, the United Nations Sustainable Development Cooperation Framework for 2023-2025 prioritises preventing, mitigating, adapting, and responding to the waves of climate change and environmental degradation, as well as tackling water scarcity (UN Climate Change Sheet, 2022).

The traditional water administration practices have had a critical impact on the livelihoods of people in rural Libya. These practices have resulted in increased production in agriculture, higher incomes, generation of employment opportunities, and improvements in social services and

infrastructure (Argaw *et al.*, 2023). The scholars argue that the execution of watershed management development practices resulted in enhanced natural and social capital for improved efficiency, income generation within the rural areas of Libya.

Some countries often resort to the Integrated Water Management (IWM) as a rounded approach that considers the inter-connectedness of water resources, ecosystem and human needs. Several studies in Ghana have reflected on how IWM strategies have successfully mitigated water scarcity in rural areas (Sarpong & Mensah, 2018). The study emphasises the importance of stakeholder engagement, adaptive management and innovative solutions tailored to local conditions. Researchers use modeling and simulation techniques to measure the potential influence of IWM strategies on water obtainability, quality and ecosystem health. These studies provide valuable insights into the long-term effectiveness of different management approaches under various scenarios (Kim *et al.*, 2020).

The IWM had a valuable contribution on the livelihoods of people in Ghana. In accordance with a study assessing the influences of better-quality water supply on rural livelihoods in two communities in the Upper East Region, Ghana, the availability of improved water supply has resulted in the positive impacts on well-being, sanitation, time-saving, yield, food supply and nutrition, limited stress on people, especially women (Abayie, 2023). The study discovered a strong relationship between household revenue and the availability of improved water, indicating that access to improved water is important for enhancing livelihoods.

Investment in water infrastructure is key to ensuring sustainable access and availability of water. Construction or improvement of water sources infrastructure such as wells, boreholes, and piped water systems can provide rural communities with reliable access to water. For instance, a study by the World Bank found that investing in piped water systems in rural areas of developing

countries significantly increased access to safe water sources (World Bank, 2020). Constructing water storage facilities such as reservoirs and small – scale dams can help mitigate water scarcity by storing water during periods for use during dry seasons. In Tanzania, the government has invested in the construction of small- scale dams to improve the availability of water in rural communities (International Water Management, 2018).

The construction of dams in the rural areas of Tanzania has contributed in improved rural livelihoods. These dams play an important role in ensuring water security, irrigation, and supporting agriculture and livestock as seen in the importance of farm dams for small-scale agriculture (Theodory, 2023). A study in Iringa region found that solar-powered water pumps provided by the Elico Foundation NGO have benefitted small-scale farmers. The solar pumps tripled production by expanding irrigated areas from three to ten acres at the same time reducing the expenses. Water management in rural areas of Lesotho is primarily governed by the Water Act of 2008, which provides for the management, protection, conservation, development, and sustainable utilization of water resources (Water Act, 2008). The act outlines the fees for water use permits, with different rates for various types of consumptive and non- consumptive uses, such as domestic, irrigation, industry, water bottling, mining, hydropower, recreation and navigation.

Projects like the Rural Water Supply and Sanitation, funded by the Government of Lesotho and implemented by the Department of Rural Water Supply, aim to improve health and livelihoods of Basotho living in rural areas through increased and sustained domestic water supply access to improved domestic water supply, latrines, and hygiene practices (Water Act, 2008). The Metolong dam and Water Supply Program, funded by the World Bank and other partners, has enhanced lives at the grass-root levels in Lesotho by bringing water to the country’s lowlands, boosting the

economy, improving the living standards in rural areas and providing employment opportunities, capacity building and skills development (World Bank, 2020).

While there are numerous examples of successful infrastructure projects addressing water scarcity in rural areas, there is often limited research on the effectiveness of these projects over time, particularly in terms of their ability to continue providing reliable water access in the face of changing environmental conditions, population growth and economic factors. This study therefore intends to assess the effectiveness on government interventions in addressing water scarcity,

## **2.5 Chapter Summary**

The chapter reviewed the livelihood strategies for rural households in different regions and a common observation from this review is that dissimilar regions depend on various livelihood strategies for their sustenance. Some scholars have confirmed that in most developing countries, rural households depend on agriculture as a dominant source of livelihood. However, reviewed literature indicated that agriculture in rural areas is impacted by the scarcity of water, forcing rural households to diversify their livelihoods, and in doing so, rural people often opt for non-farm and off-farm activities to compliment agricultural deficit.

Additionally, analysed studies indicate that gender roles in most rural areas of developing countries, have led to women ensuring the availability of water. The scarcity of water, according to reviewed literature results in women walking long distances to water sources, exposing their vulnerability to attack, rape, and other forms of abuse. On the other hand, researched works suggest that men's responsibilities include ensuring availability of food in the family. In an effort to make a living out of agriculture, men's experience with water scarcity leads to low production of food, making the family vulnerable to poverty.

Lastly, previous studies established that the incidence of water scarcity is a barrier to economic freedom for most rural areas of different countries. This poses the need for the development of responsive policies to ensure the accessibility of water in most developing countries. Further, studied works reveal that approaches for water management can be seen as a way out of the scarcity of water. For example, reviewed academic works indicate that the community based water management approach emphasizes the role of the community in bringing local solutions to water problems. The next chapter deals with the research methodology.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1. Introduction**

This chapter explored the research methodology. Napitupulu *et al.* (2019) define research methodology as the study of methods, designed to resolve the research problem. On the other hand, Tiwari and Dwivedi (2023) define research methodology as involving a thorough examination of the procedures used in the line of enquiry to guarantee that the results are legitimate, trustworthy, and believable. Thus, research methodology is an organized, reasonable strategy that outlines the practices and measures used to gather, evaluate, and understand data in order to address research problem or questions

The first section is the area of study, which gives a precise description of the geographical area of the study. The study proceeds with the research approach and design, study population and sampling procedure. These sections justify the methods used to conduct the study and describe the plan for the study, which is phenomenological design. Furthermore, data collection methods and procedure, ethical considerations and data analysis are highlighted in this chapter.

### **3.2 Area of Study**

The area of study is Majapereng Electoral Division. Majapereng Electoral Division consists of eight villages namely, Ha- Khitsane, Ha- Mokhethi, Ha- Ramoitoi, Pontseng, Majapereng, Thabaneng, Ha- Keeke and Lipeleng. Although there is a diversity of water sources in Majapereng Electoral Division which include wells, boreholes and taps, access to water is however insufficient and does not meet the demands of people. A general observation is that women within Majapereng Electoral Division bear the responsibility of ensuring the availability of water and as result, engaging in income generating activities is a problem that confronts them. The incidence of water scarcity is exacerbated by unreliable precipitation poor and low cost technology for water needs.



The last study conducted in Majapereng Electoral Division in 2004 revealed that each village had about two hundred households (Mokhatla, 2004). However, the 2016 population census indicated that the overall population for the above villages was one thousand one hundred and ninety- seven (1197) from three hundred and forty-six (346) households (Bureau of Statistics (BOS,) 2016). These villages are positioned in the desiccated South Western lowlands of the country directly below Qhalasi and Qhalasana mountains.

Ha- Khits'ane and Majapereng are located adjacent to Makhalleng river on the east while the three (Ha- Ramoitoi, Pons'eng and Boikano) are located in proximity to Kolo-la-pere river. These villages are featured by weakening grazing land, low unpredictable precipitation and recurrent droughts. Factors described herein seemingly impose a risk to the sustainability of livelihoods. The researcher observed that each village has more than two hundred villagers with more people living in houses of moderate to poor standard. Finally, Boikano and Ha- Khits'ane are the only villages that have social infrastructure. For instance, they both have primary schools (Mokhatla, 2004).

### **3.3 Research Approach**

This study used the qualitative research approach. This approach is explained the study of the nature of occurrences, which comprises their value, diverse setting in which they appear or the standpoints from which they can be observed, but ignores their range, regularity, and place in an objectively determined chain of cause and events (Chinyere & Val, 2023). Additionally, Islam and Aldaihani (2022) also define the qualitative research approach as the method of inquiry that permits one to discover or examine the quality of associations, activities, circumstances, or materials. Qualitative research approach is therefore a technique of investigation that discovers and offers deeper insights into the nature of problems focusing on reasons and experiences of human behavior.

Qualitative research approach was the best choice for the researcher because at its core, asked open-ended questions whose answers were not easily put into numbers such as how and why (Cleland 2017; Islam and Aldaihani, 2022). Data on how the incidence of water scarcity affects women's rural livelihoods is not numeric and therefore, the qualitative research approach is the best choice for this study. Islam and Aldaihani (2022) argue that getting answers to those 'how' and 'why' or any 'why-questions' are essential and practical because those responses can spread the current knowledge, enrich existing literature, and further develop our understanding. This means that the researcher was able to understand the experiences and opinions of women in Majapereng Electoral Division in relation to the scarcity of water. The incidence of water scarcity is a social phenomenon, and therefore, in order to gain a deeper understanding of the incidence; a qualitative research approach was the best choice. The approach was an appropriate choice for this study as data collected were the views of participants and were free from the researcher's influence. The application of the qualitative research approach made it easy to discover women's experiences and challenges in relation to water scarcity.

