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**LIVELIHOOD-MAKING FROM THE ENVIRONMENTAL RESOURCES:
THE FIREWOOD TRADING AND MARKETING IN ROMA, LESOTHO.**

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DECLARATION

I, Lineo Ralejoe, declare that this dissertation is my original work and has not been presented for examination in any other university for any academic certificate or award.

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ABSTRACT

Firewood trading in Roma came about mainly as a result of the high levels of poverty and unemployment. This livelihood-making strategy may seem cost-efficient to start as it does not require much capital. With only a hand saw, the business can commence. However, numerous challenges associated with firewood trading prohibit traders from generating enough income to support their households. Most of the firewood traders in Roma are breadwinners that rely on firewood trading as the primary source of income. Due to firewood trading ineffectiveness, they still live in poverty. In Roma, firewood marketing does not pose much environmental threat because it is done on a small scale. In addition, conservation measures are put into practice.

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CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter offers a detailed history of the problem which is the degradation of environmental resources as a result of making a living out of them. The problem will be stated clearly to clarify why people opt for environmental resources to make a living and how they make a living out of environmental resources, not leaving out the effects of using environmental resources to make a living. To determine whether this study is researchable, the aim of the study will be backed up by measurable objectives. The relevance of the study provides a briefing of how the study findings may be helpful. Since the subject matter of the study is broad, a scope will be offered to show what the study is limited to. The key terms that will be used throughout the research study will be defined.

1.1. Background to the Study

From the pre-colonial era, people across the globe have been using environmental resources for livelihood-making. According to Secorun (2018) the Khoi-San, the first occupants of Southern Africa had no permanent homes, they moved from place to place in search of places with plenty of environmental resources since they were hunter-gatherers. They settled in a certain place until they had depleted the environmental resources in that place and then they move to a new place with resources that would help to sustain their lives. They relied on the environment for food, hunted wild animals and gathered fresh fruit, vegetables and roots. The era that they lived in ended up being called the stone age because they used stone for a lot of purposes such as making weapons that were essential for survival as there was a high competition amongst different tribes for resources. Stones were also used to create a spark to light a fire, dig up roots that they ate and used for medical purposes. For shelter, they plaited ropes with long grass with which they tied together a few branches from trees. Some rocks were spilt open to produce sharp edges that were used to sharpen the sticks that they used to spear the fish. Spearfishing was the only method of fishing used since hooks and nets hadn't been developed then (Smith 2019). Iddon & Evans (2022) claim that stone age was global and the way of life was pretty much the same worldwide.

History.com Editors (2018) mention that the shift from using stone to metal was first known as the bronze age then later the iron age. During this period, cultivation gained popularity as the tools made from bronze made cultivating simpler. It is in this era that people started building permanent homes using stone for walls and thatch for roofing. Both of these are environmental resources. When a tribe found a place with good pastures for livestock, water and fertile arable land for cultivation, it settled permanently in that place. With the bronze-age came inventions such as the wheel and ox-drawn plough (Augustyn, 2023). The emergence of cultivation meant that people continued to use environmental resources to sustain their lives. In this case they used the land to grow the crops that they ate. The invention of the wheel gave birth to many tools including the spinning wheel. With the aid of the spinning wheel, an environmental resource (cotton) was transformed into the fabric that human beings use for clothing. Not only was the spinning of cotton used to clothe people but it also helped them to generate income by selling fabric and creating employment for spinners (Styles 2020). The shift is that agricultural societies caused land degradation because of limited knowledge and experience in agriculture; when it rained the water eroded the topsoil because the cultivators planted vertically across slopes instead of practising terracing. Not only does terracing increase production but it also conserves water and prevents soil erosion (Deng et al., 2021).

Livelihood-making from environmental resources continued and got worse in the 1600s when the logging industry began. Mulligan (2016) mentions that logging began when the Jamestown settlers cut down trees to build new homes in their new world. Because it was only the beginning of the logging industry, the impact of logging on the environment did not have noticeable effects on the climate or atmosphere temperatures. It may have only affected the animals that used the forest trees as shelter and a source of food supply. According to Mulligan (2016), logging got more intensive when the discovery era grew. The need for ships arose as the colonisers needed bigger ships to travel to their colonies to extract and transport minerals, slaves and other commodities.

1.2. Statement of the Problem

Due to the high levels of poverty, food insecurity and unemployment, people are forced to turn to environmental resources for their livelihood. Despite many poverty reduction schemes that have been introduced in Lesotho, poverty levels remain significantly high. In 2021, the poverty rate in Lesotho was 36%. This means that 36% of Lesotho citizens lived under \$2.15 per person,

per day. Covid-19-related lockdown measures and the rising food prices have limited the efficiency of some poverty reduction schemes (The World Bank, 2022). According to IPC Food Insecurity Analysis (2022), 328, 000 people in Lesotho are faced with food insecurity. This is a serious issue in Lesotho because it results in social unrest in different forms such as crime and depletion of environmental resources. As is the case in other developing countries, the unemployment rate in Lesotho is high. It was 24.6% in 2021(O'Neill, 2023). High unemployment gives rise to high poverty and food insecurity rates.

The Lesotho Forests are used as the sources of firewood for domestic use (heating and cooking). The trees are not replaced and this contributes to the degradation of the forests. There is currently an intensified cutting of forests for the marketing of firewood by communities living adjacent to the forests. Due to the marketing of firewood, forests are faced with severe degradation. Trees are cut without being replaced. According to Masilo (2002), the firewood used in Lesotho exceeds the sustainable use level; that is to say, more trees are being cut down than are planted, and at this rate, forests will eventually die.

1.3. Purpose of the Study.

The purpose of the study is:

- To investigate the impact of cutting down trees for a livelihood on the forests in the Roma community.

1.4. Objectives of the Study

- To investigate the factors which contribute to the community use of forest trees as a livelihood –making strategy.
- To examine the measures used by community members to conserve forests and forest resources.
- To assess the contribution of wood marketing to the improvement of the community's living standards.

1.5. Research Questions

This research study questions are as follows:

- Which factors contribute to the community use of environmental resources for making a living?

- What environmental conservation measures are used by community members for a sustainable use of forests and forest resources?
- How does firewood marketing contribute to the improvement of the community living standards?

1.6. Hypotheses

- Tradition, unemployment and poverty force people to use environmental resources for livelihood making.
- The Village chiefs control the use of the forest resources.
- Firewood marketing provides income for some of the community members.

1.7. Significance of the study

The main relevance of the study may be to make the community members of Roma aware of the effects of using environmental resources for livelihood-making and how it may affect the future generations' ability to meet their needs. The findings of the study may also improve the community members' knowledge of the sustainable use of environmental resources to avoid further environmental resource degradation. Through the recommendations, the study may help the community to look into more sustainable ways of livelihood-making whilst preserving environmental resources. The study may make the relevant ministries aware of the knowledge that the communities of Roma have on environmental resource protection and the laws that govern it and if the knowledge is not sufficient then the communities will be educated and given skills that will help them to protect the resources.

1.8. Assumptions of the Study

The environmental resource degradation that is taking place at Roma has been caused by both natural and human activities and the most negative impact is caused by human activities. Human beings use environmental resources to maintain their livelihoods. In the process, such resources face severe degradation and, in the worst cases, extinction. Human beings extract environmental resources rapidly to the point where they fail to regenerate themselves. Roma community members probably have inadequate knowledge about sustainability. Some of the reasons why community members of the two areas of study use environmental resources for livelihood

making are that they are unemployed and living in poverty. They cannot afford alternative means of livelihood making.

1.9. Delimitations of the Study

Although many parts of the world are experiencing environmental resource degradation, the study will only focus on environmental resource degradation that is taking place in Roma. The only cause of environmental resource degradation that will be reviewed in the study is livelihood-making from environmental resources. With all the environmental resources faced with degradation, this study will focus on trees, shrubs and root plants.

1.10. Definitions of key terms

1.10.1. Livelihood:

- According to Tanveer (2016), livelihood can be best defined as methods and means of making a living in the world. Mphande (2016) claims that a livelihood can be defined as the activities, the assets and the access that jointly determine the living gained by an individual or household, such activities include finding food, shelter and other essentials necessary for human survival. Mphande (2016) concurs with Serrat (2008) on the definition of livelihood by defining it as comprising the abilities, assets and tasks that are mandatory for securing a living.

1.10.2. Environmental resources:

Environmental resources are the living and non-living constituents of the Earth, comprising the biophysical environment that may benefit humanity, (Balasubramanian, 2006) as well as those organic and inorganic materials which are of great value to humans, animals and plants (Busola, 2016). Environmental resources include natural resources and human efforts or influence to add more functionality to them as they were found in nature

1.10.3. Degradation:

In this study will be looking into land degradation which is the decline in land condition that results in loss of value to biodiversity and destruction in the ecosystem (Bardgett, 2022). Bai et al. (2008) offer a similar definition of land degradation, they say it is a long-term decline in ecosystem functioning and productivity.

1.10.4. Poverty:

Samson (2022) defines poverty as the state where one has inadequate basic needs such as clothing and shelter. However, Goulden and D'Arcy (2014) point out that basic needs differ

according to the society that one lives within. Therefore his definition of poverty is being unable to meet the minimum needs that are deemed reasonable by the standard of the society in question. When the total income does not cover the basic needs of every member of the family, then that family is considered to be living in poverty (United States Census Bureau, 2022).

1.10.5. Unemployment:

Corporate Finance Resources Team (2022) defines unemployment as a situation whereby employable individuals are actively seeking jobs but are unable to find them while International Labour Organisation (2018) defines it as part of the labour force that is not working but is able to work and is seeking jobs. The Organization for Economic Co-operation and Development (OECD) shares the same idea with International Labour Organisation (2023) about defining unemployment as employable individuals without jobs. The only difference is that the OECD indicates that an individual is supposed to be fifteen years of age or above to be as categorised as unemployed.

1.11. Theoretical Framework

This section outlines the theoretical framework that was used to understand how best people can make a living out of environmental resources whilst ensuring that their resources do not get depleted.

1.11.1 Sustainability Theory

The literal meaning of sustainability is the capacity to maintain an outcome or process over time. Sustainable processes do not exhaust the material resources on which they depend. For instance, a community that depends on fish as its staple food may practice fishing methods that ensure that fish does not get completely depleted or lose its quality. Sustainability can also be viewed as an intergenerational concept where economic actions that are carried out with the use of environmental resources and do not limit the opportunities for the future generations to enjoy similar benefits.

The theory of sustainability originated in the 1960s when the environment movement grew due to concerns about social issues such as high population growth (Millar, 2012). As the population began to grow rapidly, consumption of important resources such as wood and coal simultaneously increased. This boosted the need to protect such resources from depletion. As a result, protective measures had to be taken to protect the resources whilst they are still being

used to sustain human life (Du Pisani, 2007). The theory supports the use of natural resources to the greatest possible extent but makes sure that future generations will be able to use the same amount of resources (Martins-Gracia & Diez, 2012).

For the sustainability theory to be successful, nations across the globe have to work together because it aims at solving nationwide problems; thus the United Nations adopted Agenda 30 with its 17 Sustainable development goals. Sustainable development goal 15 aims to “protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss” (Baumgartner, 2019). Sustainable forest management originated as a solution to the need to preserve forest resources for use by future generations (Martins-Gracia & Diez, 2012). Amongst other things, forest management is achieved by cutting trees at the same rate that they grow. This ensures that the trees do not get depleted and that people still use the trees to their economic advantage (Wilderer, 2007).

1.13. Summary

This chapter comprises twelve sections, the introduction, background to the study, the statement of the problem, the statement of the purpose of the study, objectives of the study, research questions, hypotheses, significance of the study, assumptions of the study, delimitations of the study, definition of the key terms and the summary. Most community members from Roma are unemployed and live in poverty. Therefore they depend on environmental resources for survival and this causes resource degradation as they are extracted at alarming rates. The study may educate the members of the affected areas on how to prevent further degradation of the environmental resources.

