

**GENDER ROLES AND THEIR IMPLICATIONS IN CHARCOAL PRODUCTION AND
MARKETING IN MAKUNKA AREA OF KAZUNGULA DISTRICT, ZAMBIA.**

By

KEBBY SIAKACHOMA

Computer Number: 513802399

**A Dissertation Submitted to The University of Zambia in Partial Fulfillment of The
Requirements of The Degree of Master of Science in Environmental and Natural Resources
Management.**

THE UNIVERSITY OF ZAMBIA.

Lusaka.

2019.

COPYRIGHT DECLARATION

All rights reserved. No part of this dissertation may be produced, stored in any retrieval system, or transmitted, in any form or by any means (electronic, photocopy, recording, or otherwise) without the prior permission in writing from the author or the University of Zambia.

© 2019 Kebby Siakachoma

DECLARATION

This dissertation represents my own work and it has not previously been submitted for a degree, diploma or any other qualification at this or another university.

Signature:

Date:

CERTIFICATE OF APPROVAL

This dissertation by **Kebby Siakachoma** computer number **513802399** is approved as fulfilling part of the requirements for the award of Master of Science Degree in Environmental and Natural Resources Management at the University of Zambia.

Name of internal Examiner: 1

Signature

Date

.....

.....

.....

Name of internal Examiner: 2

Signature

Date

.....

.....

.....

Name of internal Examiner: 3

Signature

Date

.....

.....

.....

Chairperson of the Board of Examiners

Signature

Date

.....

.....

.....

ABSTRACT

Although the charcoal value chain generates significant employment opportunities, men and women do not necessarily participate the same way, and benefits may not be evenly distributed between them. Gender is a core issue deserving of distinction among many issues that affect human fairness and efficiency in development. This study explored gender roles and their implications in charcoal production and marketing in Makunka area of Kazungula district. The objectives were achieved through a qualitative study of the subject. A sample of 60 charcoal producers and marketers comprising 35 men and 25 women representing 58.3 percent and 41.7 percent respectively was selected using snowball sampling method. Semi structured interviews were administered to the charcoal producers and marketers. Key informant interviews were administered to 2 Forest Department officials. These interviewees were purposively selected as they were known to have knowledge on charcoal production and marketing. A focus group discussion was held with men and women to further investigate gender dynamics in charcoal production and marketing from a group setting. The data collected from charcoal producers and marketers was analyzed using thematic analysis. Results show that 63 percent of men (n=35) and 55 percent of the women (n=25) reported that men mostly transport charcoal while 49 percent of men and 57 percent of women respondents reported that charcoal marketing was mostly done by women. 45 percent of the men respondents and three quarters (75%) of women respondents indicated that men do not normally sell their charcoal at production sites. 40 percent and 67 percent of the men and women respondents respectively observed that women experience higher costs of charcoal production and marketing costs than men. The study concluded that the major gender roles in charcoal production and marketing were; cutting down trees which was done by both men and women, charcoal transportation done by men and charcoal selling done by women. Men also dominated in tree selection, cross cutting into sizable logs and transporting the charcoal to the market place whereas women were also involved in tree felling using fire, firing the kiln and monitoring the burning kiln. The high demand posted on the market for charcoal due to factors like load shedding and the inability of poor people to access alternative energy sources was recognized as an opportunity to raise income, coupled with low entry barriers in the charcoal value chain. The challenges in charcoal production and marketing were among others poor market structure, too much labor involved and health issues due to exposure to residue waste from the production processes. Some of the implications of gender roles in charcoal production and marketing were, use of unsuitable tree species, low income for women as they had to use hired labor and sell at production sites and more income for men due to greater market coverage and better-quality charcoal. This study recommends the formation of a charcoal producers and marketers association to promote specialization of men and women in the roles that they do in the charcoal value chain while involving the Forestry Department and other bodies to sensitize men and women on better practices as opposed to the use of conventional traditional methods which lead to forest degradation.

DEDICATION

To my parents and children.