### **3.4 Research Design**

The study followed a phenomenological research design. Phenomenology is a method to investigation that seeks to describe the essence of a phenomenon by exploring it from the way people are experiencing it (Neubauer *et al.* 2019, Alhazmi & Kaufmann, 2022). This means that phenomenology is an effort to establish the link between the participants and issues that confront them.

Phenomenology as a research design fitted well with this study as an examination into women's lived experiences, what their livelihood strategies were and how their livelihoods were impacted was considered. The relationship between women and the scarcity of water and how it impacts

their livelihoods was the major concern for the study and considering phenomenology as a research design made it a relevant choice.

The case study research design was also used in this study. It is defined as an in-depth study of one person, group or event (Cherry, 2024). The case study design includes detailed and intensive analysis of a particular event, situation, organization or a social unit (Schoch, 2020). The case study was the best choice for this study because of its ability to provide in-depth experiences and challenges faced by women in Majapereng Electoral Division. The case study helped researcher to focus the study within the confines of space and time on a specific case.

### **3.5 Study Population**

The population for this study was people residing within Majapereng Electoral Division. Population, also called an extensive / large collection of objects or individuals (participants or respondents) that is the central focus of a research investigation or query (Islam and Aldaihani, 2022). Majapereng Electoral Division is made up of eight villages but the researcher chose only four (4) villages namely Majapereng, Ha- Ramoitoi, Boikano and Pontseng because these villages experienced the worst incidence of water scarcity. Women residing within Majapereng Electoral Division participated in this study. Village chiefs and the councilor also formed part of this study. Furthermore, the government, through the Department of Rural Water Supply was also part of the interviewees in this study.

### **3.6 Sampling Procedure**

The study has adopted purposive sampling. Purposive sampling is a non-random sampling method. Purposive sampling, also termed judgement sampling is a sample, which is typical of the population in relation to characteristics under study (Muzari *et al.* 2022). Purposive sampling involves thoughtful collection of information- rich units or cases on the basis that they permit the

researcher to acquire as much as possible the phenomenon of interest (Tom *et al.* 2016). For the best interest of this study, women were purposively sampled because they were responsible for fetching water and therefore were fully aware of the challenges and experiences confronting them. The Department of Rural Water Supply was purposively sampled because it was responsible for water supply and sanitation infrastructure development and service delivery in the rural areas and therefore had information related to water provision. Councilor was chosen because of their mandate to ensure that the needs of people, such as water needs, are met hence their inclusion in this study. Village Chiefs were selected because of their instrumental role for mobilizing communities, advocating for sustainable water management practices and ensuring that the voices of rural women are heard in decision-making processes related to water resources and livelihood improvement.

### **3.7 Data collection Methods**

This study integrated interviews, focus groups discussions and questionnaires as part of its data collection methods. Data collection is the gathering and manufacturing of verbal (or visual) resources for scrutinizing and understanding phenomena, social fields, subjective and collective experiences and the related meaning making process (Flick, 2017).

#### **3.7.1 Interviews**

Interviews involve the collection of data through dialogues between a researcher (interviewer) and his/her respondents (Mwita, 2022). Mwita further states that interviews may be conducted face-to-face or through technological means such as telephone or video conferencing. In this study, the researcher conducted face-to-face interviews. The interviews were unstructured to allow the participants the freedom to express themselves without limit. A total of eight (8) key informants were engaged through the interviews and these were village chiefs, councilor and the Department of Rural Water Supply. Information relating to how the scarcity of water affected women's

livelihoods was solicited from the village chiefs and the councilor. Furthermore, officials in the Department of Rural Water Supply provided information relating to government interventions aimed at addressing the incidence of water scarcity.

**Table 3.1: Sample Characteristics**

<b>Target population</b>	<b>Stratum</b>	<b>Sampling type</b>	<b>Participant (s)</b>
Village Chiefs	Key Informant	Purposive	4
Councilor	Key informant	Purposive	1
Rural Water Supply Personnel	Key informant	Purposive	3
<b>Total sample</b>			8

### **3.7.2 Focus group discussions**

The searcher decided to formulate seven (7) focus group discussions of ten women in each of the five villages. In focus group discussions, the researcher builds one or more convenient clusters to collect data through dialogues (Mwita, 2022). The researcher chairs and controls the discussions within a group and decides who has to speak and when to speak. Tawycross (2018) recommends each group to have a minimum of six participants and maximum of twelve participants. In focus group discussions, the researcher intended to make a selection based on women experiences with extreme experiences of water scarcity. The most affected group was selected including senior citizens within Majapereng Electoral Division.

### **3.7.3 Questionnaires**

This study used open-ended questionnaires. Questionnaires are either close- ended or open- ended (Mwita, 2022). Open- ended questionnaires cover questions that permit a respondent to write his/ her response without being restricted in giving responses (Allen, 2017). Mwita (2022) argues that

questionnaires offer flexibility on the side of the respondents to express feelings and opinions on the particular question asked or a statement. This means that respondents freely provided their opinions when data collection was carried out in this manner, making questionnaires the best method of data collection for this study. A total of ten (10) questionnaires were administered to women experiencing the worst incidence of water scarcity and then collected at an agreed time. Information on how the scarcity of water affected rural livelihoods and interventions used to address the incidence of water scarcity was requested from participants. The questionnaires were designed to allow participants to express their opinions, experiences and narratives. The researcher also provided instructions and guidance for filling the questionnaire along with the contacts for assistance. Again, the questionnaire was brief enough to maintain the interest of the participants at the same time conserving the necessary information.

### **3.8 Data Collection Procedure**

Data collection procedure involved the style of involving the participants and gaining access to the field as well as collecting the data. Data collection procedure refers to the systematic fashion in which data is gathered and measured to enable researchers to respond to precise research questions, test hypotheses and evaluate the outcomes (Sake, 2021). Data collection procedure is simply about the logical steps to be followed in order to gather data. In order to have full data on the feminine impact of water scarcity on rural livelihoods, the researcher follows the procedures discussed below.

The researcher gained access to the field through presentation of letter of request from the National University of Lesotho. The researcher already understood the setting, its culture and stakeholders. Spend time observing the environment and talking to informed participants about the setting as Berch (2023) advises. The researcher located individuals who could grant access to relevant

authorities within Majapereng Electoral Division. The researcher communicated with relevant authority and pledged to treat data with highest privacy.

The researcher prepared the interview question well in advance. The type of participants were women who were in their productive age. The researcher also prepared interview guide that included key questions and discussion points for the study

### **3.9 Ethical Considerations**

The researcher pledged to uphold to and consider the issues of voluntary participation, informed consent, anonymity, confidentiality, potential harm.

#### **3.9.1 Voluntary participation**

The researcher ensured there was free participation of respondents in this study during the collection data. Voluntary participation in research is a basic ethical principle that ensures individuals have freedom to choose whether to participate in a study without feeling pressurized or forced (Xu, *et al.*, 2020). Participants were also at liberty to withdraw from, or leave the study any point without feeling a compulsion to continue. The researcher guaranteed that participants do not need to provide reason for leaving the study. The researcher also ensured the absence of negative consequences to their refusal to participate in research.

#### **3.9.2 Informed Consent**

The researcher provided information related to the study so that participants were aware of the value of contributing in this research. Informed consent refers to a situation in which all participants receive and understand all the information they need to decide whether they want to participate (Bhandari, 2023). The researcher made necessary information related to the study available to participants so that they decided whether they contribute in this study or not.

### **3.9.3 Anonymity**

The researcher ensured that anonymity of participants. This research aimed to understand real-life phenomena, studying people's livelihoods and how they were impacted by water scarcity, therefore, anonymity had to be practiced to avoid easy identification of participants which would put them at risk. It is essential that the researcher maintains anonymity through avoidance of using the participants' names or an identity that can lead to their recognition by any other persons besides the researcher (Muzari *et al.*, 2022). In order to ensure anonymity, the researcher will utilize data pseudonymisation, an alternative method where information about participants is replaced with fake identifiers (Bhandari, 2023).

### **3.9.4 Confidentiality**

The researcher intended to treat entire information provided by participants with utmost confidentiality. Any information relating to the private sphere of a person that they wish not be shared with others is considered confidential (Bos, 2020). All the information relating to the participants was treated with confidentiality. This information included the participants' geographical information and all the necessary data required by the researcher. The researcher treated information gathered or shared by participants with respect and did not violate the interests of the participants.

### **3.9.5 Potential for harm**

The researcher did not subject participants to psychological, social, physical and legal harm. In fact, the researcher pleaded to mitigate every possible source of harm in the study. The researcher provided privacy by protecting and providing dignity and respect views and perspectives of respondents. Potential harm, termed "non-maleficence" by some scholars (Cencten, 2021), requires refraining from behaviors and attitudes that may be harmful to others. The researcher abided by the principle of non-maleficence in order to protect participants from potential harm.