CHAPTER TWO

THE CAUSES OF FOREST DEGRADATION IN DEVELOPING COUNTRIES

2.0 Introduction

Environmental degradation is an ongoing issue that affects the entire world but is worse in developing countries. In order to find solutions to this issue, the causes of degradation must be identified. Looking into the cause of the problem and correcting it at the source accelerates problem-solving and offers long-term solutions rather than dealing with the results of the problem which only offers short-term solutions and repetition of the same problems. This chapter focuses on the causes of forest degradation mitigation and policies on forest degradation in developing countries. These will be discussed in detail in this chapter.

2.1 Causes of Forest Degradation

The environment is constantly changing and the changes are both positive and negative though the downside of environmental changes outweighs the advantages. The downside of environmental change contributes to forest degradation. In this case, forest degradation is defined as a reduction in the capacity of a forest to produce ecosystem services such as carbon storage and wood products as a result of anthropogenic and environmental changes (Thompson, 2013). Environmental degradation may be driven by other factors that are natural or the results of human activities.

2.1.1 Climate Change

According to Aho & Bankole (2018), climate change refers to long-term transitions in the conditions of the atmosphere. These transitions may be natural or the results of human activities. Although proper figures are not yet available, it has however been proved that changes in the solar cycle cause climate change to a slighter degree. Sasidharan (2022) points out that climate change has recently been identified as a major cause of forest degradation. Although trees have a long life span of about two hundred years and can tolerate climate fluctuations, abrupt changes in the climate result in tree mortality and species decline (Leohle, 1988). Extreme climate events such as droughts, floods, wind throws, tsunamis, hurricanes and wildfires cause long-term damage to forest trees. Recovering from the trauma caused by those weather events is almost impossible (Sasidharan, 2022).

Although drought and high-intensity rains erode the fertile topsoil, forest trees adapt to the changes of loss of soil moisture and soil nutrition by reducing their shoot-root ratio. That is, trees become shorter and thinner (Maskova, 2018). Only small trees have the ability to change their structure to adapt to the changing climate condition, Mature trees are unable to do so. They die due to inadequate water and nutrients (Leohle & LeBlank, 1996). Under persisting severe climate conditions, trees that die are usually replaced by the same species but with a more adaptive body organization to tolerate the changing climate situations (Fotelli, 2021). However, such adaptations may affect above-ground productivity and have serious ramifications for the functioning of the ecosystem (Leohle & LeBlank, 1996).

Research proves that climate change creates a rise in atmospheric temperatures and drier conditions which, in turn, cause wildfires that are responsible for 23 percent of forest degradation which is 4.8 million hectares of forest cover loss (Curtais et al., 2018). Increasing global temperatures and more prolonged and severe droughts over the past decades creates favourable wildfire conditions (Jolly et al., 2015). Rising temperatures accelerate the growth of invasive alien species which pose threats to forest trees as these invasive species alter the ecosystem functions as a result species composition changes. The quality of forest trees is diminished (Pauchard et al., 2022). Invasive alien species reduce nutrient and water availability for native species including forest trees, without adequate food and water forest trees lose their quantity and quality (Liebhold et.al., 2017).

2.1.2 Commercial Agriculture

Glover & Jones (2016) define commercial agriculture in terms of being the exact opposite of subsistence agriculture, producing for the market instead of producing for family consumption and large-scale production instead of small-scale production. Commercial agriculture uses big industrial machines while subsistence agriculture uses simple machines (Lengare, 2021). Commercial agriculture is responsible for a greater percentage of forest degradation as trees are cut to clear land for farmland, for cattle ranching and high-demand grains (FAO 2016). Livestock and cultivation are responsible for 75 percent of deforestation in Africa (Kissinger et Al. 2012). Because of the growing demand for meat, forests are cleared for the expansion of pasture. In many countries, agricultural subsidies have encouraged large-scale deforestation as they increase the profitability of agricultural production and generate pressure to expand the agricultural frontier (FAO 2016). According to FAO (2019), in 2016 the forest area in Malaysia

was 22.2 million ha, representing 67.6% of the land area. Malaysia has experienced extensive deforestation due to the up scaling of agricultural land, particularly for oil palm and rubber plantations (Abdullah and Nakagoshi, 2006).

Commercial agriculture depends on the use of artificial fertilizers which are washed into water sources by rain. The introduction of foreign individuals into water sources disturbs the ecosystem (Berezyuk, 2021). Artificial fertilizers increase the quality of nitrogen and phosphorus compounds in the water and, through the water cycle, nitric acid is mixed with clouds and forms acid rain (Tennesen, 2010). Acid rain dissolves soil nutrients such as magnesium and calcium that trees need to be healthy. It also causes the aluminium to be released into the soil. This makes it difficult for trees to take up water and without these nutrients and water, trees die (Rodríguez-Sánchez, 2020). Acid rain changes the colour of tree leaves to brown and slows down plant metabolism such as photosynthesis and chlorophyll content therefore plants are not able to generate food and they eventually die

2.1.3 Commercialization of wood

According to Njora and Yilmaz (2022), wood has different uses, from household to industrial use and this has created a huge demand for wood. Entrepreneurs saw a gap and started selling wood to people and enterprises that cannot easily access or process wood. Heimpel (2021) explains that the production of timber is another major driver (Dong 2017) of deforestation and forest degradation across the globe. It is used for a variety of products from construction and furnishing to paper and fabric goods. The food industry contributes significantly to forest degradation as the pulp and paper used to package food come from timber. On the other hand, timber is used in food processing such as smoking meat and other food products (Heimpel 2021). It is also used for construction or high end-products such as furniture and is linked to forest degradation, where valuable tree species are harvested while the rest are left behind. The degraded forests are then more likely to be targeted for deforestation and conversion to other land use (Pirard et al., 2017). The print publishing industry uses paper made from timber in newspapers, books, magazines, office paper, packaging tissues and labels.

Wood can still be sold and used in its raw state (Salim, 2016). Most wood fuel is used in its country of production, particularly in the rural areas and in developing countries, for heating and

cooking, usually on open fires or in simple cook-stoves (Schulze, 2020). Subsistence farmers often use wood to make fencing for their livestock (Umstatter, 2011).

2.1.4 Human-caused fire

Human beings cause forest fires both intentionally and unintentionally. Regardless of the intention of the cause, human-caused fire has destructive effects on forests (Wang et al., 2021). Forest fires may start accidentally when people discard ignited cigarette buds on dry grass which easily catches fire and passes it on to forest trees, leaving them in ashes (Halofsky et Al., 2020). Human beings' going on with their everyday lives can cause forest fires unaware. Their activities contribute adversely to climate change by raising atmospheric temperatures, leaving forests vulnerable to fire which destroys them (Maskova, 2018; Tedim, 2022, Jolly et al., 2015).

Setting fire to forests for the purpose of clearing them destroys existing forests and jeopardizes the development of new trees (Tedim 2022). Forest fires leave the land bare without any vegetable cover. This makes it easy for the top fertile soil to be eroded by wind and rain runoff. eroded land is not a suitable seedbed for the growth of new trees (Agbeshie et.al., 2022). Human beings usually burn forests to clear them for economic purposes such as building factories, establishing ranches and fields for cultivation (Tedim, 2022). People who stay not too far from forests may set fire to them as a way of chasing off wild animals that may be harmful to human life (Tedim, 2022). When spring approaches, people often burn dried-up grass to speed up the growth of green spring grass. Forest trees catch the fire. Once they are destroyed, trees take years to grow back and when they eventually do, their quality is diminished (Maskova, 2018).

2.1.5 Unemployment

It is in low-income countries that unemployment rates remain alarmingly high despite significant progress in reducing extreme poverty worldwide (World Bank, 2018). Productivity in such countries is low therefore they do not attract foreign investments which would, amongst many things, create employment (Rendson, 2022). The high unemployment rates in developing countries force unemployed people to depend on environmental resources for survival as they lack the monetary income to buy alternative essentials. Angelsen (2011) shares the same idea that in developing countries, environmental resources are used as the sources of energy to warm

homes and to cook, for medicinal purposes, as building materials and for traded to create a path out of poverty amongst other uses.

Unemployment is responsible for two percent of forest depletion annually in Cross River, Nigeria. Due to the high unemployment rate, graduates from the nation's tertiary institutions, see the forest as an alternative to employment in the forest-bearing communities (Punch, 2022). There is a high demand for wood because of the growth of the wood industry particularly the furniture sector. The high demand has caused a deficit of log supply and is said to be the case until a sustainable intervention is adopted (Olorunnisola, 2023). In an interview with Punch (2022) the chairman of the Cross River Forestry Commission Mr. Tony Ndiandeye explained that forests provide survival strategies for the youth. This is why it is a bit more difficult to use the policy of total ban to control forest depletion. Many young graduates have found the forest to be an alternative source of income because of high unemployment rates. The downside of this situation is that the commission is losing two percent of its forests annually (Punch 2022).

2.1.6. Poverty

According to Malerba (2020) poverty and the environment are reciprocally interconnected. People who live in poverty cause the most damage to the environment. They tend to rely on environmental resources for livelihood-making as they cannot afford other alternatives. Therefore the resources get depleted quickly (Custer & Enright, 2019). High population growth is often associated with poverty and this is seen in developing countries where the birth rate is high due to lack of family planning facilities (Nargund 2009). A high population negatively impacts the environment, especially if the majority of the population is poor; it leads to daily degradation of the environment for subsistence. It threatens the future availability of environmental resources (Custer & Enright, 2019). The World Bank (2018) reports that although measures are being taken to reduce poverty, ten percent of the world's population is very poor; It lives below the poverty line. About 735.9 million people live on less than \$1.90 per day; these are the people that are forced to survive mostly on environmental resources as their income cannot sustain their daily needs (Custer & Enright, 2019).

People that live in poverty cannot afford to visit clinical healthcare centers. They often opt for traditional medicine that is made from environmental resources such as wild animals, birds,

roots, and trees (Ahmed 2020). According to Rahman et al. (2022), For example, forest-dependent people in Bangladesh rely on medicinal plants for healthcare practices, as plant-based medicines are easily available and cost-effective. Depending on the type of tree used and the type of illness being treated, different parts of the tree are extracted to cure different illnesses. Tree parts that are often used for traditional medicine are leaves, roots and the bulk (Alamgir 2017). Although forest-dependent communities were found to utilise medicinal plants more at home than to sell at markets, forest degradation increased rapidly because the plants that they use for healthcare and cultural beliefs are often endangered species and they end up being extinct (Rahman et al. 2022).

According to Miyamoto (2022), poverty has a strong impact on forest area change while high agricultural rent accelerates deforestation. Although agricultural development boosts the economy and alleviates poverty through job creation, it threatens the quality and existence of forests. Agricultural development as a poverty reduction strategy encourages deforestation as forests were cleared to create space for oil palm cultivation (Miyamoto et al., 2014).

Due to the high poverty rate, local people venture into the craft industry which does not require a lot of capital to kick-start and to keep it running (Zhan and Walker 2019). Craft industries alleviate poverty by creating employment (Li et al., 2022). Most craft industries require little or no machinery and environmental resources as input; this makes it easier for poor people to establish small craft enterprises (Sato et Al, 2020). Forest trees are cut down for timber which is then processed into furniture, decorative crafts and other household utilities, due to the high demand for these products extraction of wood raw material has exceeded the production capacity of forests, thus diminishing the quality of forests (Fuwape, 2003).

2.2 Mitigation of Forest Degradation

The one way of curbing forest degradation is forest management. When managed sustainability, forests play a huge role in the ecosystem and climate change mitigation. According to FOA (2005), forest management is the process of planning and implementing practices for the stewardship and use of forests and other wooded land in order to achieve specific environmental, economic, social, and/or cultural objectives. This section however focuses on sustainable forest management. Sustainable forest management follows the principles of sustainable development;

It ensures that forests supply goods and services to meet both present-day and future needs and to contribute to the sustainable development of communities (Canadell & Raupach, 2008).