ACKNOWLEDGEMENTS

The Greatest thanks go to the Almighty loving father, Jehovah God, the source of all forms of knowledge for leading me this far. Without His support, I would not have made it. I owe it to Him. To my Supervisors Dr. Bridget Bwalya Umar and Dr. Progress. H. Nyanga, this dissertation is the result of your knowledgeable suggestions and unrelenting but constructive provocations/criticisms for my own good. You made me believe that I can do it!

I am most grateful to my research participants for courageously sharing their life experiences with me. Without your brave stories, I would not manage. Thank you so much. Hats off to all the key informants for granting me easy access and sharing your insights on various issues of concern. I really do not have many words to use in order to appreciate your kind assistance.

I thank all my lecturers in the Department of Geography and Environmental Studies for their support in one way or another.

I thank my Head teacher Mr. Miyanda, C. H for supporting, encouraging and protecting me during my research.

I also thank Mr. Ndema Robson of Ndondi Secondary School for his encouragement and help during the course of studies.

Many thanks go to my two research assistants Mr. Siabulongo Chriscient and Mr. Mwiinde who were active as tour guides.

Lastly, but not the least, all my dear brothers and friends for your loving support and encouragement all through the years. Thank you so much! Many thanks to my dear colleagues, Dariet, Janet, Betty, Blessed, Ziba, Innocent, Jimmy and Chitula. Thanks for the conducive environment throughout our study period.

TABLE OF CONTENTS

	Page
COPYRIGHT DECLARATION.....	i
DECLARATION.....	ii
CERTIFICATE OF APPROVAL	iii
ABSTRACT.....	iv
DEDICATION.....	v
ACKNOWLEDGEMENTS	vi
TABLE OF CONTENTS	vii
LIST OF TABLES	xi
LIST OF FIGURES	xii
LIST OF PLATES	xiii
LIST OF ACRONYMS AND ABBREVIATIONS	xiv
CHAPTER ONE: INTRODUCTION.....	1
1.1 Background to the Study	1
1.2 Problem Statement	2
1.3 Aim.....	2
1.4 Specific Objectives.....	2
1.5 Research Questions	3
1.6 Significance of the Study	3
1.7 Scope of the Study.....	3
1.8 Conceptual Framework	4
1.9 Research Outline	5
CHAPTER TWO: LITERATURE REVIEW.....	6
2.1 Introduction	6
2.2 General outlook.....	6
2.3 Gender and Gender Roles	7
2.4 Current Situation of Gender in Zambia.....	8

2.4.1	Gender Policy in Zambia	9
2.4.2	Gender and Energy	9
2.4.2.1	Energy Policy in Zambia	10
2.5	Gender and Value Chains.....	11
2.6	Gender in FTA value chains.....	12
2.7	Gender in the Charcoal Value Chain.....	14
2.7.1	The Charcoal Production Process	14
2.7.2	Gender Roles in the Charcoal Value Chain	15
2.7.3	Opportunities Associated with Men and Women’s Entry into the Charcoal Value Chain	16
2.7.4	Challenges Faced by Men and Women in Charcoal Production and Marketing....	17
2.7.5	Implications of Men’s and Women’s participation in Charcoal Production	18
2.7.6	Environmental impacts in Charcoal Production	19
2.8	Gap in Literature	21
CHAPTER THREE: DESCRIPTION OF THE STUDY AREA.....		22
3.1	Introduction	22
3.2	Location of the Study Area	22
3.3	Climatic Conditions of the Study Area	24
3.4	Vegetation and Type of Soil of the Study Area	24
3.5	Socio-Economic Characteristics of the Study Area	25
CHAPTER FOUR: METHODOLOGY		28
4.1	Introduction	28
4.2	Research Design.....	28
4.2.1	Target Population.....	28
4.2.2	Sampling techniques	28
4.2.2.1	Purposive Sampling.....	28
4.2.2.2	Snowball Sampling.....	29
4.2.3	Data Collection Methods	29
4.2.3.1	Semi- Structured Interview Guides	29
4.2.3.2	Focus group discussion.....	30
4.2.3.3	Observation.....	30