### **3.10 Limitations of the study**

The researcher encountered a challenge where the chief instructed the researcher to use the focus group discussions only and not questionnaires as had been agreed on. This denied the respondents the opportunity to individually express their feelings regarding water scarcity. This being the case, the researcher devised a plan to have seven focus group discussions to gather more data on the subject matter. This allowed the inclusion of more participants from various backgrounds, leading to a richer understanding of the study. Using many focus group discussions also helped the researcher to reach the point of saturation where no new themes and insights emerge.

### **3.11 Data Analysis**

Thematic analysis was used for the analysis of data in this study. This included interpretation, identification, and examination of patterns and themes in written data and regulates how these themes and patterns assist in understanding the subject matter or phenomenon in a detailed way for answering the research questions at hand (Islam and Aldaihani, 2022). Themes are a response to research questions. In order to achieve efficiently the process of data analysis, the researcher has adopted Dawson (2019) model of analysis. The model included familiarizing with collected data, developing codes, searching for themes based on based on initial coding, review of themes, theme definition and labelling and lastly report writing (Dawson, 2019)

### **3.12 Chapter Summary**

This chapter dealt with a comprehensive methodology and procedures relating to the study. The research methodology and procedure related to this study covered the research approach, research design, study population, sampling procedure, data collection methods, data collection procedure. Ethical considerations and data analysis were discussed in this chapter. The next chapter focuses on data presentation, analysis/ interpretation and findings of the study.

## **CHAPTER FOUR: DATA PRESENTATION, ANALYSIS AND DISCUSSION**

### **4.1. Introduction**

This chapter is on data presentation, analysis and discussion. It presents the findings acquired through the questionnaires, focus group discussions and interviews. Data has been analysed using thematic analysis, thus, patterns and trends discovered in obtained research responses were reviewed to create themes used in presenting this data. This has been done to make better and coherent outline of the analysis, equally, simplifying the most related responses in answering the main research questions guiding the research.

The first section) presents the results based on the condition of water scarcity in the area of study. The second section addresses the first objective where the study investigated the livelihood strategies for rural women within Majapereng Electoral Division. The subsequent section addresses the second objective on how the incidence of water scarcity impacts livelihoods of rural women in the ED. The last section deals with the interventions meant to address the condition of water scarcity with special reference to policy implications.

### **4.2 Livelihood strategies for women in Majapereng Electoral Division**

This section focuses on livelihoods activities of women in Majapereng Electoral Division. Women in different villages were asked what their livelihood strategies were and they pointed that there are various ways in which they survive, however, majority of them highlighted their dependence on agriculture, livestock production, brewing traditional beer and domestic work.

#### **4.2.1. Agriculture**

Majority of women highlighted that their major source of livelihoods are keyhole gardens. Women have grown vegetables in keyhole gardens and also indicated that surplus produce is sometimes sold for cash to neighbors. Some women confirmed that they use plots and keyhole gardens as their main source vegetables. Water is one of the major requirements important for crops in various

stages of growth, from seeding to harvest. Therefore, water requirement for crops plays a very important role towards their growth and development. For the purpose of agriculture, women in Majapereng Electoral Division source water from their small dams each constructed within the yard. The availability of small dams makes agriculture as a livelihood for women a possibility.

With regards to the above, one woman had to say:

*I have constructed plots and a keyhole garden at the backyard for production of vegetables. From these plots and keyhole garden, fresh vegetables are accessible and available when the need to consume them arises. Sometimes I sell extra produce to families who do not have access vegetables. The keyhole gardens and plot have positively contributed to supporting my livelihood activities and there has been a noticeable decrease of family expenses when it comes to food (Extracted from a questionnaire at Majapereng Electoral Division, May, 2024)*

The results of this study show that women in Majapereng Electoral Division engage in agricultural activities for their livelihoods. Keyhole gardens are constructed in a manner that allows for moisture conservation. Therefore, this saves the already scarce water in Majapereng Electoral Division. The findings of this study also indicate that women have also constructed plots on which they grow and produce vegetables. The keyhole gardens make vegetable available year round, sustaining the livelihoods of women in Majapereng Electoral Division. Some other respondents highlighted their means of livelihood as dependent on growing cereal crops like maize, sorghum and beans out in the fields. Cereal crops are entirely dependent on rain for survival.

This study shares similar results with the study on the factors affecting food security of rural farmers in Lesotho which reveal that keyhole gardening contributes food security as the majority

of households (65.45%) never skipped a meal and were food secure (Muroyiwa & Tselisehang, 2021). The scholars further indicate that keyhole gardening is gradually gaining popularity at a global scale in both developing and developed countries due to unique benefits related to sustainable farming practices. The keyhole gardens stimulate food security since they improve food availability, produce revenue and assist in the reduction of food bills (Muroyiwa & Tselisehang, 2021). Another study on sustenance of agriculture as livelihood reveals that dams help provide reliable water sources for irrigation, especially during dry seasons and droughts (Latela, 2021). The author maintains that, by storing rainwater, small dams allow farmers to access water for their crops when other water sources may be scarce. Small dams are key to countering the scarcity of water.

With regard to the findings of the study, the livelihoods Capitals Framework portrays its relevance in the following way. Financial capital, according to Mattos (2015) includes the financial resources available to invest in community capacity building, underwrite business development, support civic and social entrepreneurship and accumulate wealth for future community development. Participation in agriculture requires skills and knowledge which is key to improving agricultural production. Tangible assets and infrastructure that support economic growth and development are referred to as physical Capital. Women in Majapereng Electoral Division have access to physical assets like watering cans and other assets such as land for the survival of their families. These assets are important for improving agricultural production for households. Frequent contact with the extension workers helps to boost farmers' human capital. Engaging in agricultural activities allows women in Majapereng Electoral Division to access income in the form of money from the sale of agricultural products. This enhances their financial capacity and independence.

Membership of Majapereng women farmers in social networks and groups enhance women's entrepreneurial and business capabilities in agriculture.

#### **4.2.2.1 Livestock Production**

Women in Majapereng Electoral Division highlighted their dependence on livestock rearing. In order for livestock to survive, they get most of their water from the Makhalleng River. Livestock require clean drinking water for growth, reproduction and overall health. Women highlighted that they do not only rear cattle for working the fields as a means of survival but also selling them in return for money. Some other women in Majapereng also indicated that they use their cattle for drawing water for domestic purposes and sometimes for supporting their livelihood activities. In a focus group discussion one woman is quoted saying:

*I make a living from rearing sheep, selling them as live animals and also generate income from selling wool every year. This is a steady source of my family's income that help cover my daily needs and improve my financial security. I have also achieved my economic independence and financial security. I use animals' droppings as manure which enhances soil fertility and reduces the need to buy expensive fertilizers from the market (Focus group discussion with women at Haramoitoi April, 2024).*

The study established that livestock production contributes a larger part of women's livelihoods in Majapereng Electoral Division. The only source of water for livestock in Majapereng is Makhalleng River and all livestock have to walk to such river to access water. According to the findings of the study, livestock production generates income for women in Majapereng Electoral Division in two ways. The first being that of selling animals to those in need of them. The second

includes selling their products. This comprises of selling wool, mohair, and meat for these animals. Livestock production contributes to the livelihoods of women in Majapereng Electoral Division.

Some scholars highlighted that livestock production is a form of livelihood activities for people in rural areas (Lekhooa, 2021, Zhang *et al.*, 2022, Molosi- France, 2020). This is supported by the findings of this study which reveal that majority of women in Majapereng Electoral Division depend on rearing of sheep, goats, and cattle as their livelihood activities. Women in Majapereng sell wool and mohair from sheep and goats respectively. Livestock selling is an income generating activity for families in Majapereng Electoral Division. These findings are consistent with a study on the contribution of livestock to household livelihoods in Tanzania and Uganda which indicate that non- tradable and marginally traded livestock output represent about half of the contribution of livestock to household livelihoods (Zane & Pica- Ciamarra, 2021).

Livelihoods Capitals framework as a theory guiding this study reflects its correspondence in that, livestock production generates income through the sale of either animals or by-products such as wool and mohair. The sale of livestock is vital for financial security of households in Majapereng Electoral Division. Based on the social capital, livestock production is often connected with social networks and community interactions, making this livelihood relevant to the livelihood capitals framework. Livestock production is reliant on the natural resources, such as land and water. These natural resources are vital for sustainability of these activities and contribute to natural capital. Natural capital amounts to having enough farmland and access to resources like land which enables farmers to engage in livestock production. Women in Majapereng Electoral Division participate in livestock production as a livelihood activity and this signifies their important contribution in the natural capital. Livestock production involves special skills and knowledge, which are handed

down through generations. Women in Majapereng Electoral Division participate in the proper management of livestock at the same time answerable for securing water for their households.