The first way to manage and control forest degradation is to increase the forested land area through afforestation, reforestation and forest restoration. Afforestation is defined by Ritchie and Roser (2021) as a process of planting new trees in a land area where no trees existed. Reforestation refers to the process of replanting trees where they previously existed and were destroyed by human activities or natural processes (Pennisi 2022). In simple terms, forest restoration means nursing forests back to a healthy state (Wilkie 2021). Increasing forest land area allows and accelerates the capturing and storing of atmospheric carbon dioxide, thus reducing the amount of carbon dioxide in the atmosphere. A significant reduction in the amount of carbon in the atmosphere slows down the rate of climate change and subsequently slows down environmental degradation (FAO, 2011).

Secondly, forests can be managed by reducing deforestation and forest degradation (Canadell & Raupach, 2008). Both deforestation and forest degradation reduce the volume of forested land areas. Managing fires and preventing wildfires in forests can prevent the loss of the forest land area coverage. Fire destroys existing forests and jeopardises the growth of new trees (Tedin, 2022). Forests can also be conserved by protecting them from people who cut down trees for any purpose. Such practices should be prohibited in some parts of the forested land areas (FAO, 2011).

Mitigating forest degradation by strengthening the adaptive capacity of forest-dependent communities is another way of managing forest degradation. It can be done in different ways including the introduction of alternative sources of energy to the communities that depend on fuel wood (Kohl 2009). Poverty alleviation and job creation can also help people to reduce their dependency on firewood for livelihood making as poverty and unemployment force them to trade and use fuel wood to sustain their livelihoods. Reducing people's dependency on forests reduces climate change (FAO, 2011). It is, however, important to be considerate of the poverty alleviation methods as some of them pose danger to the forests. For example, clearing forests for agricultural development as a poverty alleviation method encourages deforestation (Miyamoto 2014).

2.3 Environmental conservation policies and initiatives

2.3.1.0 Global forest conservation policies

2.3.1.1. *The Convention of Biological Diversity*

To ensure the conservation and sustainable use of forests, the Convention of Biological Diversity worked towards developing good forest governance, promoting law enforcement, and addressing forest-related trade (Dias 2012). Over two decades, the protected area coverage has doubled because of the sustainable forest management impact programme, one of the focal area investments that were established to maintain globally significant seascapes and landscapes such as forests. Prevention, control and management of invasive alien species is another focal area investment that is responsible for the growth of protected area coverage.

2.3.1.2 *The United Nations Convention to Combat Desertification*

Since forests heal dryland and prevent desertification, it was deemed important that forests be conserved so that they carry out their protective ecosystem functions properly (Gnacedje, 2012). This convention supports forest management through raising awareness and direct actions of reforestation and afforestation (Gnacadjé 2012). From 2010 to 2020 this convention has achieved a significant number of its goals which include raising people's awareness about forest conservation and climate-friendly farming techniques. Forest conservation improves forest quality and prevents the extinction of endangered tree species (Lindenmayer, 2023). Climate-friendly farming techniques such as the use of organic fertilizers improve forest quality which, in turn, reduces the risk of acid rain unlike artificial fertilizers that actually cause acid rain (Sithole et al., 2023) which disturbs plant metabolism processes (Dong, 2017).

2.3.1.3 *International Environmental Policy*

The International Environmental Policy was formulated in 1972 as a platform for different countries to come together on the issue of environmental degradation. It was carried out in stages through the conferences that focused on the prevailing environmental issues. Each conference discussed the measures that could be taken in order to save the planet from further degradation. The discussions covered environmental issues such as climate protection, sustainable energy policy, preservation of biological diversity and the conservation of forests (Gersmann, 2022). Mugadza (2021) states that the conservation of the forests is important as the forests provide

habitat and nutrition for most living organisms, including human beings and that the conservation of forests is done through sustainable forest management.

2.3.2 Regional forest conservation policies

According to SADC (2022), the Southern African Development Community acknowledges the significance of sustainable use and management of the environment in business and in the fight against social issues such as poverty and food insecurity. The declaration of the SADC Treaty of 1992 puts emphasis on the sustainable utilization of forest resources that requires good management and conservation as most SADC communities depend on agriculture and forests for livelihood making (SADC Forestry Strategy, 2020).

SADC has put in place the implementation of environmental protection programmes such the 2030 Agenda of Sustainable Development and Sustainable Development Goals. These programmes seek to encourage progress on environmental management (SADC 2022). Although some communities are forest-dependent, combating deforestation is still the key to ensuring that they practice sustainable use and management of forests according to Chapter 11 of Agenda 21 of the 2030 Agenda of Sustainable Development (SADC Forestry Strategy 2020). Sustainable Development Goal 15 aims to protect, restore and promote sustainable use of terrestrial ecosystems, to sustainably manage forests, to combat desertification and to halt and reverse land degradation and biodiversity loss. These goals can be achieved through investing in forests and forestry (Ma et al., 2022).

2.4 Summary

Each of the various causes of environmental degradation leaves a different footprint on the environment; it needs to be treated differently from others to prevent further degradation. Climate change mitigation and adaptation measures decrease the severity of environmental degradation but it does not halt it completely as people still need to use environmental resources to make a living. Global, regional, national and community-based policies are put into action to monitor and ease the pace of environmental degradation.

CHAPTER THREE

FACTORS CONTRIBUTING TO FOREST DEGRADATION IN LESOTHO

3.0 Introduction

Lesotho experiences forest degradation mainly because of the socio-economic issues such as unemployment, poverty and poor medical facilities. Other factors that contribute to forest degradation in Lesotho will be discussed in this chapter. The government of Lesotho has decided to halt forest degradation through governmental policies and initiatives. Communities are also working hard to fight forest degradation.

3.1. A Brief Background of Lesotho

Lesotho is a mountainous kingdom located in the southern part of Africa (Letsie 2015). It is, relatively, a small country with 30,355 square kilometers (km²) of land area and negligible water cover (The World Bank Group, 2021). Only ten percent of Lesotho's land area is arable land however. Most Basotho, especially those that live in the rural areas depend on agriculture for food and income creation (Legum, 2022). It is entirely landlocked within South Africa and, for that reason, its economy is very poor (The World Bank, 2008). It has been observed that the major reason why sixteen of the thirty-one landlocked developing countries are amongst the poorest countries in the world (The World Bank, 2008).

Being completely landlocked hinders Lesotho's economy development. Trade is slow due to the delays at border crossings. It is also more costly as the countries without seaports have to pay more to export their products (Miao and Wortogger, 2021). Lesotho's manufacturing industry has not matured because in the mid-apartheid era, South Africa discouraged Lesotho from participating in competing industries (Legum, 2022). With over fifty-six years of independence and a population of approximately two million (Schwitters, 2022), it is surprising that Lesotho is still underdeveloped. According to World Bank (2022), by 2017 about seventy-three percent of Basotho were living in poverty because of the negligence of the agricultural sector and the high unemployment rates in the country. The agricultural sector of Lesotho started deteriorating

in the 1990s because of the severe droughts. It has not been able to recover since then (Legum, 2022).

3.2 Causes of forest degradation in Lesotho

3.2.1 Human-caused fire

According to Asner et al. (2006), human-caused fire is a major cause of forest degradation. It is quite common in the rural areas of Lesotho where herd boys often make small fires in the fields either to warm themselves or to grill corn, these fires get out of control and spread throughout the fields and into the forests close by. In an attempt to restore grass quickly after a dry season, cattle owners often burn dry grass, which spreads vigorously and ends up burning forests. Quarrels over grazing land are common in the highlands of Lesotho (Hoag 2018). To show dissatisfaction regarding the allocation of grazing land, community members often set fire to the land allocated to the opposing villages.

3.2.2. Dependence on medicinal plants for healthcare

According to Mundail (2015), eighty percent of developing countries rely on traditional medicine for basic health care. The ingredients of traditional medicine are often environmental resources such as wild birds, animals, roots, leaves and the bark from the trees (Yuan et al., 2016). Due to the high extraction rate of medicinal plants, they face the risk of extinction (Mundail, 2015). Ndayizigiye (2022) points out that Lesotho has one of the world's poorest healthcare systems because of which people are forced to turn to traditional medicine. Although the Government of Lesotho has tried to bridge the income gap by providing free healthcare services, hospitals and clinics offering free services often run out of medicine (Scott et al., 2022). People living in the rural areas of Lesotho are forced to resort to medicinal plants for healthcare as most villages in the rural areas are far from health facilities. There are no proper roads and the walking distances are long (Satti et.al. 2012).

According to Stahlman (2015) the stigma against Sexually Transmitted Infections, including HIV, is very high in Lesotho. Due to the fear of being stigmatized, people who suffer from STIs avoid going to the clinics and use parts of trees and shrubs to treat their illnesses. *Leucosidea sericea*, *Populus × canescens* and *Rhamnus prinoides* are some of the trees/shrubs used to treat sexually transmitted infections in Lesotho (Seleteng-Kose, 2019).

3.3.3. Culture

In the rural areas of Lesotho, most people live by means of subsistence farming and use primitive methods such as cooking and heating their homes with firewood (Legum, 2022). In some parts of Lesotho's highlands, with particular reference to the Mokhotlong district, where local people believe that trees (especially pine trees) destroy the range land, they cut the trees as a way of preserving their range land and taking care of their most important commodity, livestock (UNPD 2020). Livestock is a sign of wealth in Lesotho and most people in the rural areas depend on livestock for livelihood making (Pitikoe 2018). Studies reveal that most sales of livestock are made between the months of December and January when parents prepare to pay school fees, to buy school uniforms, stationery and other necessities (Hoag, 2018). Cutting trees for firewood is a common practice in the rural areas of Lesotho (Legum, 2022). even in the capital city of Lesotho, restaurants that serve traditional meals pride themselves in using firewood for cooking as the practice is known to be part of Basotho culture (Motekase 2022). In preparation for a Basotho funeral, village men cut down tree, the village chief's permission, for firewood (Sekese, 1968).

3.2.4 Dependency on foreign aid

According to (UNPD, 2020), a study conducted in Mafeteng revealed that local people believe that poor environmental conditions attract development aid. Although receiving aid has a lot of benefits such as helping developing countries to achieve sustainable development goals, it does however have drawbacks (Abate, 2022). Developing countries that receive humanitarian aid tend to be too dependent on the aid and their economies become stagnant (Tefera and Odhiambo 2022). The residents of Mafeteng explain that their district has been deprived of development aid in the past because of their well-managed habitat. However, the local people decided to cut down some trees from the community forest and stack loads of firewood in their yards, not because they needed the firewood but to make their environment less appealing so it could attract development aid (UNPD, 2020).

3.2.4 Safety

Forests are believed to harbor criminals; therefore the local people destroy forests as a way of protecting themselves against perpetrators. Another study revealed that trees were cut down at Ha Mabote in Berea district due to the increasing crime (UNDP 2020). People passing through forests are often victimised. Perpetrators take advantage of forests and use them as cover for their unlawful activities. Rapists also take advantage of thick forests to carry out their unlawful activities. Women and young girls are often dragged into the forest where they get assaulted (Johansson et al., 2018). Sekhukhuni (2021) reports a horrific incident of a woman who was dragged into the forest in Morija where she was repeatedly assaulted sexually by three men.

Forests are natural habitats for different kinds of organisms of some of which are a threat to human lives (Steinacker et al., 2019). A Puff Adder is one of the most venomous snakes found in Lesotho that is known to cause human fatalities (Seleteng-Kose et al., 2021). Often forests are burnt down as a safety precaution to protect themselves against dangerous animals such as venomous snakes (Gutiérrez and de Miguel, 2021).