4.2.4	Data analysis	31
CHAPTER FIVE: FINDINGS AND DISCUSSION		32
5.1	Introduction.	32
5.2	Background Information of the Respondents.....	32
5.2.1	Age Range of the Respondents	32
5.2.2	Gender of the Respondents	33
5.2.3	Marital Status of the Charcoal Producers	34
5.2.4	Respondents Level of Education	34
5.3	Roles Performed by Men and Women in Charcoal Production and Marketing.....	35
5.4	License for Charcoal Production.....	40
5.5	An opportunity for Women and Men to Engage in Charcoal Production and Marketing in Makunka.....	40
5.5.1	High Charcoal Demand.....	41
5.5.2	Issuance of Permits	41
5.5.3	Regeneration of Trees	42
5.6	Challenges Associated with Charcoal Production and Marketing in Makunka.....	43
5.6.1	Poor Market Structure.....	43
5.6.2	Too Much Labor	44
5.6.3	Lack of Packaging materials for Charcoal.....	44
5.6.4	Health Problems.....	45
5.6.5	Lack of Government Support.....	45
5.6.6	Depletion of Desired Tree Species	46
5.6.7	Difficulties in acquiring licenses	46
5.6.8	Lack of reliable means of transport	47
5.7	Implications of Gender Roles in Charcoal Production and Marketing in Makunka Area of Kazungula District.	47
5.7.1	Implications of Gender Roles in Charcoal Production and Marketing for Men.....	47
5.7.2	Implications of Gender Roles in Charcoal Production and Marketing for Women	49
CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS		52
6.1	Introduction	52
6.2	Conclusions	52

6.3	Recommendations	53
6.4	Future research	54
REFERENCES.....		55
APPENDIX A: Interview Guide for Charcoal Producers and Marketers.....		61
APPENDIX B: Interview Guide for the Key Informants from Forestry Department.....		64
APPENDIX C: Consent Sheet for the Participants		65

LIST OF TABLES

Table No.	Description.	Page
5.1:	Opportunities for charcoal production and marketing in Makunka.....	41
5.2:	Challenges faced by charcoal producers and marketers in Makunka.	43

LIST OF FIGURES

Figure No.	Description.	Page
1.1:	Conceptual framework for gender roles and the charcoal value chain.....	5
3.1:	Makunka area of Kazungula district.....	23
5.1:	Age range of the respondents.....	33
5.2:	Marital status of the participants.....	34
5.3:	Respondents` level of education	35
5.4:	Gender roles in charcoal value chain in Makunka area	36

LIST OF PLATES

Plate No.	Description.	Page
5.1:	Man discussing with wife about selling charcoal and keeping the money for future use.	37
5.2:	A woman using fire to cut trees	38
5.3:	Men transporting charcoal to the market.	39
5.4:	A man harvesting regenerated trees for charcoal production.	42
5.5:	Over burnt charcoal at one of the kilns in Makunka area.	49
5.6:	Degraded Forest of preferred tree species due to charcoal production in Makunka	51

LIST OF ACRONYMS AND ABBREVIATIONS

CIFOR	: Center for International Forestry Research
CSO	: Central Statistical Office
FAO	: Food and Agriculture Organization
FTA	: Forest Trees and Agroforestry
FFF	: Forest and Farm Facility
GRZ	: Government of the Republic of Zambia
MTN	: Mobile Telephone Network
NGP	: National Gender Policy
ZMW	: Zambian Kwacha

CHAPTER ONE: INTRODUCTION

This chapter presents the background to the study, the statement of the problem, aim of the study, specific objectives, research questions, significance of the study, scope of the study, the conceptual framework and the research outline.