#### **4.2.3 Brewing traditional beer**

Some women within Majapereng Electoral Division have said that brewing traditional beer and selling is another way in which they make a living. Village men and women from the surrounding villages are customers to women selling traditional beer in Majapereng. Brewing traditional beer requires water- use in large quantities. Therefore, water is a major requirement to sustain this type of business. As a result, women participating in this form of livelihood get water from the wells, and solar powered community taps. However, water from the taps is sometimes unavailable and women have to walk long distances to water sources. In relation to the above, one woman had to say:

*Brewing traditional beer is a cultural practice that connects us to our heritage. With profits from the sale of traditional beer, I afford educational expenses for my children and other family needs. Selling traditional beer provides a steady source of income which helps in meeting daily needs and improving the overall financial stability in my family. This has also reduced my ability to rely on my children who work in the neighboring country for money and also assist in covering the household expenses and improve my financial stability. I am also able to buy seeds to support my agricultural activities. Through selling traditional beer, I have improved my networking abilities as some people in the neighboring villages often buy in larger quantities in times of their cultural events (Focus group discussion with women at Ha- Ramoitoi in April, 2024).*

The results of this study revealed the positive contribution of brewing traditional beer as a livelihood for women in Majapereng Electoral Division. The results indicate that some women engage in the brewing and selling of traditional beer as their livelihood activities. The sale of traditional beer, contributes to the livelihoods support in that, women engaged in selling traditional beer generate income from the sale of traditional beer. Income from the sale of beer is important for sustaining household's needs. Further, the findings of the study established that selling traditional beer has strengthened women's ties with the community

As the results of this study indicate that women are actively involved in brewing traditional beer as a livelihood activity in Majapereng Electoral Division, these results are consistent with the results of the study on exploring the prospect of traditional alcohol making as a sustainable rural livelihood in Nepal. The results indicate that alcohol making is a predominant economic activity in the village of Burunchuli that constitutes a major source of income for the villagers (Shrestha & Raj, 2021). The scholars indicate that the unavailability of economic opportunities, resources and low level of education both male and female are involved in alcohol making. Water is an important requirement in the process of brewing traditional beer as it is vital for malting, fermentation and overall production (Lawir *et al.*, 2022). Another study reveals that access to clean water enhances the quality of the beer and can improve the economic viability of brewing as a livelihood activity, fostering resilience among rural population (Sawadogo- Lingani *et al.*, 2021).

Brewing traditional beer as a livelihood of some women in Majapereng Electoral Division fits well with the livelihood Capitals Framework. Brewing of traditional beer as a livelihood of women also reflects its relevance on the human capital as part of the livelihood capitals framework. This is because brewing traditional beer requires some skills, techniques and knowledge that can be



passed from generation to generation. Brewing traditional beer also provides a means of income and social interaction, reflecting relevance on financial capital. Further, brewing traditional beer has a close relationship with social networks and community interaction, maintaining social capital as a result. Women in Majapereng Electoral Division engage in brewing traditional and it provides a means of financial support and income for families. Income from the sale of traditional beer is vital for financial capital and support for community advancement in Majapereng Electoral Division. Brewing traditional beer require physical infrastructure, such as fields and brewing equipment.

The social capital reflects on the connections among people and organizations or the social glue that makes things happen (Mattos, 2015). Agriculture, livestock production, and brewing traditional beer, all contribute to the livelihood capitals framework by supporting financial, human, social, physical, and natural capitals. These components are interconnected and essential for the well-being of individuals and communities within Majapereng Electoral Division. These livelihood activities contribute to the resilience and sustainability of rural livelihoods, integrating various forms of capitals to improve economic stability and community well-being in Majapereng Electoral Division.

### **4.3 Water scarcity and its impact on the livelihoods of women in Majapereng Electoral Division**

This section will concentrate on how the incidence of water scarcity impacts the livelihoods of women in Majapereng Electoral Division. However, it will first present the water sources available in Majapereng Electoral Division in order to put into perspective, the condition of water in the community.

### **4.3.1 Water Sources and their sustainability in Majapereng Electoral Division**

This sub-section presents the findings related to the state of water scarcity in Majapereng Electoral Division. The women in Majapereng mentioned the available water sources in the community namely boreholes, solar powered community tap and wells as discussed below.

#### **4.3.1.1 Boreholes**

The findings of this study indicate that women in Boikano village source water from a borehole. According to the results of the study, the borehole belongs to the primary school located within the village and this means that the community shares this facility with the primary school. This study reveals that a borehole from the local primary school is the only reliable source of water for households in Boikano.

In relation to water sources available in Boikano, one woman has to say;

*We get water from the neighboring village, Ha -Mokhesi. Water from Ha- Mokhesi does not accommodate the villagers. As a result, we are supported by borehole water from Kolo-la-pere Primary School (focus group discussion with women, in Boikano in May, 2024).*

Boreholes have the capacity to boost water access by providing a low cost drinking water alternative for communities in middle and low income countries (Martinez- Santos *et al.*, 2020). The findings also point that water from the nearby village does not fully satisfy the needs of families in Boikano hence the school's borehole made an alternative. The findings of this study are consistent with the study on the analysis of borehole water accessibility in Samaru Community, Zaria Metropolis, Nigeria which found that hand pump borehole was the major source of water supply in the study area with 71% (Muhammed *et al.*, 2021).

The findings of this study fit well with the findings which indicate the declining water availability in boreholes (Murigi, 2024). The scholars indicate that drought conditions further exacerbate this issue, reducing recharge rates and lowering ground water ground water levels, particularly in areas like Nairobi. Additionally, the scholar highlights that climate change is altering the precipitation patterns, increasing evaporation and affecting borehole yields (Murigi, 2024).

#### **4.3.1.2 Solar powered taps**

The results of this study indicate that water is sourced from the solar powered community taps. The taps are complimented by the two wells available for women's access to water. The findings of this study also unpacks that women from Boikano get water from the nearby village through piped water taps. On as much as the Department of Rural Water Supply is aware of the water sources available in Majapereng ED, the findings of this study reveal that the department does not have the information regarding the current condition of water scarcity. In relation to the above, one woman had to say:

*We source water from the solar powered community tap. However, water from the taps is not reliable as the wind has blown solar panels and sometimes water is unavailable at the taps. As a result, we have to travel long distances in the terrains to get water from the wells. The wells are not protected sometimes animals drink water from these uncovered wells. We therefore have to wait for some time for water to collect in wells. The state of water is unsatisfactory in our village (Focus group discussion with women at Ha- Ramoitoi in April, 2024).*

In an interview with an official at the Department of Rural Water Supply, on the question of whether the department is aware of the different water sources in Majapereng Electoral Division, an official in the department is quoted saying:

*Our department is fully aware that communities in Majapereng Electoral Division depend on solar powered community taps, and wells as their main source of water. However, the department does not have information relating to the current condition of water in Majapereng Electoral Division. (Interview with Department of Rural Water supply official in April, 2024).*

The findings of this study are consistent with the results of the study on developing sustainable water supply system for rural South African communities. The results of the study indicate that the boreholes are sustainable sources of water in rural areas (Ngema *et al.*, 2024). The scholars further indicate that inadequate access to reliable and safe water hinder sustainable development. However, according to the findings of the same study, water supply in rural areas is affected by lack of resources, lack of funding, illegal connection, political instability, poor operation and maintenance, lack of capacity and skills.

#### **4.3.1.3 Wells**

The study established that, women in Majapereng Electoral Division use wells as sources of water. Women confirmed that they have to walk long distances to water sources because the solar powered taps are not reliable. In relation to the above, one woman had to say:

*In instances where water is unavailable in community taps, wells are our alternative, reliable sources of water. We have to travel long distances, in the terrains to the wells. Here in Majapereng village, we use the two wells namely, Makomane and Ha- Pitso as our alternative source of water (An extract from a questionnaire in Majapereng, May, 2024).*

Wells play an important role in the provision of access to clean water and enhance resilience in environmental challenges. In as much as women travel longer distances to the wells in Majapereng Electoral Division, they are able to access water from the two wells. However, traveling long distances to water sources in Majapereng Electoral Division is time-consuming and hinders women's participation in either economic activities or domestic work.

The findings of this study share similar results with a study on multiple water source use in rural areas. The findings revealed that water wells act as reliable water sources for rural communities (Sharma *et al.*, 2022). Another study on rainwater harvesting reveals that dug wells are the most used source of portable water supply in the village of Mvog-Betsi, Yaounde- Cameroon (Ako *et al.* 2022). From these results, wells play an important role in the provision of water for rural areas.

#### **4.3.2 Water Scarcity and its impact on women's livelihoods in Majapereng Electoral Division**

The findings revealed how water scarcity affects women's livelihoods differently. This section presents findings related to how water scarcity impacts on the livelihoods of women in Majapereng Electoral Division. The findings focus on water-related livelihoods such as agriculture, livestock production and brewing traditional beer. The effects are discussed in the subsequent sections below.