3.2.5 The Marketing of Forest Resources

Due to high level of poverty and unemployment in Lesotho, people are forced to sell forest resources in order to sustain their livelihoods (OECD 2021). Forest resources can either be sold as firewood or processed into finished products such as furniture, sculpture, kitchen utensils and other products. Parts of trees and shrubs are cut and sold by street vendors as medicine in Maseru and other busy towns (Seleteng-Kose, 2022). The high demand for firewood that is used for both domestic and commercial purposes causes a direct increase in forest degradation as more trees are cut to meet the high demand (Manyatsi and Hlophe, 2010).

3.2.6 Poverty

In 2020, an estimate of over 32% of Basotho lived below the poverty line. This means that they were living on less than US\$ 1.90 per person per day (International Monetary Fund, 2020). Most of these people depend on environmental resources for making a living as they cannot afford to buy alternative resources (Matsepe, 2015). Most poor people live in the rural areas where firewood is the main source of energy and is mainly cut from community forests

(Masekela and Semanya, 2021). The rural poor cannot afford processed timber for roofing so they opt for tree trunks and straw (Matsepe ,2015). Satti et al. (2012) add that the rural poor depend on the use of traditional medicine which is often made from roots of trees and other plants. Poverty is a major source of forest degradation because the poor depend on forest resources for survival as they have limited options (Meher 2023)

3.2.7 Unemployment

Like other developing countries, Lesotho is experiencing high levels of unemployment which is expected to rise higher due to the economic crisis caused by the Covid-19 pandemic (Shi et al., 2022). In 2022 Lesotho witnessed unemployment levels of 24.6% (The World Bank 2023). Due to high unemployment levels, the youth are developing an interest in entrepreneurship (OECD 2021). Entrepreneurs establish businesses that require less capital because they have only a few savings and limited collateral access to loans (OECD, 2021). Because of the high level of unemployment and affordable access to forest resources, many people turn to firewood selling as a source of income (Manyatsi and Hlophe, 2010).

Due to the high levels of unemployment in Lesotho, most Lesotho residents live in poverty and are forced to resort to forest resources to make a living as they cannot afford to by alternative resources (International Monetary Fund, 2020). They use firewood for cooking and heating their homes (Masekela and Semanya, 2021). They use traditional medicine (Satti et al., 2012), tree trunks (as furniture) (Showers, 2010) as well as construction material (Manyatsi and Hlophe, 2010). The marketing and use of forest resources encourage an increased rate of forest degradation (Manyatsi and Hlophe, 2010).

3.3 Environmental degradation mitigation in Lesotho

3.3.1. GOVERNMENTAL ENVIRONMENTAL CONSERVATION POLICY (LESOTHO)

3.3.1.1 *National Environmental Action Policy*

This National Environmental Action Policy was formulated in June 1989 with the intention to provide a framework for incorporating environmental considerations into the nation's economic development plan. Environmental concerns of the highest priority are identified and specific mitigation measures for such concerns are considered. The main environmental problems that

were to be tackled were pollution, over-grazing, soil erosion, soil fertility loss, and the use of toxic agricultural chemicals. The basic principles of this policy include adhering to sustainable use of environmental resources and taking into consideration the conservation of cultural heritage. People who do not adhere to the principles of the policy receive a fine.

3.3.1.2 National Action Plan 1994

This plan was formulated in May 1994 to implement agenda 21 of the National Environmental Action Plan. The NAP is built on the foundations of the NEAP and will incorporate sectoral priorities and national plans for implementing international conventions on Biodiversity, Climate Change and Desertification Control. The goal of the National Action Plan was to protect and conserve the environment with the view to achieve sustainable development for Lesotho. In order to achieve this goal, 16 objectives were set; some of them are sustainable use of natural resources and slowing down environmental degradation (UNCCD Lesotho, NAP 2015).

3.3.1.3. Lesotho Forest Act 1998

According to Gazette No.91 (1998), this act was established to regulate and control some dealings in forest resources and the sustainable management of the forests and forest reserves. A forest fund was created and its proceeds were reserved for sustainable forest management and forest research for the improvement of forest quality. The chief forestry officer and other officers were appointed to ensure proper maintenance, control and the management of the forests. For instance, if a forestry officer came across a dying tree that might spread disease to other trees. It is their duty to cut it off. To control the excessive extraction of forest resources, the quantity of forest produce which may be removed by a license, the method of removal, and the season or times during which the forest produce may be removed are determined by the Forestry Division and stated in the license (Gazette NO.91 1998). According to this act, forest fires are forbidden and the responsible person for starting one has to pay a fine for damage caused.

3.3.1.4. National Tree Planting Day

March 21st was declared a holiday for tree planting in Lesotho. This holiday was inspired by the first European missionaries who came to Lesotho and taught Basotho how to plant trees (UNDP, 2020). As time went on, this day was no longer recognized as a holiday, therefore, less trees were planted as community members could not attend tree planting ceremonies because of work commitments (Bohloa, 2021). As part of celebrating national tree planting day, communities are educated about the best ways of conserving forests and other natural resources (UNDP, 2020).

According to Standard Lesotho Bank, (2022) in March 2020 big corporations such as Standard Lesotho Bank, Metropolitan and Vodacom contributed towards making the National tree planting day a success where 100 000 were distributed equally amongst the ten districts of Lesotho. Ten thousand trees were planted in each district. Standard Lesotho Bank alone pledged to donate 200 000 trees annually for the period of three years to make the national tree planting day initiative a success (Standard Lesotho Bank, 2020). To emphasize the importance of tree planting, the Prime Minister of Lesotho, Mr. Samuel Ntsokoane Matekane took part in the national tree planting day ceremony held at Thabana-Morena in Mafeteng district on 21st March 2023. He emphasised the importance of trees in combating global warming (APO Group 2023).

3.3.2 community-based environmental conservation policies

Community-based conservation projects protect common property resources such as forests, because these resources are easily accessible to the public. They can easily get depleted (Smith 1981). Shale and Rants'o (2019) highlight the importance of community-based projects by making reference to the Tšenekeng Botanical Garden which was established by the community members of Tšenekeng with the aid of a Non-Governmental Organisation known as Serumula Development Association. The garden was established to protect endangered plant species such as aloe vera as they were being extracted rapidly by community members who use them for food, medicine and other purposes.

3.4 Summary

Since marketing and the use of forest resources sustains human life, they cannot be prohibited even though they cause forest degradation. Conservation policies and initiatives that promote sustainable use of forest resources are put into place to slow down forest degradation. The planting of trees is encouraged at the national level to ensure that forests do not die completely.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.0. Introduction

Research methodology comprises procedures and methods used to carry out research studies. It entails a plan of how the research study was carried out and the methods/techniques used. Population and sampling are also components of research methodology. When the population is too large, a sample is selected. An appropriate sampling technique has to be used to avoid bias. Data collection and the procedure of data collection as well as data analysis and presentation also form part of the methodology. The principles that guide research should be observed.

4.1. Research Paradigm

Research paradigm refers to a framework that is experience-based and action-oriented. The purpose of research is to help people to address the issues of dealing with how they experience and come to know the world in a practical sense (Kaushik & Walsh, 2019). It shapes the approach that is used when conducting a research study. By aligning the research paradigm with the research question, the researcher gains a stable foundation and structure enabling her to carry out the research study systematically. The most suitable research paradigm for this study is the pragmatic paradigm. This research study is based on a mixed-method approach.

4.2. Research Methodology

Research methodology is defined by Patel and Patel (2019) as a systematic process of solving a research problem scientifically. Lgwenagu (2016) defines research methodology as the theoretical and systematic analysis of the methods that are applied to the respective field of study. Research methodology explains how the research study was carried out by offering a step-by-step outline of the research process. It offers detailed information on what methods were used to gather the study data, why such methods were chosen and what their limitations are. The research methodology section in this study covers the research paradigm, research methods, research design, population, selection sample, research instruments, data collection and presentation, validity and reliability as well as ethical considerations.

4.3. Research Design

Research design is a strategy for answering one's research questions using empirical data (Bhandari, 2023). However, Kothari (2004) defines a research design as an inquiry structure that deals with logical rather than logistical matters. According to Williman (2001), a research design ensures that the evidence obtained enables a researcher to answer the initial question as unambiguously as possible. Research designs reflect the purpose of the inquiry, which can be characterized as exploration, description, explanation, predictions and evaluation history. A research design must be strategic to ensure that methods match research objectives and that the right kind of analysis data is used (Bhandari, 2023).

This study used correlation design because it has two variables that have a relationship. One variable is dependent on the other. Livelihood-making is the dependent variable while environmental resources are regarded as independent. They have a negative correlation because variables change in opposite directions.

4.5. Population and Sampling

Population refers to any group of human beings or non-human entities such as objects with specific characteristics (Taherdoost, 2016). Banerjee and Chaudhury (2010) define population as all items that have a common trait or traits in any field of inquiry. The items can be human or non-human and should have similar characteristics that relate to the study. Studies are usually conducted on samples because it is impossible to study the entire population especially if the population is excessively large. Conclusions drawn from samples are intended to be generalized to the population.

According to Taherdoost (2016), a sample is a selected group of some elements from the totality of the population. The sample must therefore be representative of the population. This means that sample selection should not be biased. There are different types of sampling techniques used to ensure that the sample represents the entire population. Although non-probability sampling saves time and resources by selecting a sample that is easily accessible it may however give a false representation of the population. Non-probability sampling, specifically convenience sampling, is most at risk for sampling bias because, with this type of sampling, some members of the population are more likely to be included than others (Simkus 2023). Probability sampling

techniques afford the population objects equal chances of being selected. Selecting a fairly large sample will reduce the chances of having a biased sample. The sample size should be adequate, neither too large nor too small (Andrade, 2020). A large sample becomes expensive and time-consuming while a small sample may affect the truthfulness of the results.

The population in this study was made up of forty-two people who sell firewood from the villages in Roma. Since the population was unknown, sampling was ruled out to avoid having too few participants.

4.6. Research instruments

Research instruments are tools that a researcher uses to collect data (Bastos et al., 2014). Questionnaires and a phone camera were used as research instruments in this research study. The questionnaires were used when interviewing the participants and the phone camera was used to capture images of the forest conditions and equipment used to cut trees.

4.7. Data collection procedure

This research study consists of two types of data, primary data and secondary data and both are collected differently.

4.7.1. Primary data collection procedures

According to Ajayi (2017), primary data is data that is collected for the first time by the researcher and it happens to be in its original mode. It has not been tampered with; thus it is regarded as most reliable when carried out precariously. Primary data is often collected through interviews, surveys, questionnaires, experiments and observation. Primary data is used to answer research questions (Ajayi 2017). Primary data is up-to-date because it is collected during the research process and thus can be used to update secondary data sources. Primary data is always specific to the researcher's needs because the research study is involved in the data collection procedure. Collecting primary data is quite expensive and time-consuming because it requires traveling.

Interviews were conducted face-to-face and some through phone calls as some of the respondents were not able to attend face-to-face interviews because of work commitments. The interviews were guided by questionnaires the researcher had prepared prior to the data collection

date. Observation was also used by the researcher to collect data, the researcher watched as the woodcutters cut down trees and chopped them into smaller logs of wood in the forest located behind the St. Joseph's hospital yard while observations, pictures and videos were taken.

4.7.2. Secondary data collection procedures

Secondary data refers to the data that has previously been collected and is accessible to other researchers (Sindin 2017). Secondary data is collected through sources such as journal articles, books, government publications, and websites. Secondary data is the data that was collected for a previous research study. It may be outdated as things change over time. Secondary data is broad and therefore not specific to the researcher's needs. Secondary data collection is economical and less time-consuming as it does not require the researcher to travel.

This research study used secondary data collected from online sources such as journal articles, newspaper articles and E-books.