1.1 Background to the Study

Gender is a core issue deserving of distinction among many issues that positively or negatively affect human fairness and efficiency in development (Khamati *et al.*, 2005). In this regard, it is crucial to recognize the fact that both men and women have different abilities and skills needed in a given society so as to foster development in a sustainable manner. Redding (2011) observed that gender roles have continued to influence important individual decisions in families and in turn have effects on the environment, economy and society. Nyaruwata and Chideya (2014) observed that family, religion and ethnicity affect the roles men and women perform in a given society. The gender roles and responsibilities that are influenced by social, economic and cultural factors dictate the positioning of women and men in society. According to the study by Farré (2012), husbands and fathers can directly affect the economic and social processes of women as well as having a final say on women's participation in the labor market. Not only that, but also men's limited participation in childcare and household work places great pressure or burdens on women.

In general, men and women perform different roles in many livelihood activities in rural and urban areas and charcoal production and marketing cannot be an exception. Pike (2012) contends that a profitable and stable charcoal business requires joint actions from men and women. In the same line of thought, Redding (2011) contended that there is need to ensure that the talent pool and potential of women is used extensively and efficiently in order to have a smart, sustainable and inclusive charcoal industry.

Charcoal plays a significant role in the energy requirement especially in Sub-Saharan Africa where its dependence is increasing due to the growing urban population and limited accessibility to alternative fuels (Herd, 2007). However, Charcoal is not only an important energy source for a large section of the urban population of developing countries (Wood and Garside, 2014) but is also a salient source of income and livelihoods to those engaged in its production, transportation and marketing. Charcoal can significantly contribute to the well-being of the people involved along its

value chain and contribute to the government revenue through tax collection as long as it is managed properly. In Zambia the charcoal business is worth five billion Kwacha and accounts for 2.3 percent of the Gross Domestic Product. According to Ziba and Grouwels (2017), in Zambia the government with the support of the Forest and Farm Facility (FFF) is exploring ways to help recognize and organize the actors in charcoal value chains, contributing to more sustainable management and improved capture of value by producers, traders and government. Each value chain in charcoal business is associated with activities or roles that are done by men and women. The charcoal value chain consists of production, transportation and marketing. Although charcoal is produced in rural and peri-urban areas, its usage largely occurs in urban areas and so it has to be transported there (Herd, 2007).

A clear picture of gender roles and their implications in charcoal production and marketing can only be known if a study was conducted. It was against this background that this study endeavored to determine gender roles and their implications in charcoal production and marketing in Makunka area of Kazungula district.

1.2 Problem Statement

Roles performed by men and women during charcoal production and marketing have adverse implications in the charcoal sector. These implications can be for men or women and at times for both. It is not clear what roles men and women perform and the associated implications in charcoal production and marketing. An understanding of gender roles and their implications in charcoal production and marketing will facilitate in identifying suitable measures for improving charcoal production and marketing as well as reversing the associated adverse implications. Therefore, this study was undertaken to determine gender roles and their implications in charcoal production and marketing in Makunka area of Kazungula district.

1.3 Aim

The aim of this study was to examine gender dimensions in the charcoal value chain (from tree selection to selling of charcoal) in Makunka area of Kazungula district.

1.4 Specific Objectives

The specific objectives of the study were to:

- (i) Identify gender roles in the production of charcoal in Makunka area of Kazungula district.

- (ii) Identify gender roles in the marketing of charcoal in Makunka area of Kazungula district.
- (iii) Identify opportunities associated with charcoal production and marketing in Makunka area of Kazungula district.
- (iv) Find out challenges associated with charcoal production and marketing in Makunka area of Kazungula district.
- (v) Determine the implications of gender roles in charcoal production and marketing in Makunka area of Kazungula district.

1.5 Research Questions

- i. What are the roles performed by men and women in the production of charcoal in Makunka area of Kazungula district?
- ii. What are the roles performed by men and women in the marketing of charcoal in Makunka area of Kazungula district?
- iii. What opportunities are there for men and women to venture into charcoal production and marketing in Makunka area?
- iv. What challenges are faced by men and women in charcoal production and marketing in Makunka area of Kazungula district?
- v. What are the implications of roles performed by men and women in charcoal production and marketing in Makunka area of Kazungula district?