##### **4.3.2.1 Water scarcity and women agriculture**

The study has found that the scarcity of water impacts directly on agriculture as a livelihood for women in Majapereng Electoral Division. Lack of water affects agricultural activities for women in Majapereng Electoral Division as the unavailability of water impacts on agricultural production. The findings of the study revealed that having to travel long distances to water sources consumes their time for concentrating on their agricultural activities and other income-generating activities.

Due to lack of water, the findings reveal that the crops wild away, causing a decline in production and interfering with livelihoods of women. One women complained that;

*Crops suffer due to lack of water and ultimately wild away. This has caused a decline in production rate as compared to the past when water was available. Prolonged droughts have also contributed to the scarcity of water which has affected production as well (Extracted from a questionnaire at Majapereng in May, 2024).*

In an interview with the community leader on the effect of water on agriculture, the leader had to say;

*Our crop yields have been reduced as a result of water scarcity, degrading soil quality and threatening our food security. This crisis not affect the livelihood of women, but also poses a significant economic challenges for our community. It is important that we adopt sustainable water management practice and collectively towards ensuring equitable water distribution securing a better future for all (Interview with community leader at Majapereng, May, 2024).*

With regards to the livelihoods women had to abandon, the study's findings established that women had to abandon their livelihoods as a result of the scarcity of water in Majapereng Electoral Division. Of specific emphasis is the fact that majority of water- related livelihoods were abandoned. In relation to the above findings, a woman in a focus group discussion had to say:

*We had to abandon some of our livelihoods because the severe water scarcity made it impossible to sustain our agricultural activities and other water- dependent jobs. With insufficient water, crops failed, livestock suffered and our overall economic*

*stability was jeopardized. The situation forced us to seek alternative means of survival (Focus group discussion with women at Ha- Ramoitoi in April, 2024).*

The results of this study point that women in Majapereng Electoral Division have experienced a decline in term of the production of field crops such as maize. The results also reveal that some women have abandoned their fields due to continuous drought that has hit Majapereng Electoral Division. Related to the above is a quotation of a woman who had to say:

*There has been a decline in terms of agricultural production due to drought. The harvest has not been as expected in three consecutive years and this has been exacerbated by the scarcity of water (woman E was quoted from an interview in Majapereng village in April, 2024).*

The results of the study have established that the scarcity is more serious during the months of May, June and July. This has been confirmed by women, the councilor and community leaders. In addition, women from Majapereng village also alluded to the sentiments echoed by women from Ha- Ramoitoi. In an interview with the councilor and the community leaders, they have also confirmed the times of scarcity, adding that the water sources are mostly reliant on rain hence extreme scarcity during droughts. With regards to the above findings, one woman confirmed that:

*The condition of scarcity is more pronounced in winter season when we are experiencing limited amount of precipitation. During the months of May, June and July. Again, in times of draught, we do not get enough water, costing us to travel to the river for water (Woman G in a focus group discussion in Ha- Ramoitoi in April, 2024)*

The findings of the study established that the scarcity of water in Majapereng Electoral Division has resulted in crops suffering as a result of lack of water, causing a decline agricultural production. The scarcity of water experienced in Majapereng Electoral Division has been blamed on recurring drought that has hit the region so hard. According to the results of this study, soil fertility has deteriorated and food security is posed to vulnerability resulting from the scarcity of water. The findings also reveal that water scarcity has hampered economic development in Majapereng Electoral Division. The study revealed that the scarcity of water in Majapereng Electoral Division has hampered women's livelihood development, particularly agriculture. Further, results regarding water scarcity in Majapereng Electoral Division highlight the failure of crops, livestock suffering and economic stagnation which forced women to find other reliable sources of income within Majapereng Electoral Division. Women in Majapereng Electoral Division had to abandon some of their livelihoods as result of the scarcity of water. Abandoning livelihoods as a result of water scarcity in Majapereng Electoral Division has the potential of exacerbating social and economic consequences such as poverty and food insecurity. Abandoning livelihoods such as agriculture results in women relying on external sources and this can be expensive for low income families in Majapereng Electoral Division. The scarcity of water calls for women to participate in livelihood activities that are not reliant on water. The incidence of water scarcity, according to the results is caused by prolonged drought. The results indicate that water sources are heavily dependent on rain and so drought exacerbates the condition of scarcity. The scarcity of water means reduced availability of drinking water for the population of Majapereng Electoral Division. Reduced access to water means the inaccessibility of water for irrigation for agricultural purposes. Generally, droughts impact on agriculture as a livelihood for women in Majapereng Electoral Division.



The issue of water scarcity adversely impacting on the agricultural activities of women in Majapereng Electoral Division is consistent with a study on agricultural-related water scarcity in water-scarce countries which revealed that water scarcity significantly reduces agricultural yields and food production, threatening food security and nutrition, especially in regions with arid climate and water-intensive crops (Beithou *et al.*, 2022). The scholars highlight the severe impact of water scarcity on food production and the need for a multifaceted approach involving technological, policy, and collaborative efforts to ensure sustainable agricultural development. Additionally, this has been evidenced by scholars such as Algur *et al.* (2021) and Temberge *et al.* (2021) who have highlighted on the effect of traveling long distances to water sources.

On the issue of women abandoning their livelihoods, the study's results confirm the findings of the study on participatory design to address water crisis in the village of Karkatta, Jharkhand, India which reveals how water scarcity during the summer months, experienced by a community residing in the village of Karkatta, obligates the community to abandon their agricultural activities culminating in significant risk of poverty (Varma *et al.*, 2021). The scholars propose various solutions such as combining rainwater harvesting, irrigation strategies, and less water-intensive crop- based agricultural preferences while converting a water-scarce region to one of a water surplus. The findings consistent with these one are on water scarcity and agriculture: an overview of causes, impacts and approaches for reducing the risks. The results of the study indicate that decreased water availability for irrigation leads to crop failures and lower yields (Ingrao *et al.*, 2023). The scholars further indicate that lack of water results in the expansion of pests and diseases that affect crops due to drought and high temperatures. The scarcity of water contributes to increased pests and diseases that have the potential to lower production, impacting on the livelihoods of women as a result. The findings on women traveling long distances to water sources

are similar to the findings of the study on drought and households' adaptive capacity to water scarcity in Kasali, Uganda. The findings reveal that it is above 70% of the households spend longer hours collecting water during the dry years (Mukasa *et al.*, 2020). The scholars further indicate that about 10% of the population in Uganda (Northern and Southern parts of the country) experience drought related water scarcity annually. Drought is therefore a major contributor to the incidence of water scarcity.

The findings of this study are in line with the Feminist Political Ecology in that, when crops wilt as a result of water scarcity, women's livelihoods and food security are threatened (Bacon, 2022). Feminist Political Ecology highlights how the environmental degradation and resource depletion exacerbate existing gender inequalities (Mangura, 2021). Women in Majapereng often manage household water resources and agricultural production. This puts women at the greatest vulnerability to water shortages and soil degradation. Feminist Political Ecology highlights that these environmental stresses exacerbate existing gender inequalities as women face increased workloads and limited access to resources needed for food security (Bacon, 2022). In line with the feminist Political Ecology, women in Majapereng Electoral Division increasingly abandon their agricultural activities due to water scarcity, significantly impacting food security and livelihoods. Feminist Political Ecology highlights how gender inequalities exacerbate these challenges, as women often bear the dual burden of securing water for domestic needs and agricultural use (Nunbogu & Elliott, 2021).

#### **4.3.2.2 Water scarcity and Livestock production by women in Majapereng Electoral Division**

On livestock rearing, some women have clarified that livestock rearing is challenging in the face of water scarcity as women and animals share the same water sources, particularly from the wells. Some women explained that sharing water with animals is not by choice as their water sources are

not covered, giving animals easy access to water. In relation to the above, another woman had to say:

*Livestock production require significant amount of water for drinking. Lack of water reduces the availability, leading to inadequate hydration for the animals which affect their health and productivity. Natural forage is limited by the incidence of water scarcity. The scarcity of water leads to decreased availability of food for the animals, impacting on their overall health and nutrition. We have also experienced reduced fertility rates in animals. Our animals are often overcrowded at one limited water source, increasing the risk of disease transmission among livestock. Limited access to water directly impacts the quality and quantity of meat, wool and mohair. This, in turn, affects our income and food security (focus group discussion with women at Ha- Rampitoi in April, 2024).*

The results of this study demonstrate that livestock production as a livelihood activity for women in Majapereng Electoral Division is to large extend impacted by the scarcity of water as they need water for drinking. The findings revealed that water is not only a requirement for livestock consumption, but also reduces natural forage available for livestock. Reduced forage impacts on the health and nutrition of sheep, goats and cattle in Majapereng Electoral Division. The results also show that lack of water causes low production of wool, mohair and meat for their sheep, goats and cattle. Low production means that there is reduced income and food security is impacted. Water scarcity has caused low production in terms of animal quality, wool and mohair.