4.8. Data Presentation Procedure

Data presentation refers to the process of comparing two or more sets of data. Well-presented data is easy and comfortable to understand (Babajide 2022). It can be presented in three ways: textual, tabular and diagrammatic. Textual presentation is used for explanatory or descriptive data and can only be presented in words or paragraphs. The tabular presentation can be used for both qualitative and quantitative data to classify it in rows and columns according to its characteristics or traits. The convenience of using tabular presentation is that it makes viewing and comparison of data easy. Diagrammatic presentation makes use of images such as charts, graphs, pictures and maps to display the data.

In this research study, three types of data presentation methods were used: diagrammatic, tabular and textual. Diagrammatic presentation in the form of graphs was used to display data sets that describe the participants' demographic information and other data sets that did not require long explanations. Other data sets were presented in textual form.

4.9. Validity and reliability/ trustworthiness and credibility

Validity and reliability are concepts used to evaluate the quality of research to avoid bias and untruthful results (Middleton 2023). When observed with precaution, the research study is carried out consistently and therefore the results become accurate. Using different research methods for the same set of data may imply the accuracy of results. Even though in this research some participants were interviewed face-to-face while others were interviewed through telephone due to unavailability, the same set of questions was asked and the interviewer could pick up the tone of the interviewee on the phone.

Credibility is a measure of the truthfulness of the research's findings and whether they are congruent with reality. One way of measuring pursuing the research findings' credibility is by involving informants in verifying researchers' interpretations after the fact, this has often been called member checking (Stahl & King 2020). In this research study, an expanded literature review and the entire population were used as a form of member checking therefore this research has been checked for trustworthiness.

4.10. Ethical consideration

Bhandari (2020) defines ethical considerations as a collection of the rules that guide a research design and procedures. Researchers have to abide by those rules at all cost. These rules protect the rights and promote the safety of participants. They also intensify research validity and sustain scientific and academic integrity.

This study was subjected to certain ethical considerations. In research, voluntary participation should be awarded to participants, allowing them to opt-in or out of the research study at any time. The participants should not feel forced to participate and continue participating in the study. Before continuing with the interview, the researcher introduced herself to the participants and asked for their permission to interview them. The researcher made sure that the participants were aware of the purpose of the interview, giving them informed consent. Honesty as an ethical consideration was also taken into consideration in this study. Some of the participants thought that they would reap financial benefits from participating in the research study. However, the researcher told them that the study was conducted for academic purposes.

4.11. Summary

To achieve accurate results and enhance the quality of the research study, the correct methodology should be chosen and executed properly. Carrying out the methodology properly reduces the chances of violating the rights of the respondents and putting their lives in danger.

CHAPTER FIVE

FIREWOOD TRADING AS A LIVELIHOOD STRATEGY AMONG RURAL RESIDENTS IN ROMA

5.0. Introduction

This chapter attempts to investigate the contribution of firewood marketing to the improvement of the livelihoods of people. The firewood traders in the Roma community are mostly young men who are trying to make a living for themselves and their families. Poverty, low levels of education and unemployment have forced people to turn to firewood trading as a way of making a living.

5.1. Demographic information of the firewood sellers

This section presents the demographic information of the firewood traders. The discussion focuses on gender, age, education levels, number of household members, number of employed household members, and employment sectors of the other employed household members.

5.1.1. Gender Identities of firewood traders

The gender identities of firewood traders are crucial in this study because they provide an idea of the type of people who trade in firewood for household maintenance. Although jobs are not associated with gender, there are activities that are performed better by a particular gender than the other. Over the years, gender bias has decreased but gender stereotypes continue to limit women's career opportunities by making women less comfortable in some career fields (Tabassum & Nayak 2021). It is therefore important for this study to look into the gender of the firewood traders. The gender of people who trade in firewood are presented in Table 5.1 below.

Table 5.1: Gender of the firewood traders in Roma, May- June 2023

Gender of Firewood Traders	Frequency	Percentage
Male	34	81
Female	8	19
Other	0	0
Total	42	100

Source: Field data

As shown in Table 5.1, about 81% of the firewood traders are men, while women make 19%. The gender disparity in the frequency between men and women in the firewood business can be

linked to different factors. Firstly, cutting down trees for firewood is laborious and requires physical power. Men have more physical strength compared to women. Studies reveal that the muscle strength of women is typically reported in the ranges from 40 to 75% less than that of men (Bartolomie et al., 2020). Cutting firewood with a hand saw and carrying tree trunks on the shoulders requires some physical strength. These results suggest that the physical ability of one to cut and carry large trees counts in this type of business.

Secondly, the increasing unemployment rate in the country has forced people to perform different activities to make a living. Studies show that the national unemployment rate was estimated at 22.5% in 2019 and more than half (53%) of the unemployed Basotho are male (Lesotho Bureau of Statistics, 2023). The increasing unemployment among the male people in Lesotho is associated with the retrenchment of Basotho men from the South African mines. For a long time, the mines were the main employers of Basotho men, but this is no longer the case; females also have to find alternative means of living.

Thirdly, according to the traditional cultural practices, men are heads of households. The literature indicates that men follow the traditional male provider model where they see themselves as financial providers whose families depend on (Hoherz & Bryan, 2020). It is their responsibility to see that members of their households meet their basic needs such as food, clothing and others. So, the male people participate in firewood selling to maintain their households. It can be inferred from the above results that male people can perform any type of work to see that their families get access to food and other necessities.

5.1.2. Age categories of firewood traders

Age plays an important role in different activities. Young people are considered to be brisk compared to the elderly ones (World Bank 2008). This means that young people perform some tasks more quickly than elderly people. Table 5.2 presents the age groups that participate in firewood trading.

Table 5.2: Age categories of firewood traders in Roma, May- June 2023.

Age categories of firewood traders(years)	Frequency	Percentage
Younger than 18	0	0
18 – 30	16	38
31 -39	12	28
40 - 49	10	24
50 – 59	0	0
60 and above	4	10
Total	42	100

Source: Field data

It is observed from Table 5.2 that the majority (38%) of firewood traders are between 18-35 years of age. These figures suggest that youth unemployment is very high in Lesotho. According to *Lesotho Bureau of Statistics* (2023), youth unemployment was estimated at 29.1% in 2019 for both educated and less educated people. When young people cannot find paid employment in the public sector, they resort to alternative income-generating activities to make a living. While some studies show that youth are found in small numbers in the agricultural sector, this study reveals that there are many young people in firewood trading which provides quick cash. It is unlike farming where one expects the returns after harvest (between 3 and 6 months after sowing). Cutting down trees for firewood does not need a long waiting period. In addition, the firewood market is readily available from the local buyers, especially those grilling meat at local butcheries.

Table 5.2 suggests that a few adults (10%) aged between 40 – 49 are also involved in firewood selling. As discussed in the previous section, tree-cutting needs energetic people and most adults have lost their strength. This is why adults are not found in large numbers in firewood trading.

5.1.3. Marital Status of firewood traders

Marital status was considered important in this study. Married people need to provide for their families. Table 5.3 presents data about the marital status of the firewood traders.

Table 5.3: Marital Statuses of firewood traders in Roma, May-June 2023.

Marital status	Frequency	Percentage
Single	30	24
Married	10	72
Divorced	0	0
Separated	2	4
Widowed	0	0
Total	42	100

Source: Field data

According to Table 5.3, married people make the highest percentage (72%) of people trading in firewood possibly because they prefer to work closer to home so that they can spend time with their families. The activities associated with trading firewood are often within walking distance. They do not require much travelling or migrating. In addition, they need to provide for their children. Secondly, having the means of income generation contributes to the success of a marriage and married people may sell firewood to generate income to maintain healthy marriages. According to Lin & Brown (2021), wealth increases marriage formation and reduces divorce risk. Thirdly, married people need the means of income in order to afford the costs associated with setting up a household and supporting each other.

About 4% of the firewood traders are separated; separation and divorce are not common in semi-rural and rural areas of Lesotho. In most cultures, separation and divorce are considered as signals of failure to maintain a marriage and are associated with selfishness (Jalili et al., 2017).

5.1.4. Size of Firewood Traders' households

The size of the household trader's household has a direct impact on the amount of money spent to support the family. The number of people in the firewood sellers' households is presented in Table 5.4.

Table 5.4: Number of household members in the homes of firewood traders in Roma, May-June 2023.

Number of household members	Frequency	Percentage
1 – 2	8	19
3 – 4	18	43
5 – 6	10	24

More than 6	6	14
Total	42	100

Source: Field data

It can be observed from Table 5.4 that the majority (43%) of the firewood traders live in households of 3–4 members. Firewood traders tend to have small families. Although the number of household members determines the availability of labour for different activities, it also has a negative impact on consumption. The returns from firewood selling are used to purchase the basic needs. When the children are not at school, they cut the trees and arrange the firewood into desired loads.

As observed from Table 5.3, a small number (14%) of the firewood traders have more than six members in their households. People do not have large families anymore because of the high cost of living. According to Mokati et al. (2022), the average family size worldwide is four members. Those that have larger families are forced to do odd jobs like selling firewood to support their families.

5.1.5. Level of education

The firewood sellers' educational levels are included in this study because under normal circumstances, one's job is determined by one's level of education. Bonnie et al. (2015) report that attaining good education leads to stable jobs, higher earnings and better working conditions. Table 5.5 presents the education level of the firewood traders.

Table 5.5 Educational level of firewood traders in Roma, May- June 2023.

Level of Education	Frequency	Percentage
None	6	14
Primary	18	43
Secondary	10	24
High school	7	17
College	1	2
University	0	0
Other	0	0
Total	42	100

Source: Field data

Table 5.5 shows that most firewood traders (43%) have primary school education. These results suggest that it is not easy for people with primary school education to secure employment in the country. In this case, they find firewood trading as the option to earn some income. Despite their low level of education, Powell & Moser (2019) argue that, primary school education equips learners with basic skills such as counting, reading, and writing. Completing primary school level of education also increases one’s environmental understanding. Knowing about the environment and how it functions enables humans to use it as a means of livelihood-making.

A few (2%) firewood traders have tertiary education. According to Table 5.5, one firewood trader has attended school up to the college level. The reason may be that college graduates prefer stable high end jobs (Zhang et Al. 2022). Firewood trading cannot be considered a stable source of income because the world is shifting to more environmentally friendly fuels and soon firewood trading may have to come to a halt.

5.1.6. Number of working people in the firewood traders’ households

It is important to know the number of household members that are employed. This may determine whether the household depends solely on the income generated from firewood sales or whether there are other means of income. The findings on this matter are presented in Table 5.6.

Table 5.6: Number of employed members in the households of firewood trader in Roma, May-June 2023.

Number of working household members	Frequency	Percentage
1	20	48
2	16	38
3	6	14
4	0	0
More than 5	0	0
Total	42	100

Source: Field data

It can be noted from Table 5.6 that 48% of the firewood traders do not have other members of the households working elsewhere. These households depend on income from firewood sales. Many people in Lesotho are faced with lack of employment. As a result, there is increasing poverty caused by lack of income. The income derived from firewood selling reduces their food insecurity that is very high among rural households.

These quantitative findings also suggest that a small percentage (38%) of firewood traders has some members of their households employed in other income generating activities. Some household members are employed in different income generating activities. This means that a few traders have supporting hand for the maintenance of their households. The incomes derived from both firewood trading and other income generating activities are used to cater for the needs of the households. It can be argued that the income obtained from informal activities is too little and fails to cater for the household needs.