1.6 Significance of the Study

The findings are hoped to be a reference for policy makers and planners when dealing with charcoal issues and policies. It is also hoped that the findings will be a useful basis for finding appropriate measures aimed at reducing any adverse implications associated with gender roles in charcoal production and marketing in the study area and beyond. The findings are hoped to serve as a reference for further research in related studies in the area and beyond.

1.7 Scope of the Study

The study was confined to eight selected villages in Makunka area of Kazungula district. The study examined gender roles and their implications in charcoal production and marketing in the eight villages. The study examined the following variables in order to achieve its objectives; the gender roles in charcoal production, the social-economic characteristics of the charcoal enterprise,

opportunities and challenges associated with charcoal production and marketing and the implications of gender roles in charcoal production and marketing. The study looked at the charcoal value chain from the production node to the marketing node.

1.8 Conceptual Framework

A multidimensional conceptual framework was used to guide the research (Figure 1.1). The sustainable livelihoods approach (Chambers and Conway 1991 cited Haverhals *et al.*, 2016) was combined with value chain analysis (Kaplinsky and Morris 2000 cited Haverhals *et al.*, 2016) using a gendered lens (Colfer 2014) as used by Haverhals *et al.*, (2016) but modified specifically for the charcoal value chain.

Using the sustainable livelihoods approach implies that livelihood and sustainability outcomes are analyzed for the actors involved in the chain, based on an analysis of context and an identification of interventions and resulting outcomes, (Haverhals *et al.*, 2016). The framework also highlights the role of governance structures and other contextual factors, in setting the ‘rules of the game’ (Haverhals *et al.*, 2016), while adopting a gender lens to assess how they influence the gender dynamics of value chain participation and benefits. Putting value chain analysis at the core implies a thorough analysis of the activities and participants along the charcoal value chain (producers, transporters, traders, retailers, consumers etc.).

Such a gendered value chain analysis will allow the nature of gender differences embedded in the charcoal value chain to be seen. This conceptual framework is also designed to directly examine empowerment outcomes attributed to differentiated extent of value chain participation. The framework also considers qualitative differences in women and men's participation, with regards to the different nodes of the charcoal value chain, in terms of age, marital status, income and education level.

Three key nodes were identified: charcoal production, transport and retail. The activities involved in charcoal production are; Tree selection, Tree felling, debranching into sizable logs, kiln construction, kiln monitoring, charcoal separation and packing. Leading to transportation to the market place where the charcoal is finally sold (Gumbo *et al.*, 2013: Herd, 2007: Vos and Viz, 2010: Kazimoto, 2015).