The results above are consistent with the findings of a study on the impact of water scarcity on dryland sheep meat production and quality. The study established that, despite the capability of

sheep to survive in relatively long periods with little water, the deficiency of this vital nutrient produces lightweight carcasses and dry, less tender meat (Chikwanha *et al.*, 2021). According to the findings of the study, lack of water has impacted on the quality of meat for sheep, reducing the potential for quality produce and reliable market.

#### **4.3.2.3 Water scarcity and impact on women's traditional beer brewing**

This study found that the scarcity of water has adversely impacted on the business of beer brewing as a livelihood of women in Majapereng Electoral Division., women brewing traditional beer mentioned that beer brewing requires too much water use. They indicated that they are not able to brew enough beer for their customers in the face of pronounced scarcity. This has sometimes led to women raising the prices in order to meet the demands of a certain class of people. The study also unearthed the scarcity of water affecting everyone in the community and as a result, impacting on the ability to make profit and meet their livelihood needs. The time spent searching for water, according to the uncovered results, could be used for either brewing traditional beer or other income generating activities Women confirmed the above by saying:

*We need more water to make large batches. We spend more time fetching water from far away and it takes away from the time we could spend brewing or doing domestic work including other income generating activities. We hope for solutions that will bring more water to our community. It would make a big difference for us (focus group discussion with women at Ha- Ramoitoi in April, 2024).*

Brewing traditional beer as a livelihood activity in Majapereng Electoral Division requires the greatest amount of water throughout the production process. As water constitutes a larger amount of water, the scarcity of water hinders brewing operations, affecting both quantity and quality of beer. Brewers may face competition for water resources, leading to increased conflicts with local

communities. Additionally, sustainable water management and use is vital for the availability of water.

The concept of brewing traditional beer as a livelihood of women in Majapereng Electoral Division corroborates with the findings of the study on the analysis of the impact of water scarcity on beverages production in Namibian breweries. The major findings of this study were that beer production uses water intensively (Uupindi, 2019). The scholar added that the shortage of water interrupted production during the brewer's peak in 2016. These results indicate that brewing traditional beer requires a lot of water and the scarcity negatively impacts on this livelihood activity.

The findings of this study have established that water from the boreholes in Majapereng village has been initially available. The findings reveal that the availability of water gradually decreased in the recent years. Water access has recorded a decline and it can be said that it is unreliable. Unreliable water in Majapereng village indicate that there is not enough water to accommodate the population in Majapereng village.

Women in Ha- ramoitoi also supported the fact that available water is not enough for the population and they even explained that the situation is worse because there are often conflicts resulting from water management in families of the three villages (Boikano, Pont'seng and Ha-ramoitoi). The results therefore indicate that the scarcity of water triggers conflicts in families. In relation to above, one woman had to say:

*Sometimes we fight over management of water. At other times, the scarcity of water triggers conflicts which range between families and sometimes between villages.*

*However, the chiefs intervene and issues solved accordingly (focus group discussion with women at Ha- Ramitoi in May, 2024).*

The scarcity of water has triggered conflicts in Majapereng Electoral Division. These findings share similar results with the study on water scarcity and social conflict. The findings of the study reveal the scarcity of water is likely to provoke conflicts (Unfried *et. al.*, 2022). Similar study reveals that water scarcity crisis exacerbates conflicts, particularly in regions like Sudan and the Horn of Africa, where competition for dwindling resources leads to violence and displacement (Nkatha, 2024). This scholar indicates that vulnerable populations especially women and children face increased hardships as they struggle to access safe water, further entrenching poverty and social inequalities.

Feminist Political Ecology appears to be relevant in the instance where the scarcity of water has caused conflicts within families and also affects the villages in Majapereng Electoral Division. Feminist Political Ecology indicates that gender inequality leads to reduced rights for women to own land, gain access to water, and participate in water governance (Bacon *et al.*, 2021). Inequalities existing within families in Majapereng Electoral Division has resulted in poor management of water, exacerbating conflicts in within the family. Feminist Political Ecology emphasises the importance of integrating gender analysis with the study of food and water security, resource access and governance (Resurreccion & Chavez, 2019).

#### **4.4 Intervention strategies to address water scarcity in Majapereng Electoral Division**

This section discusses the findings related to different strategies that were implemented to address the challenges of water scarcity in Majapereng Electoral Division. The study established a number of measures that were implemented by the Government of Lesotho and Non-Governmental Organisations and the community to curb the problem of water scarcity. The strategies are water

harvesting, construction of solar powered taps, construction of community dams and training on water saving.

#### **4.4.1 Water harvesting**

The findings of the study revealed that Government of Lesotho and the community embarked on water harvesting strategies and among them include harvesting of rainwater. The results also indicate that some women harvest water through the tanks. According to the findings, harvesting rain water support women livelihoods such as agriculture. However, evidence shows that some women do not have tanks water rain water harvesting as they do not have enough money to buy them. In relation to the above, one woman had to say:

*We have adopted the rain water harvesting through household tanks as an innovative strategy to curb the incidence of water scarcity in Majapereng Electoral Division. However, tanks are very expensive, leading to their unavailability in some of the families. The strategy therefore does not accommodate all households within Majapereng Electoral Division due to financial problems (Extracted from a questionnaire in Majapereng, May, 2024).*

In a focus group discussion, another woman had to say:

*Water harvesting through the tanks assist in supporting our agricultural activities. We use water from the tanks for irrigation purposes. Sometimes we use water from the tanks for animal drinking (Focus group discussion at Ha-Ramoitoi, in April, 2024).*

Rainwater harvesting through water tanks is an innovative strategy to address the problem of water scarcity and support the livelihoods of women in Majapereng Electoral Division. Livelihoods

activities such as participating in agriculture is supported by water harvested through the tanks. Rainwater harvesting significantly enhances women's livelihoods by providing access to water, reducing time spent on water collection.

The findings of this study share similar results with another study which reveal that rain water harvesting through tanks is a common method of collecting and storing water that can subsequently be used for different purposes (Alim *et al.*, 2020). Similarly, in Bangladesh, the gender-responsive coastal adaptation project empowers women as change agents, improving their access to safe drinking water and allowing them to invest time in education and economic opportunities (UNDP, 2022).

Rainwater harvesting through water tanks significantly enhances women's livelihoods and aligns with Feminist Political Ecology principles by empowering women, improving their access to natural resources such as water in this case, and enabling women to participate in economic activities (Thakur, 2020). In the context of this study, some women in Majapereng Electoral Division have access to water through water harvesting, reducing their time for water collection and creating opportunities to participate in income generating activities.

#### **4.4.2 Construction of solar powered taps**

The findings of this study also revealed that Government of Lesotho has assisted the communities in Majapereng Electoral Division by installing solar powered taps in an effort to address water scarcity within the area. The results further indicated that the Government of Lesotho works with Non-governmental organisations in making water available to rural people. With regards to the above, one official from the Department of Rural Water Supply had to say:



*We have installed solar powered taps in the area of Majapereng Electoral Division. This was in response to the Lesotho Water and Sanitation Policy 2007 which intends to promote adequate and sustainable supply of portable water and sanitation services to all of the population of Lesotho. The Lesotho Water Act 2008 is an act of parliament that intends to manage, protect, conserve, develop, and sustainably use water resources in Lesotho. We are therefore working hand-in-glove with the Non-Governmental organisations such as World Vision and Red Cross to make water available and accessible to everyone nationwide (Interview with an official at the Department of Rural Water Supply in May, 2024).*

In addition to the above, one women had to say:

*The government in collaboration with other non- governmental organisations have installed solar powered taps in our area. We have had water for a long time until now when there seems to be leakages in water infrastructure. The solar panels are too old and I believe they require replacement as sometimes there is no water at all at the taps (Extracted from a questionnaire at Majapereng village in May, 2024).*

The solar powered taps transform livelihoods of women in rural communities by providing reliable access to water for crops and household. These taps also offer safe drinking water to communities. On the other hand, worn out water infrastructure critical impact on livelihoods of women in rural areas. When water infrastructure is worn out, water is lost and women are mostly affected as they are responsible for water collection. Women have to travel long distances to water sources and this time poverty restrict their ability to focus on income generating activities.

Related to the findings of this study is the results of the study on the feasibility of solar- powered groundwater pumping systems in rural areas of greater Giyani Municipality in Limpopo, South Africa. The study revealed that most of the villages in Limpopo rely on the solar powered community taps (Jovanovic *et al.*, 2023). The scholars also highlight that the solar powered taps provide safe and secure water supply and is also adapts to climate change and the increased frequency of droughts.

#### **4.4.3 Construction of community dams**

The findings of this study established that women including the communities have constructed community dams. The community dams act as alternative water sources to support both agricultural and livestock production activities. Regarding the above, one community leader had to say:

*The government has provided assistance in making water accessible to everyone by constructing community dams in our villages. These dams are important as they support our agricultural activities and our sheep, goats and cattle normally use these dams for drinking water (Interview with community leader at Ha- Ramoitoi in April, 2024).*

Unlike the water tanks which are available to economically stable households, the construction of dams has created the accessibility of water to everyone. These community dams help in the sustenance of agricultural activities of women. Sheep, goats and cattle are also able access these dams to access water, as a result, livestock production is also enhanced through the construction of dams.