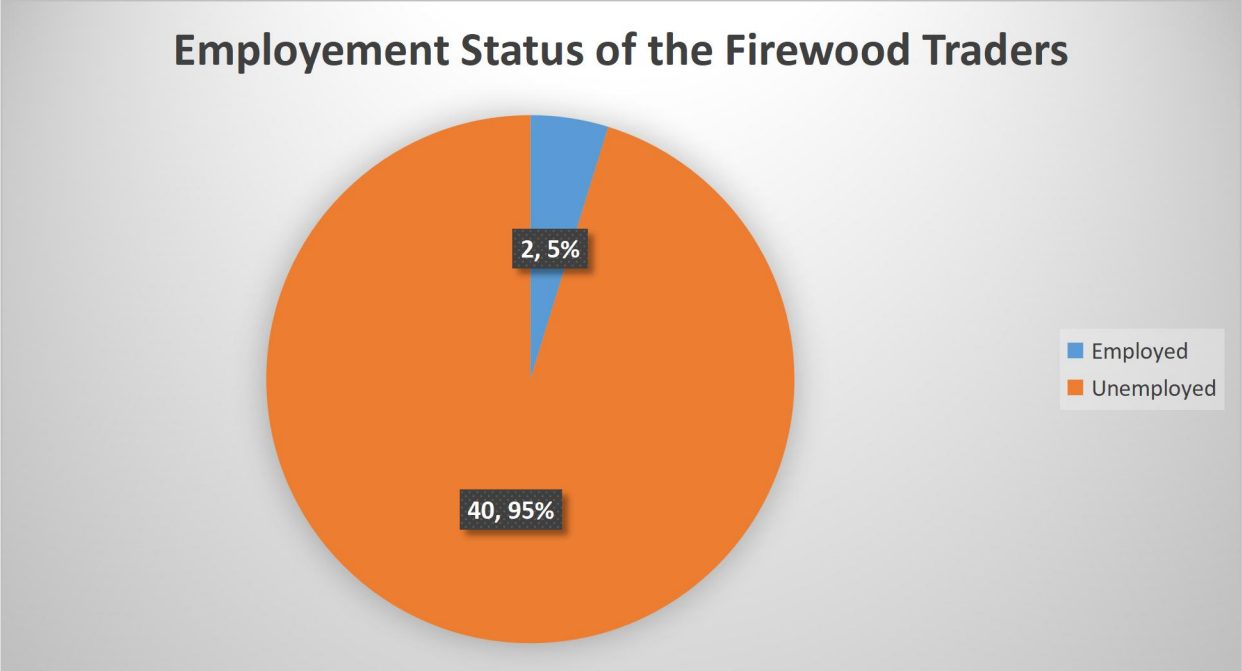
5.2. Livelihood-Making Strategies for the Firewood Traders

This section is about the livelihood-making strategies of firewood traders. It explores strategies that the firewood traders use to make a living besides selling firewood, how such strategies are relevant and whether they are efficient.

5.2.1. Employment status of the firewood Traders

The employment status of the firewood traders was considered an important factor in the establishment of firewood trading. Some firewood traders might be employed in other activities while others might be focusing on firewood trading only. Behrenz et al. (2016) observe that unemployment forces people to start businesses in order to sustain their daily needs.

Figure 5.1 Employment Status of firewood traders, May – June 2023



Source: field data

As observed in Figure 5.1, 5% of the firewood traders are employed in other income generating activities while the majority (95%) are engaged only in firewood trading as a way of making a living. Unemployment is one of the most negative issues in developing countries including Lesotho. Studies show that the unemployment rate in Lesotho was estimated to be 22.5% in 2019 (Bureau of Statistics 2023). Unemployment is higher in the rural and semi-rural areas such as Roma. The possibility of employment is higher in urban areas where there are more industries and other facilities that promote economic activities. Unemployed people find other ways of making a living, they establish businesses using readily available resources such as forest trees. Two firewood traders are employed in some other income generating activities. One is a caregiver at a private student accommodation facility while the other is a gardener. Their earnings are not sufficient for their needs. This is why they started selling firewood.

5.3.2. Reasons for trading in firewood

Firewood traders have different reasons for selling firewood. Poverty alleviation and food security were the main reasons. Food insecurity and poverty rates are alarmingly high in Lesotho therefore people apply different strategies to alleviate poverty and to secure their next meals. Firewood trading became a popular poverty alleviation strategy in Roma because no starting

capital is required. They either get free trees from the forest or take them from tree sellers and pay when they have made sales.

5.2.2.1 Main sources of income for the firewood traders

Identifying the firewood traders' main source of income is important in this study because it shows how important firewood trading is to the traders. A main source of income is a source of income that makes up the largest portion of the individual/household/organization's total income.

Table 5.8: Main source of income for firewood traders in Roma, May-June 2023

Main source of income for the firewood traders	Frequency	Percentage
Firewood Trading	34	81
Piece/part time jobs	16	15
Furniture Manufacturing	1	2
Small retail business	1	2
Total	42	100

Source: Field data

Table 5.8 shows that for the majority (81%) of the firewood traders, firewood trading is the main source of income. Firewood trading is time-consuming. Traders go to the forest to cut trees and then go back to where they have packed the firewood to wait for customers. There is usually no prior communication between the traders and the customers. The customers show up when they need firewood and choose the trader with the best quality of firewood. The firewood trader has to always be on site in case customers come, this prohibits them from focusing on other sources of income unless they have someone who can help.

5.3. Firewood Supply

This section is about the firewood supply, it entails the places where the firewood is sourced, how it is extracted and laws and rules governing the extraction of firewood.

5.3.1 Forests Ownership

Forests can be on communal land, privately owned land or other types of land ownership and each type has different management and laws therefore the type of land on which the trees are grown is important in this study. Table 5.9 shows the type of land where the firewood traders get trees for firewood.

Table 5.9: type of land when firewood traders get trees in Roma, May-June 2023.

Type of Land Where Firewood Traders Get Trees for Firewood	Frequency	Percentage
Communal Land	34	81
Private Land	8	19
Total	42	100

Source: Field Data

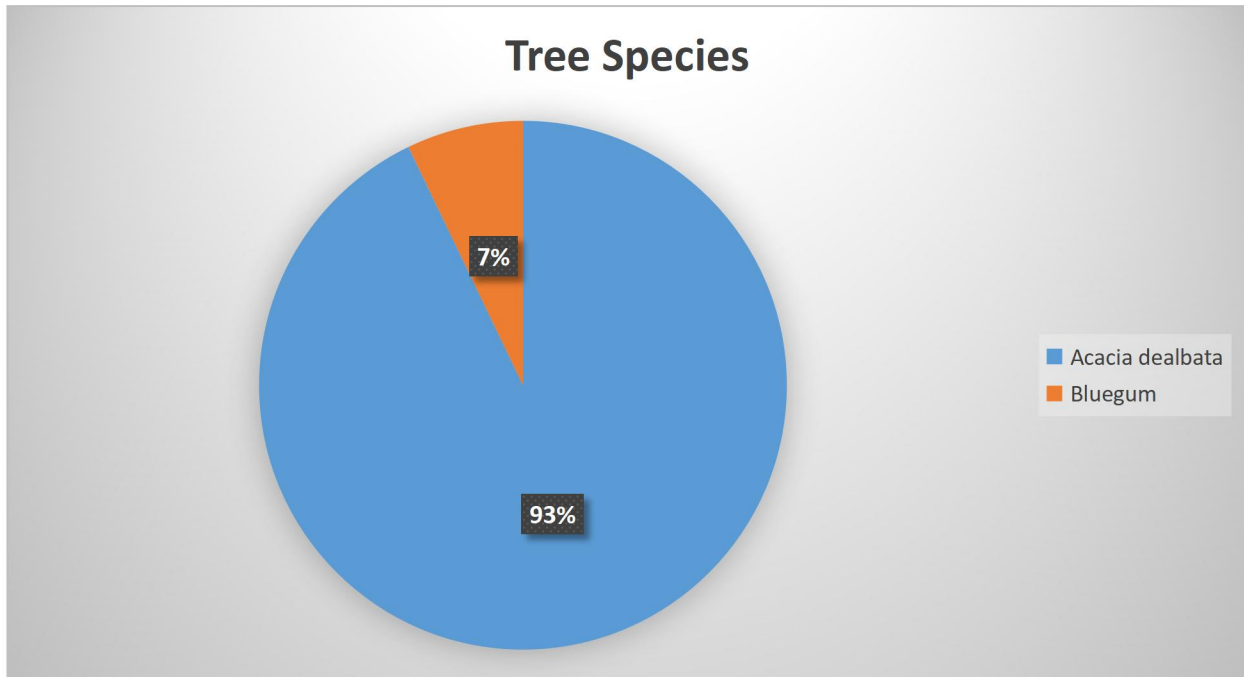
According to Table 5.9, the majority (81%) of the firewood traders source trees from communal land. Cutting trees from communal land is easier because traders only seek permission from the village chief once and there is no limit to the number of trees they cut. They can only be limited by their physical strength and the demand for firewood. Trees from communal land are obtained free of charge; traders do not pay for them.

The remaining 19% of traders cut trees from privately owned forests. The downside of getting trees from privately owned forests is that the firewood traders pay for each tree trunk they cut and that decreases their total income. The price of a single tree ranges from M50.00 up to over M1 000.00, depending on the size and type of the tree. The firewood traders pay for the trees after they have made sales from firewood.

5.3.2 Tree Species Preference

It is important to look into the tree species that are preferred by the firewood traders because some trees take longer than others to replicate and it is not advisable to cut trees that replicate slowly. The customers also have an influence of the type of trees that are sold because there are trees that are best suited for the purpose that they are bought. Figure 5.2 illustrates the type of trees that the traders sell and that the customers prefer.

Figure 5.2: Tree Species that are preferred by Firewood Traders, May–June 2023



Source: Field Data

Figure 5.2 suggests that the majority of the firewood traders (93%) prefer to sell acacia deal bata because it is available in large quantities and it is also preferred by most customers. The customers prefer it over other species because it takes less effort to light and it produces odourless smoke that does not interfere with the scent of the grilled meat. The few firewood traders that cut acacia deal bata mention that their customers like it because it grows thicker and burns longer and more slowly than other species, Thus it burns slower and hotter, making it perfect for heating purposes.

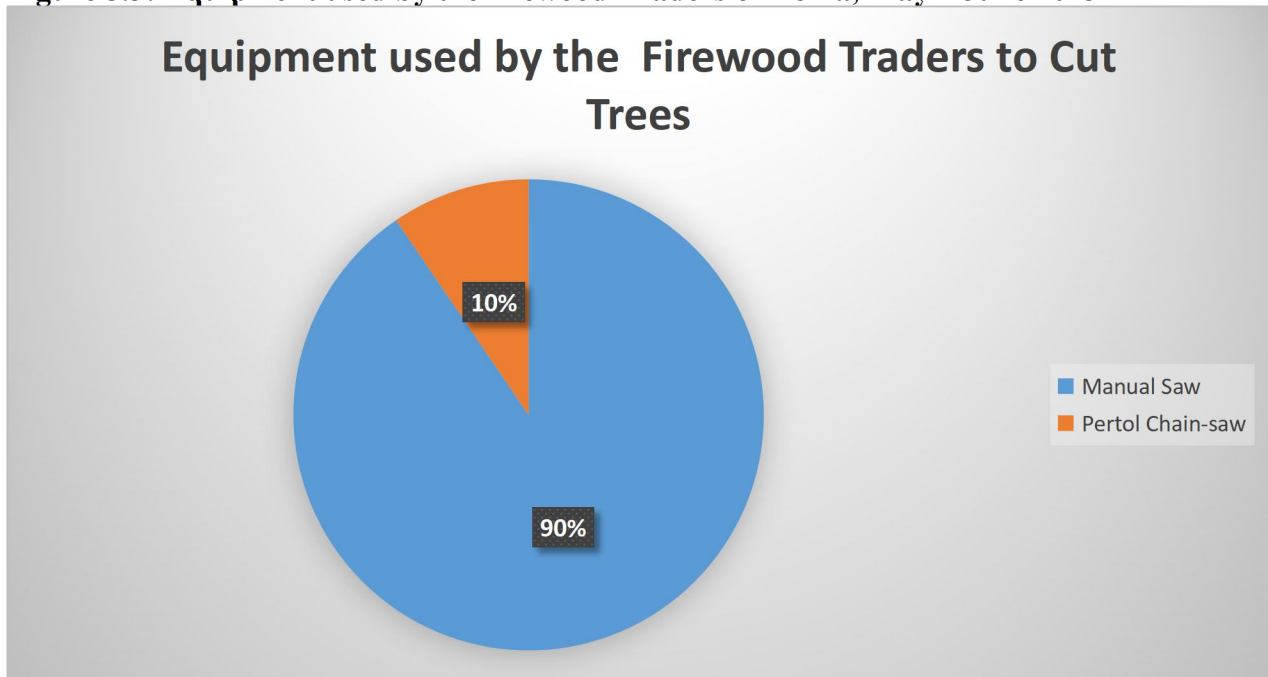
5.4. Technology Used for Cutting Trees

This section is about the technology used by the firewood traders of Roma to cut trees. It looks into the type of tool used by the firewood traders, why they prefer the tools they use, and their efficiency.