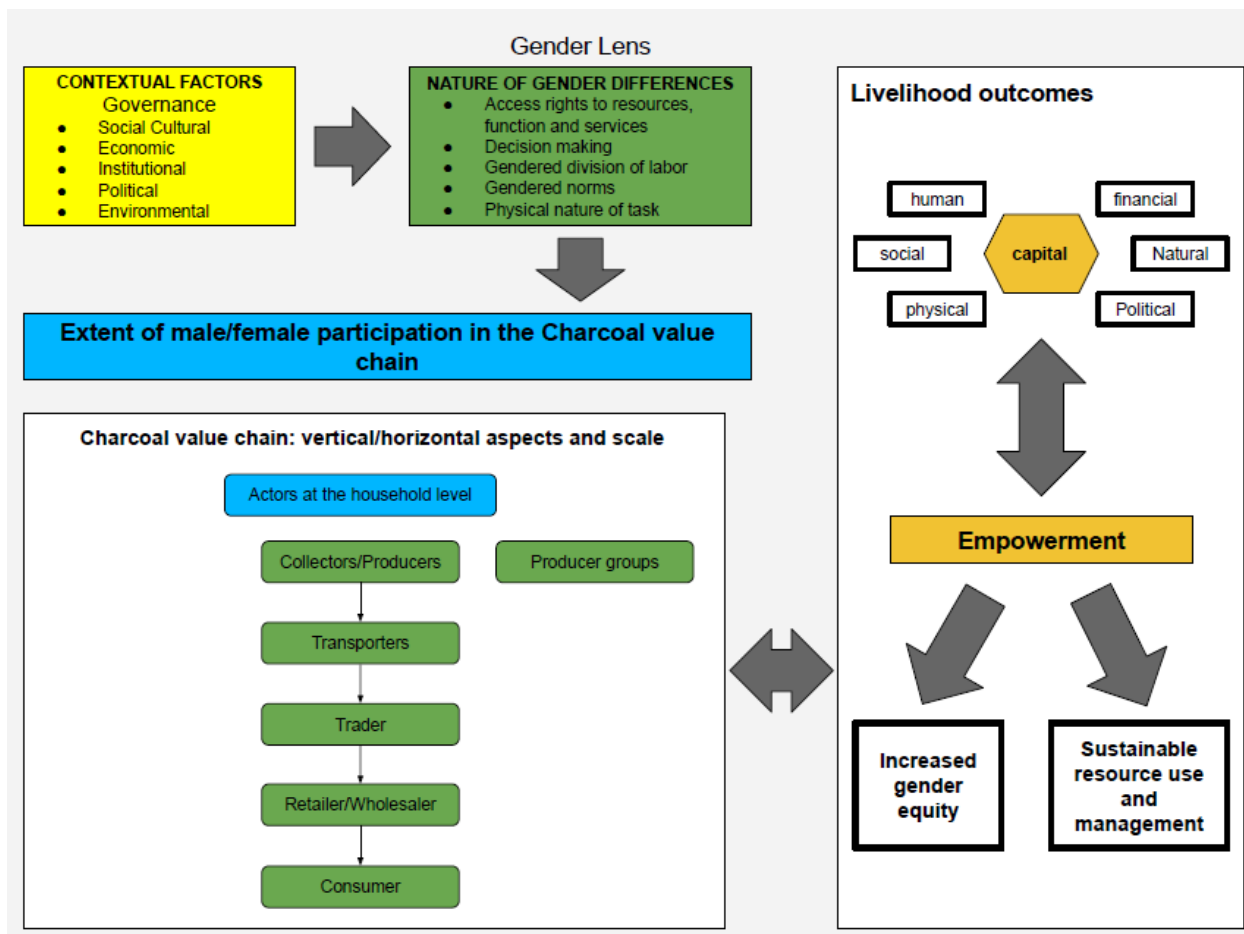


Figure 1.1: Conceptual framework for gender roles and the charcoal value chain

(adapted from Haverhals *et al.*, 2016)

1.9 Research Outline

This research is divided into six chapters: the first chapter presents an introduction to the research topic which includes the background of study, statement of the problem, research objectives, research questions, significance of the study, scope of the study, conceptual framework, and research outline. Chapter two contains a literature review on gender, gender roles, gender in Zambia, gender and value chains gender in FTA values, gender in the charcoal value chain and the gap in literature while chapter three gives the description of the study area. Chapter four describes the research methodology while chapter five presents the findings and discussion. Conclusion and recommendations are made in chapter six.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter presents literature review in related areas of the study. The review is categorized into broad categories of literature for examination based on the themes most widely present. The themes are: Gender and gender roles, gender in Zambia, gender and value chains, gender and FTA value chains and gender in the charcoal value chain.

2.2 General outlook

There has been increasing global attention to gender in the past decade across many countries, its role in development, and inequalities that exist between men and women (FAO 2012). According to Empacher *et al.* (2001 cited Kiptot, 2015) and Ott (2002 cited Kiptot, 2015), gender inequalities in relation to natural resource management are determined by the following factors: the social norms and institutional rules of rural communities; the gendered division of labor in natural resource management; the gendered knowledge systems on the environment; the differences in the extent to which women and men access natural, physical, financial and human capital; and gendered discrepancies in decision-making processes. Kiptot (2015) goes on further to state that social norms and institutional rules of rural communities are linked to roles and responsibilities. These social norms influence decisions and choices made by men and women from the household level to their participation in value chains.