The results on the construction of community dams are consistent with the findings of the study conducted in India on the water-efficient technologies for sustainable development which revealed that sustainability of water is achieved when there is sufficient water for meeting needs such as agricultural demands, and this can be accomplished through construction of dams and storage tanks in rural communities (Varma, 2022). The construction of community dams and water harvesting through tanks reduce unavailability of water in Majapereng Electoral Division and these are the only innovative strategies meant to improve water access in Majapereng Electoral Division.

#### **4.4.4 Community training on water saving techniques**

This findings of the study revealed that the Government of Lesotho and Non- Governmental Organisations have worked collaboratively with communities in providing education on the management and techniques on saving water. Evidence indicate that women, men, and children are invited to participate in these activities. The Department of Rural Water Supply indicated that there is cooperation between the village chiefs, councilors and the Department of Rural Water Supply. In relation to the above, one government official is quoted saying;

*We have worked with World Vision on and Red Cross to educate the people about the proper management of water. These organisations have provided education on water management through public gatherings (Lipitso) and they are sensitised on the proper management of water. These activities are attended by everyone, children, women and men. We continue to invite interested organisations to assist the government in meeting the water- related needs especially the needs of women. Ensuring water availability help address the disproportionate burdens placed on women in insuring water availability in households (Interview with an official at the Department of Rural Water Supply in May 2024).*

One woman also confirmed having received training related to management and saving of water by saying:

*We have received training on management and techniques for saving water. This training has made a significant contribution to our daily experiences as our area has experienced the shortages of water for a long time. As result of water scarcity, the government in cooperation with World Vision and Red Cross have worked towards teaching communities on the methods of purifying water. We have also learned that water can be re-used for the benefit of agriculture (Extracted from a questionnaire from Majapereng in May, 2024).*

Education in water management and conservation is crucial for sustainable practices. It enhances community understanding of water usage, promotes efficient techniques like rain water harvesting, and fosters behavioral changes to reduce waste. Similar to the findings of the study is a study on water conservation and management practices at the University of Sharjah to achieve sustainability excellence. The results revealed that, to stimulate the different aspects of sustainability, education on water management and education is crucial (Siddique *et al.*, 2021). The scholars further indicate that water conservation programs and initiatives such as the use of innovation and technology, reuse and recycling of water play a vital role in sustainable development.

#### **4.5 Chapter Summary**

The study found that women in Majapereng Electoral Division depend on various livelihood activities for their survival. In accordance with the findings of this study, agriculture makes a larger contribution as a livelihood for women in Majapereng Electoral Division. The findings of this study also revealed that livelihood strategies in Majapereng Electoral Division also include livestock production. Some other livelihood activities for women in Majapereng Electoral Division

include brewing and selling traditional beer. The livelihood activities mentioned require a reasonable amount of water.

The study established that the scarcity of water has impacted on the livelihoods of women in Majapereng Electoral Division. On agriculture, the scarcity has caused a decline in production as crop wilt away. Having to travel long distances to water sources has resulted in women having no time to care for their agricultural activities and other income generating activities. Livestock such as sheep, goats and cattle, which form part of women's livelihoods in Majapereng Electoral Division, were also affected by the scarcity of water. The scarcity of water has hindered the brewing operations, affecting both quality and quantity of beer.

In regards to communities, government and non-governmental organisations effort to address the scarcity of water in Majapereng Electoral Division, the study revealed that water harvesting techniques were introduced. These include rain water harvesting through tanks, the tanks were bought by different households in support of women's livelihoods mainly agriculture. Construction of solar powered community taps is also regarded as strategy to reverse the problem of water scarcity. The dams have supported women's livelihoods such as agriculture and livestock. The Government of Lesotho, World Vision and Red Cross have educated the communities on the techniques related to the management and saving of water.

## **CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATION**

### **5.1 Introduction**

This chapter focuses on the summary of dissertation, conclusion and makes recommendations to improve the livelihoods of women and the scarcity of water.

The study was guided by the two theories namely: The Livelihoods Capitals Framework and the Feminist Political Ecology. Both theories presented a weighty explanation behind the impact of water scarcity on the livelihoods of women in Majapereng Electoral Division. The Livelihoods Capitals Framework has proved to be the relevant framework for this study as it indicates that people combine their assets to undertake livelihood strategies. The framework views people as operating in a context of vulnerability, within which they have access to access to certain assets or capitals that provide the means of living. It is important to note that women in Majapereng Electoral Division are actively involved as major entities in this study. In the context of this study, the Livelihoods Capitals Framework offered a conceptual framework through which the relationship between the scarcity of water and livelihoods of women is understood. Women in Majapereng Electoral Division participate in agricultural production, livestock production and brewing traditional beer as their livelihoods. These livelihoods contribute to the livelihood capitals. These components are interrelated and important for the well-being and survival for individuals and communities.

Feminist Political Ecology appeared to carry more weight in explaining how the scarcity of water threatened livelihoods and food security of women. Feminist Political Ecology emphasises that that environmental degradation and resource depletion worsen gender inequality. Women in Majapereng Electoral Division control water resources and livelihoods. Women are susceptible to water shortages and this puts their livelihoods at risk. Rainwater harvesting not only increases

women's livelihood opportunities but acts as a strategy for women empowerment. This therefore positions rainwater harvesting in line with the Feminist Political Ecology as the framework supports that women must have access to natural resources such as water in this case. Women are also empowered and encouraged to participate in income generating activities for their families' benefit. Rain water harvesting has reduced time spent on water collection and has opened opportunities for women to participate in activities meant to sustain their livelihoods.

## **5.2 Summary of the dissertation**

The study is divided into five chapters of which, the first presents the introduction of the study. The study intended to investigate the feminine impact of water scarcity on rural livelihoods with special focus on Majapereng Electoral Division. Chapter two consists of the review of literature associated with the livelihoods activities for rural women, water and gender and water management and rural livelihoods. Literature indicated that women in rural areas often engage in livelihood activities such as horticulture, agriculture, handicrafts and small scale business for survival. Gender roles exacerbate the disproportionate burden placed on women in ensuring water collection. Some countries have introduced the Integrated Water Management strategy as a means to effectively manage water resources. Chapter three was the research methodology used to conduct the study. The study adopted phenomenology as a research design directing the study. Qualitative data was collected using interviews, focus group discussions and questionnaires. For the purpose of data analysis, thematic analysis was used for the analysis of collected data. This method of analysis allowed the researcher to identify, interpret and examine patterns and themes related to the experiences and challenges women face as a result of water scarcity. Chapter four presented the findings and the analysis of collected data using thematic analysis. The findings reveal that women in Majapereng Electoral Division participate in agriculture, livestock

production, and brewing traditional beer as livelihoods activities. The scarcity of water negatively impacts on the livelihoods of women by causing a decline in production- both agriculture and livestock production and at the same time affecting the quality and quantity of traditional beer. The government in collaboration with non-governmental organisations and the community have worked together in water harvesting, installation of solar-powered taps and construction of dams. The summary, conclusion and recommendations grounded on the findings of the study are presented in chapter five.

### **5.3 Conclusion**

The primary objective of the study intended to examine the livelihood activities of women in Majapereng Electoral Division. The first objective examined the livelihood strategies of women in Majapereng Electoral Division and the importance of water in sustaining the same livelihoods. The study concludes there are different livelihood activities that women participate in for their survival. The study confirmed that women in Majapereng Electoral Division participate in agriculture, livestock production and brewing of traditional beer as important livelihood activities for women. This study therefore concludes that water is an important resource required by women to sustain their livelihoods.

The second objective assessed how the scarcity of water impacts on the livelihoods of women in Majapereng Electoral Division. This study concludes that the scarcity of water has negatively impacted on the livelihoods of women in Majapereng Electoral Division. The study confirmed that the scarcity of water impacted on the livelihoods of women differently. The scarcity of water has caused a decline in agricultural production, deterioration in livestock production. The scarcity of water has impacted on the quality and quantity of traditional beer brewing and all its processes.



The last objective assessed how the government, communities and non-governmental organisations have worked towards addressing the scarcity of water in Majapereng Electoral Division. The study concludes that government's contribution on the initiatives meant to address water scarcity has assisted communities in addressing the scarcity of water. The study confirmed that the government, non- governmental organisations and the community have addressed the incidence of water scarcity in different ways. The study found that the cooperation between the government, communities in Majapereng Electoral Division and non-governmental organisations have installed solar powered taps, introduced rainwater harvesting, and also helped in the construction of community dams.