5.4.1 Equipment used to cut trees

It is important to look into the type of equipment used by the firewood traders because it affects the rate of production and determines how rich the trader is; equipment differs in price. According to Chen et al. (2019), the more advanced the equipment is, the higher it costs. Figure 5.3 represents the type of equipment used by the firewood traders.

Figure 5.3: Equipment used by the firewood Traders of Roma, May – June 2023



Source: Field Data

As shown in Figure 5.3, a greater percentage (90%) of the firewood traders in Roma use manual saws to cut trees. This is because manual saws are more affordable to buy and easier to use; they do not require fuel. The majority of the firewood traders are poor and cannot afford to buy expensive equipment and fuel. Manual saws are effective and speed up work for firewood traders specializing with acacia deal bata trees because they are not too thick. The blades of the manual saw become blunt over time, therefore it takes longer to cut a tree with an old saw with blunt blades. Sometimes the traders do not have money to buy new blades and they are stuck with the blunt ones that are time-consuming.

Ten per cent of the firewood traders use petrol chain-saw, possibly because they target thick trees that take a long time to cut with a manual saw. Although some of the firewood traders

were able to afford to purchase petrol chain saws, they complain about the steep price of petrol that keeps on rising. Russia's invasion of Ukraine has inflated fuel prices, causing a sharp fuel increase of over \$110.00 per barrel (Bagchi & Biswajit, 2023).

5.5. Transportation for Firewood to Customers

All (100%) of firewood traders in Roma explained that the customers are responsible for firewood delivery. None of them transports the firewood to the customers. One of the reasons is that they do not have vehicles that can carry loads of firewood to the customers. Another reason is that there is often no communication between them and their customers so arranging for transport would be an issue. Lastly, transport costs would increase the price of the firewood and they prefer keeping the prices as low as possible to attract customers.

When customers collect the firewood, they often come with vans to load the firewood. When they buy many loads of firewood, they bring trucks which have bigger truckbeds.

5.6. Marketing of Firewood

This section focuses on the marketing of firewood in Roma. It entails discussions about the customers who buy firewood, different advertisement methods used by the firewood traders, the firewood demand rate, and firewood pricing.

5.6.1. Customers' profile

The firewood traders reported that they market firewood to butcheries and individuals that use firewood for different purposes. The customers come from Roma, Maseru, Thaba-Tseka, and Semonkong. According to Mongabay (2019) in 2010 Thaba-Tseka had 284ha of forest cover and lost more than 130 ha of forest cover in a period of three years, from 2010 to 2013. And for this reason, firewood is scarce in Thaba-Tseka. The customers use the firewood for both industrial and domestic purposes. It is used in the food industry, where meat is grilled on open fire. In the homes, the firewood is used for cooking and warming up the homes during the cold weather.

5.6.2. Advertising

Identifying the methods of advertising used by the firewood traders is important in this study because it provides an estimate of the number of potential customers that know about the product.

According to Aiolfi et al. (2021), advertising increases customers reach and more people get to know about the existence and availability of the advertised product.

Table 5.10: method of advertising used by the firewood traders in Roma, May-June 2023

Method of Advertising Used by Firewood Traders in Roma	Frequency	Percentage
Display	38	94
Word of Mouth	1	3
Media	1	3
Total	42	100

Source: Field Data

According to Table 5.10, the majority (94%) of the firewood traders display stacks of firewood along the roadside in elevated places such as mountain tops, and outside the firewood traders' yards. Displaying the firewood as a way of advertising does not have advertising costs so it keeps the selling price to a minimum. In addition, when firewood is displayed, customers get to see the actual product that they are buying.

Very few firewood traders advertise through the media and word of mouth. Three percent of the firewood traders in Roma advertise through the media and another 3% advertise through word of mouth. The latter is time-consuming. Advertisements take longer to reach potential clients as the trader has to travel and let individuals and organisations know about the product. According to Mooney (2023), word-of-mouth advertising spreads slowly and reaches a limited number of potential clients; it takes a lot of time for the entrepreneur and the employees to tell people about their product. Media adverts are not popular among the firewood trader of Roma because it has additional costs and the aim is to keep costs to a minimum in order to attract and keep the customers. Media advertising increases the cost of the product forcing the entrepreneur to increase the selling price (Odediran, 2020).

5.6.3. Market Demand

For any business, it is important to determine the demand of the product in order to prepare the entrepreneur; The demand rate directly impacts the business returns; hence it is important to review the rate of market demand in this study. Ogura & Tsuda (2019) explain that gross profit

increases and decreases in response to the market demand, when the market demand is high, the gross profit increases but when the market demand is low, the gross profit decreases.

Table 5.11: Firewood market demand in Roma, May – June 2023.

Firewood market demand	Frequency	Percentage
High	0	0
Low	38	90
Seasonal	4	10
Total	42	100

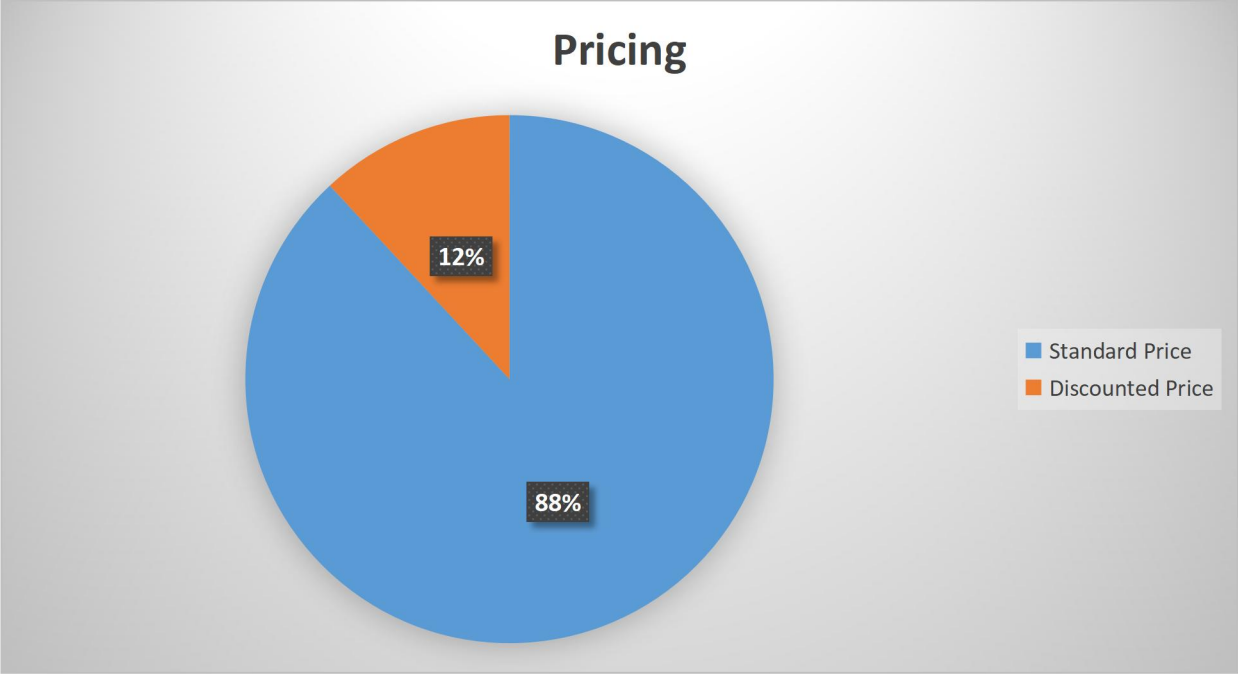
Source: field Data

Table 5.11 suggests that the firewood market demand in Roma is very low. In this regard, the data shows that 90% of the firewood traders have a low market demand that decreases their profit. They explained that it gets slower when the university terms close. University students are the majority supporters of the butcheries that sell grilled meat near the university and the butcheries get firewood from the firewood traders. The other firewood traders that sell to individuals for domestic purposes stated that market demand slightly increases high in winter which is only three months in a year and low for the rest of the year. Generally, the market demand for firewood is low.

5.6.4. Pricing

The pricing of the firewood is important in this study because it influences the income made by the firewood traders. The set price affects the profit margin per unit sold. Although pricing is not the only factor that affects the total profit, it has a direct impact on profit. Higher prices lead to high profits.

Figure 5.4 : Firewood Pricing followed by the Firewood Traders in Roma, May- June 2023.



Source: Field Data

Figure 5.4 suggests that 88% of the firewood traders in Roma sell a load of firewood for M300.00, which is the price that has been agreed upon by the traders. However, there are a few (12%) traders that lower the price to M250.00 or even M200.00. This happens when the quality of firewood is not satisfactory. When the wood is too dry, it burns out quickly. Also, the customers may ask for a discount and because the traders are desperate to make sales, they offer the customers discounts even if the quality and quantity of firewood is up to standard.

5.7. Competition

Competition is an important driver of productivity and output growth (Felix & Chiara, 2019), when two or more businesses are competing for the same customers they work hard in order to attract more customers. The firewood traders from Roma compete for customers because they sell similar products in the same vicinity. They have strategies that lure customers into buying from them. It is therefore potent for businesses to have visible competition because hard work improves the quality and quantity of products, thus attracting more customers.

Table 5.12: Strategies used by the Firewood Traders in Roma to beat the competition, May- June 2023.

Strategy Used to Beat Competition	Frequency	Percentage
Sell Thicker Logs only	10	24
Discounts	5	11
Bigger Loads only	7	17
Thicker Logs & Bigger Loads	20	48
Total	42	100

Source: Field Data

Table 5.12. suggests that the majority (48%) of the firewood traders out-compete their competitors by selling loads of thick firewood. They explained that they had standard measurements for a load of firewood which is an average man’s height from the foot to the weight and one-meter width. They increase the measurements to make their loads bigger to attract customers. They also cut thicker trees to attract customers because thicker logs burn longer.

Customers take advantage of the fact that firewood supply is higher than demand so they ask for discounts even if they can afford to pay the full amount. The standard rate for firewood is M300.00 per load however 11% of the firewood traders admitted to selling it for M50.00 cheaper. Their reasons for selling below the standard price are to attract customers and build clientele. Offering customers discounts builds customer loyalty and increases brand awareness (Lee & Chen-Yu, 2018). A customer is more likely to return to a trader that has offered him/her a discount and is mostly likely to remain loyal to that trader.

5.8. Conservation of available tree resources

Conservation of available tree resources has been addressed in this study and it is one of the most important sections because it prevents the depletion of the available resources. If the forests were to get completely depleted, firewood traders would lose their means of income and there would be serious environmental damage caused by the loss of biodiversity.

The firewood traders practice lenient conservation measures. This is because they consider the forests unlikely to get depleted. The firewood traders explained that the forest has no chance of getting depleted because it has always existed and people have been cutting trees and the forest does to get finished. They believe that the acacia deal bata replicates faster as it is cut down. The

more it is cut, the faster it re-grows. A few of them said that they practice rotational sawing to allow the trees to be replicated. They explained that they only cut fully matured trees, giving smaller ones a chance to grow. In this way, the trees do not get completely depleted. The firewood traders said that the forests are getting thicker, and there is noticeable growth of the forests in the last ten years.