In as much as problems have been identified in the livelihood context generally for both women and men in different sectors, some studies have shown marginal differences in the lines of gender. For example, a body of empirical evidence indicates that women experience poverty and deprivation in different ways from men (Ziba and Grouwels, 2017). Women usually have fewer assets and rights than men, are more vulnerable to loss of these assets and rights due to separation, divorce, or widowhood, and have less access to capital, extension, inputs, and resources for agricultural production (Behrman, and Quisumbing 2010; Quisumbing 2003; Quisumbing 2009 cited Kiptot, 2015). Not only is there a difference in the manner in which some problems are gender specific but also in the differentiated roles toward production with implications on household sustainability. One of those implications is that of women's asset holdings often having positive effects on important development outcomes including household food security and human capital formation (Smith *et al.*, 2003; FAO 2011). Therefore, helping women gain more access to and control of key assets could help achieve many development gains and improvements in human

well-being. Women seem to suffer more negative impacts in terms of their assets and wellbeing because of social and cultural norms regarding gender roles and their lack of access to and control of capital. This may in turn affect food security and human capital at the household level. In as much as this is the social context (that of gender inequality), it will be noted that addressing gender inequality becomes an important means of enhancing the efficiency, inclusivity and sustainability of the charcoal value chain. Thereby increasing the participation and benefits of both men and women involved in the value chain.

2.3 Gender and Gender Roles

Gender refers to the attributes and opportunities associated with being male and female, and the socio-cultural relationships between women and men, and boys and girls as well as the relations between different groups of women and different groups of men (GRZ, 2014). Nyaruwata and Chideya (2014) define gender as the socially constructed roles, behaviors, activities and attributes that a given society considers appropriate for children, the youth, the elderly, men and women. Ongoro and Ogara (2012) also pointed out that gender determines what is expected, allowed and valued in a woman's or man's behavior in a specific context.

Gender roles on the other hand are the functional responsibilities which are assigned by society and are influenced by cultural, political, religious and economic situations, varying from region to region within cultures and change over time (GRZ, 2014). In short, Gender roles are the expected attitudes and behaviors a society associates with each sex. Sex is an ascribed status because a person is born with it, but gender is an achieved status because it must be learned Lindsey & Linda (2015).

It is clear that men and women are likely to have different roles in any livelihood activity as they have different forms of knowledge and skills on various livelihood activities (Ongoro and Ogara, 2012). Gender roles have the potential to bring about division of labor which in turn ensures high productivity as observed by Miller and Razavi (1995). Gender roles affect human behavior in general. It is worth noting that gender roles and relations are dynamic; which means that they evolve over time in response to changing circumstances, needs and interests.

Throughout Africa, roles and responsibilities are gendered. Men are responsible primarily for productive work while women are responsible for both productive and reproductive work (Kiptot 2015). To address issues like gender imbalances and others, it is important to understand the social relations between men and women in different contexts. Gender roles and responsibilities, which

are influenced by social, economic and cultural factors dictate the positioning of men and women in society.

2.4 Current Situation of Gender in Zambia

According to the Central Statistical Office (2010), women account for 51% of the population of Zambia. However, due to factors such as the low levels of education, limited access to and control over resources, and the division of labor, women participation in the development process has been impeded. These factors have been exacerbated by cultural values and norms which promote unequal power relations among women and men (Phiri and Chisonga, 2013).

Women in are generally responsible for reproductive work, such as taking care of the children, preparing food for the family, while both men and women undertake productive work (Kiptot, 2015). Kiptot (2015) also states that, in some cases, women and men play parallel roles or take on complementary tasks that contribute to the shared responsibility for the household. Women are mainly responsible for the general wellbeing of the household such as managing food and fuel needs. In contrast, men are mostly responsible for raising income for the household and therefore often engage in high-value activities such as timber production. Current data shows that women have continued to lag behind their male counterparts in all spheres of national development (GRZ 2014: JICA 2016). At community and household levels, women are in most cases restricted from participating in important decisions such as resource planning and use, family planning and access to services such as health and education. According to the 2012 Labor Force Survey, women played a critical role in sustaining a productive agricultural sector through the provision of 60.6 percent of labor, despite this, they still experience unequal access to and control over important productive resources such as land and other important inputs (GRZ, 2014).