#### **5.4 Recommendations**

Recommendations that could be made relating to promoting the livelihoods of women and innovative strategies to reverse the scarcity of water are pointed as indicated below;

- The study revealed that there are limited water sources available in Majapereng Electoral Division. In order to reduce the burden of women having to travel long distances to water sources, the study recommends that the Department of Rural Water Supply increase the number of water sources.
- It is recommended that the Ministry of Water invest in sustainable water supply systems such as boreholes, to reduce the time women spend fetching water.
- The study established the challenge of lack of defined water management strategies therefore the Government of Lesotho should implement the policy related to Integrated Water Resource Management (IWRM) making sure that water is managed in a coordinated way with land use, planning and development.

- The study established the absence of gender policies addressing water scarcity therefore, the study suggests that the Ministry of Natural Resources and Ministry of Gender, Youth, and Social Development should work collectively to incorporate gender in all the stages of policy making- planning, implementation and evaluation process. The mainstreaming of gender in all sectors with a focus on water governance and agriculture.

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**APPENDICES**

**APPENDIX 1: QUESTIONNAIRE FOR WOMEN**

My name is Refuoe Mpatlise, a second year Masters student at the National University of Lesotho.

I am pursuing Master of Arts in Development Studies. I am conducting a study as part of the requirement for this qualification. My research topic is Feminine impact of water scarcity on rural livelihoods: the case study of Majapereng Electoral Division. I guarantee that data collected during this time will be used for this research and academic purposes and as a result, confidentiality will be considered.

Please take note that:

- Your privacy will be safeguarded, as your contributions will not be linked to you personally, but will be reported solely as opinions from a member of the population.
- Information provided by you will not be utilized against you, and the data collected will solely serve the purpose of this research.
- Data will be securely stored for a duration of five years
- You are free to choose whether to participate, refrain from participating or discontinue your participation in the research, and no penalties will be imposed for any decision you take.
- Your engagement is solely for purposes, without any financial benefits attached.

**Background Information**

Sex: .....

Village: .....

Sources of water: .....

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**Section 1: Livelihoods strategies of women**

1. What are the primary sources of income for your family?

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2. How do you contribute to the household income?

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3. Are there specific livelihood activities that are traditionally associated with women in your community?

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4. What are the main challenges women face in pursuing livelihood activities?

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5. Are there any programs or initiatives aimed at supporting women's livelihoods in your community?

YES	NO
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If yes, which are they?

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6. Have you received any training or skill development to enhance your livelihood opportunities?

YES	NO
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If yes, what kind of training did you receive?

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7. What type of skills or training would women in your community benefit from to improve their livelihoods?

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Section 2: Water scarcity and women livelihoods

8. Are there any specific times or seasons when water scarcity is more pronounced in your community?

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9. What challenges do women face in accessing clean water compared to men?

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10. How does water scarcity impact women's daily lives and responsibilities?

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11. How does water scarcity influence your health and well-being, especially in terms of hygiene, sanitation and reproductive health?

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12. Are there any income-generating activities impacted by water scarcity? Which are they?

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13. How are the above mentioned livelihoods impacted by water scarcity?

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14. Have you had to change or abandon your income-generating activities due to scarcity of water?

YES	NO
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If Yes, which livelihood activities were abandoned?

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15. Have you experienced changes in crop yields due to water shortages?

YES	NO
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16. Have you noticed any changes in health or well-being related to water scarcity?

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17. In what ways do you believe that addressing water scarcity could empower women and enhance gender equality in your community?

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**Section 3: Intervention Strategies the government**

18. What are some innovative strategies for conserving water in your community??

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19. What are the economic implications of investing in water conservation and management measures?

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20. How can government policies and programs effectively support water infrastructure development in your community?

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21. Are there any government or NGO interventions addressing water scarcity in your area?

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22. What improvements or support would you like to see regarding water access and management?

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Thank you for completing this questionnaire. Your input is valuable in understanding the challenges faced by women in rural communities regarding water scarcity and livelihoods.

## **APPENDIX II: FOCUS GROUP DISCUSSION GUIDE**

### **Focus group discussion questions for women**

#### **Section 1: Water Scarcity and rural livelihoods**

1. What are the primary livelihood activities women engage in within your communities?
2. How do you perceive the importance of your livelihood activities for your overall well-being and that of your families?
3. What are the main barriers women face in accessing and participating in various livelihoods activities?

#### **Section 2: Water scarcity and women livelihoods**

4. How does water scarcity affect the daily lives and livelihoods of women in Majapereng Electoral Division?
5. In what ways does water scarcity influence women's physical and mental health in your community?
6. What are the risks and vulnerabilities faced by women and girls when they travel long distances to access water sources in your community?
7. How do women's roles in water management and conservation contribute to community resilience and adaptation to changing environmental conditions?
8. What are the coping mechanisms employed by women to address water scarcity and how do these strategies impact their overall well-being and household dynamic?
9. What are the specific challenges faced by women in accessing water?

10. How do these challenges intersect with the factors such as social activities?
11. How do these challenges affect the economic status in this geographical location?
12. How do gender roles and cultural norms shape women's experiences and responses to water scarcity in your communities?
13. What are the specific challenges faced by women in accessing water sources in your communities?
14. What are the social and economic implications of women's increased burden in water collection and management in your community?
15. In what ways do women participate in decision making processes related to water management?
16. How do women perceive and experience water scarcity in their daily lives, particularly in relation to household chores, household activities and personal hygiene?
17. How does water scarcity affect the daily routines and responsibilities of women in your community?
18. How does water scarcity impact women's access to economic opportunities in your communities?

### Section 3: Interventions meant to address water scarcity

19. What intervention measures are being implemented by community leaders such as councilors to address the water scarcity?

20. What intervention measures are being implemented by governments in relation to the scarcity of water?
21. To what extent do these interventions address help to address challenges faced by women in accessing water?
22. To what extent do these interventions effectively address gender disparities in access to water resources?
24. What suggestions or recommendations do you have for the government to ensure that there are provisions of water in your community?

## **APPENDIX III: INTERVIEW GUIDE**

### **Interview guide for the chiefs**

1. Which water sources do you have in your village??
2. How reliable are the sources you have mentioned above?
3. What are the livelihood activities for women in your village?
4. Do women get water to support the activities you have mentioned above?
5. What are the main barriers or challenges faced by women in accessing clean water and sanitation and how do these challenges affect their livelihoods?
6. What are the major causes of water scarcity in your area?
7. What coping strategies have been adopted by the community to mitigate the effects of water scarcity?
8. How has water scarcity influenced social dynamics and relationships within the community?
9. What initiatives have been introduced by government to address the incidence of water scarcity in your village?
10. How do community members perceive the effectiveness of government or NGO interventions in addressing water scarcity?
11. How would you advice government to address the water scarcity issue in your village?

## **INTERVIEW QUESTIONS FOR THE COUNCILOR**

1. What are the major sources of livelihoods for women within the Majapereng Electoral Division?
2. How would you describe the availability of water within your Electoral Division?
3. Have you noticed any changes in water availability over the past few years? If yes, please describe.
4. How are women impacted by the scarcity of water within the ED?
5. Do women contribute in the management of water resources?
6. Are women able to meet the livelihood activities at the same time ensuring the availability of water in their homes?
7. How does water scarcity specifically affect women's daily tasks and responsibilities within the household?
8. What do you envision as potential long-term solutions to address water scarcity in your community?
9. From your perspective, what are the most pressing challenges faced by women in accessing water during periods of scarcity?
10. Can you share any anecdotal or observed instances of how water scarcity specifically affects the livelihoods of women in rural areas?
11. In your own experience, what are the main barriers preventing women from accessing sufficient water resources and what steps are being taken to overcome these barriers?

12. Are there any successful initiatives or programs that you have been involved in that have effectively improved rural women's access to water resource and enhanced their livelihood opportunities?

13. How can the councilors and local authorities collaborate with the Department of Rural Water Supply and other relevant stakeholders to implement gender responsive strategies for mitigating water scarcity and supporting rural women's livelihoods?

14. How do you envision the future of water resource management in rural areas, particularly in terms of ensuring gender equity and promoting sustainable development for all community members?

## **INTERVIEW QUESTIONS FOR THE DEPARTMENT OF RURAL WATER SUPPLY**

The initiatives introduced by government to curb the issue of water scarcity

1. Is the department aware of the water sources within Majapereng Electoral Division?

2. Are the water sources enough to meet the water needs of the communities?

3. How does the department perceive the specific challenges women in rural areas face due to water scarcity?

4. Can you provide insights into any existing policies or initiatives aimed at addressing the water needs of rural women?

5. What are the department's observations regarding disproportionate burden placed on women in accessing water?



6. How does the department collaborate with local communities and organizations to ensure gender-sensitive approaches to water management and distribution?
7. In your experience, what are the primary concerns or struggle voiced by rural women regarding water scarcity and its effects on their livelihoods?
8. Can you share examples of successful projects or interventions implemented by the department that have positively impacted rural women's access to water and livelihoods?
9. Are there any specific challenges or barriers the department faces in promoting gender equality in water resource management and rural development?
10. What recommendations does the department have for further improving the integration of gender considerations into water scarcity mitigation efforts and rural development initiatives?