5.9. Firewood Income Expenditure

The firewood traders from Roma spend the income from firewood on day-to-day expenses such as food and other household essentials. Some of them mentioned that they wish to start small businesses that are more sustainable and that will bring in more income than firewood trading. One has started rearing layer chickens since he wants to start selling eggs. According to *The Post* (2023), Lesotho is facing a shortage of eggs, this started around August 2023. The firewood trader plans to take advantage of this egg shortage and supply eggs to the Roma community.

Although firewood sales are low and the traders do not make enough money that makes a huge change in their lives. They are grateful for the little that they make because they are able to buy the essentials such as cooking oil and soap, that they cannot produce themselves. Most of these traders are subsistence farmers. There are no positive community-based improvements that have been brought by firewood trading in the Roma community.

5.10. Relevance of the sustainability theory to the findings of the study

The sustainability theory supports the use of environmental resources for livelihood-making without compromising the ecological balance. The Roma community members use forest trees for domestic purposes such as heating their homes and cooking. Some of them sell firewood and use the income to improve their lives.

According to Malkina-Pykh and Pykh (2016), sustainability refers to making use of environmental resources to meet the needs of the present generation without compromising the ability of the future generation to meet their own needs. This means that environmental resources should not be extracted at a faster rate than they can replicate. The firewood traders of Roma cut the acacia deal bata because it replicates quicker than most tree species. It has less chances of getting depleted. The firewood traders in Roma also cut mature trees in a selected part of the

forest and when they have finished all the matured trees in that part they move to a different part of the forest, giving the smaller trees a chance to mature so that the forest is not left with bare patches. Tree species such as blue-gum that replicate at a slower rate are reserved for village chiefs, the villages are not allowed to cut such trees for marketing purposes because cutting the trees excessively would lead to severe depletion. Sustainability allows humans to use environmental resources without threatening the existence of environmental resources.

5.11. Summary

The findings of this study are that firewood trading as a means of livelihood-making is not enough to ensure survival of the households of the firewood traders. An additional source of income is required because the returns of firewood trading are low due to the low market demand. The study further shows that firewood trading does not always lead to forest degradation. However adequate conservation measures should be taken to ensure the sustainable growth of forests.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.0. Introduction

Firewood trading has been recognised as a means of making a living for many households worldwide. Lesotho is not an exception in this regard. Although firewood trading may pose an environmental threat, the prevailing economic situation in Lesotho forces individuals to continue marketing firewood. In Lesotho, unemployment is sky-high, resulting in higher rates of poverty and food insecurity. This chapter provides a summary of the key conclusions of the study and makes some recommendations to improve firewood trading as a source of income whilst preserving forests and avoiding forest degradation.

6.1. Conclusions

This research study aimed at investigating the impact of cutting down trees for livelihood-making on forest degradation in Roma. Three objectives were set in order to achieve the main aim of the study. Data was collected from the firewood traders in Roma and this focused only on the firewood traders that collected wood from the forests.

The first objective was to identify the factors that contribute to the community use of environmental resources for livelihood-making. The conclusion of the study is that most of the firewood traders resort to firewood trading because of unemployment that leads to poverty. In order to alleviate household poverty, people started to sell firewood.

The study concludes that low education levels within the Roma Community also contribute to the selling of firewood as a livelihood-making strategy. It is difficult to find employment with low educational qualifications. Most firewood traders only completed primary school education hence they do not have jobs.

The second objective was to examine the measures taken by the community to conserve forests and forest resources. The research study concludes that firewood traders in Roma practise rotational sawing as a way to conserve their forests. They only cut mature trees in a particular part of the forest. While the trees are re-growing, the traders move to another part of the forest and cut the mature trees. This practice allows the small trees in different parts of the forest to

mature at different intervals. This practice ensures that there are always trees growing in all parts of the forests.

The third objective was to investigate the contribution of wood marketing to the improvement of the community living standards. The conclusion of the study is that firewood traders do not make enough money to sustain their household needs. The market demand is low and for that reason the sales and profits are also low. Even though the earnings from firewood trading are limited, they still bring a positive impact on their lives. Some of them buy school uniforms for their children, start small businesses and buy food, and other essentials that they cannot get from farming.

6.2. Challenges

The firewood traders in Roma are faced with several challenges. Their major challenge is insufficient market demand for firewood. As a result, the traders are not able to make enough sales to meet their needs. They do not get sales in warm seasons. People within the community of Roma are reluctant to buy firewood because they can access it for free by simply going to the forest to get trees.

Another challenge that they face is high competition. There are over forty consistent firewood traders in Roma and that is quite a large number for the community. High competition forces the traders to lower their prices in order to out-compete the other traders. This decreases their profit margins thus defeating their aim of establishing their businesses. High competition shrinks the available customer base in Roma and the limited market demand makes it more difficult for the traders to make satisfactory sales.

Another challenge is the unstable price of the firewood amongst the traders. Firewood traders often have to lower the price of their firewood because other desperate traders sell at lower prices. Because of the low market demand for firewood and high competition, traders are desperate to sell therefore they even offer clients discounts as a way of attracting them to buy wood. This is problematic to traders that stick to the standard price because their customers flee to traders that sell at lower prices.

6.3. Concluding Remarks

This study investigated firewood trading as a livelihood-making strategy. Conclusions were made based on the findings of the study.

Firewood trading is a promising business that could help alleviate poverty if conducted properly. With the right marketing strategies, firewood traders could generate enough income to support their families. Securing more customers yields more income generation which can be used to improve the living standard of the firewood traders. It is also important that the firewood traders follow conservation measures to protect the forest from degradation.

6.4. Recommendations

This study makes recommendations for the promotion of sustainable firewood trading in Roma. Recommendations are made based on the literature review and the findings of the study.

- The firewood traders do not generate enough income to fully support their households because the firewood market in Roma is congested. There are too many traders in their community. The firewood traders should explore markets outside their communities to avoid market saturation. Although trading in one's own community reduces transportation and relocation costs it could bring in more sales if the trader traded in an undiscovered market. This could increase the sales for the traders, thus enabling them to meet their household needs. Finding an undiscovered market allows traders to establish their own selling price which best accommodates their needs. Increased market leads to higher income.
- The firewood sales are low and this could be because not enough people are aware that there are firewood wood traders in Roma. The advertising methods used by the firewood traders in Roma require potential customers to be in Roma to be aware of the product. Traders use primitive methods such as display and word-to-word advertising. These methods reach a limited number of people. Exploring advanced methods of advertising may be quite fruitful for firewood traders. Social media, television, podcasts, and Radio reach more people, increasing the number of potential customers of the firewood traders.
- Most firewood traders are forced to sell their firewood at discounted prices which result in low income. The traders cannot afford the cost of living. There are a few traders that sell firewood for a lower price than others therefore customers tend to demand discounts because of those traders that sell at lower prices. The firewood traders need to stick to the

standard selling price of wood. Setting and sticking to prices that align with those of the competitors lessens the risk of under-pricing the product, selling a product at the right amount ensures that the entrepreneur generates enough revenue. Losing customers to traders who sells at a lower price could be avoided.

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APPENDIX
Questionnaire

Demographic Information

1. Which gender do you identify yourself as?

Male ()

Female ()

Other.....
.....

2. Indicate your age category.

Younger than 18years ()

18 – 30years ()

31 – 39years ()

40 – 49years ()

50 – 59years ()

60years and above ()

3. What is your marital status?

Single ()

Married ()

Divorced ()

Separated ()

Widowed ()

4. What is your level of education?

None ()

Primary ()

Secondary ()

High school ()

College ()

University ()

Other(specify).....

5. How many household members do you have?

1 – 2 ()

3 – 4 ()

5 – 6 ()

More than 6 ()

6. How many members of your household are employed?

1 ()

2 ()

3 ()

4 ()

More than 4 ()

7. If some members of your household are employed, where are they employed?

Self-employed ()

Informal sector ()

Formal sector ()

Livelihood-Making Strategies

8. Are you employed?

Yes ()

No ()

9. If Yes to question 8, where do you work?

.....

10. Are your means of making a living enough to support your family/ household?

Yes ()

No ()

11. If Yes to question 10 above, why did you opt to sell firewood?

.....

12. If No to question 10 above, what are your alternative means of making a living besides selling firewood?

.....

13. What made you start selling firewood?

.....

.....

14. why did you start selling firewood for making a living?

.....

15. Is firewood selling the main source or supplementary source of your income?

Main source ()

Supplementary source ()

16. If firewood selling is your supplementary source of income, then what is your main source of making a living?

Subsistence farming ()

Piece jobs ()

Informal sector ()

Other(specify).....

Firewood supply

17. On what type of land do you get the trees?

Communal land ()

Private land ()

Other(specify).....

18. Do you need permission to cut trees for firewood?

Yes ()

No ()

19. If Yes to the above question, who grants you permission to cut trees for firewood?

.....
.....

20. If No to question 18 above, how often do you cut trees per week?

Once ()

Twice ()

Thrice ()

Four times ()

Five times ()

Other(specify).....

21. Do you pay for the tree trunk?

No ()

Yes (specify the amount)

22. Is there a limit on the number of tree trunks you can cut daily?

No ()

Yes (specify number limit).....

23. Are there specific tree species that you target?

No ()

Yes (specify by names).....

24. Why do you target those specific tree species?

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

Technology used for cutting trees

25. What type of equipment do you use to cut the trees?

Manual saw ()

Patrol chain-saw ()

Other(specify).....

26. Does one need special skills to operate the equipment that you use?

Yes ()

No ()

27. If Yes to question 24, what kind of skills?

.....

28. Does the equipment you use speed up work?

No ()

Slightly ()

Moderately ()

Extremely ()

29. If the equipment that you use speeds up work, how many trees do you cut per:

Hour ()

Day ()

Transportation

30. Who transports firewood to the customers?

The customers ()

The seller ()

31. How is the firewood transported to the customers?

.....
.....

32. If the seller is the one that transports the firewood to the seller, does the seller charge the customer an extra fee for delivery?

No ()

Yes(how is it calculated?).....

Marketing of firewood

33. Who are the main customers of your wood?

.....
.....

34. Where do most of your customers come from?

.....
.....

35. How do you advertise your product?

Display ()

Media ()

Pamphlets ()

Word of mouth ()

Other(specify).....

36. How is the demand for firewood?

High ()

Low ()

Seasonal ()

(Other).....

37. When the demand is high, how do you ensure that you meet your customers' needs?

.....
.....

38. How much do you sell a heap of firewood for?

.....
.....

39. How many heaps of firewood do you sell per month?

.....

40. What is the average amount of money that you make from firewood sales per month?

.....
.....

41. Are you satisfied with the income that you make from selling firewood?

Yes ()

No ()

Competition

42. Who are your competitors?

.....

43. Do you and your competitors have a standard selling price?

Yes ()

No ()

44. If No to the above question, do you sell at a lower or higher price than they do?

.....

45. What do you do to out-compete other sellers?

.....

.....

Conservation of available tree resources

46. What do you do to ensure that the trees do not get depleted?

.....
.....

47. Who is responsible for protecting trees in your area?

Villagers ()

Local chief ()

Community Council ()

48. Are there laws that protect your forests?

Yes ()

No ()

49. If Yes to question 48, what measures are taken when one does not abide by the laws?

They are punished ()

They are fined ()

Other(specify).....
.....

50. Are available conservation measures working to decrease the excessive cutting of trees?

Yes ()

No ()

51. If No to question 50, what can be done to make them effective?

.....

52. What was the state of your forest area in the past ten years?

.....

.....

53. What contributed to the changes?

.....

.....

Firewood income expenditure

54. How do you spend the income that you make from selling firewood?

.....

.....

55. Are there improvements in your household living conditions brought about by the proceedings you make from selling firewood?

No ()

Yes(specify).....

.....

56. Which positive community-based improvements have been brought by the selling of firewood?

.....
.....

Thank you for your time!!!