In the Republic of Zambia, there exists a deep-rooted concept of an unequal gender relationship in which men are considered to be superior to women (JICA, 2016). This biased view regarding gender equality originates from not only traditional cultural and social norms but also from the dual structure of statutory law and customary law (JICA, 2016). The report also stated that, rights which are supposed to be protected under statutory law are not necessarily observed and women endure unfair treatment in terms of child marriage, unequal distribution of property, etc.

The 2010 Census of Population and Housing showed that the majority of Zambia's population (65%), lived in rural areas. Urban poverty in 2010 was estimated at 28 percent compared to 78

percent in rural areas. Extreme poverty, which reflects a household's inability to meet its nutritional requirements, was estimated at 58 percent for rural areas and 13 percent for urban areas. According to the Living Conditions Monitoring Survey (2010), overall poverty was marginally higher among female populations at 80 percent compared to the male population at 78 percent. The existing gender inequalities between women and men compound the situation further due to the significant differences in opportunities available (JICA, 2016). As a result, Extreme poverty levels were more pronounced in female headed households than male headed households.

2.4.1 Gender Policy in Zambia

According to Milimo *et al.*, (2004), the gender ideology influences policy planning, legislation, social services provision and general administrative practices. There have been some positive developments at the policy level in Zambia, including the establishment of an independent Ministry of Gender in 2012 and the National Gender Policy in 2014. This policy lists the strategies and actions to be implemented by government ministries and agencies in 15 different fields to achieve gender equality. With regards to poverty the government has embarked on increasing women's access to livelihood support and also empowering women, men and youths through increased agricultural production and enhanced value chains for agro-products in order to improve livelihoods among households in rural communities over a five-year period (GRZ, 2018).

The national gender policy is aimed at ensuring the attainment of gender equality in the development process by redressing existing gender imbalances (GRZ, 2014). The policy provides equal opportunities for women and men to actively take part and contribute to their fullest ability to national development (GRZ, 2014).

2.4.2 Gender and Energy

Energy is one of the most essential inputs for sustaining people's livelihoods. At the most basic level, energy provides cooked food, boiled water and warmth. It has long been established that poor people mostly use biomass as their energy carrier (Clancy, Skutsh and Batchelor, 2003). It was also stated by the Government of Zambia that the major source of energy in most households especially in rural Zambia is wood fuel. (GRZ, 2014).

Mihyo, *et al.* (2015) argued that most of the energy policies do not address the major energy needs of women which are different from those of men. A similar observation was made by Khamati *et al.* (2005) who indicated that energy planning is mostly gender-blind as it tends to exclude women.

This is because the usage of traditional fuel for subsistence activities (non-productive activities) were more common among the women while the use of modern traded fuel and energy services used for income earning or productive activities were more concentrated among men. (Khamati *et al.*, 2005). Additionally, Malonza and fedha (2015) revealed that most energy policies neither give much consideration to the household energy needs by women nor propagate for alternative energy options. Further they indicated that despite the growing knowledge base on linkages between gender, energy and poverty, women`s energy needs have not been taken into account as a key variable in energy interventions.

The United Nation Development Programme (2004) reported that in most cases energy planning is focused on increasing supplies of fuel and electricity especially for industries and urban uses with little attention to the energy demand characteristics of women in underserved rural areas. A more holistic approach to household energy which addresses both practical and productive energy need is required as many of women`s income generating activities are actually carried out in the household as UNDP (2004) observed. Women`s access to decision-making within the household and community is restricted, limiting their ability to influence processes and resource allocation on many issues including energy (Clancy, Skutsh and Batchelor, 2003). It is a well-known fact that energy access in every family depends on household decision making in which women`s preferences, opportunity cost of time and welfare are reflected in such decisions (Kohlin *et al.*, 2012). Kohlin *et al.* (2012) further pointed out that the participation of women in house hold decision making is likely to increase the likelihood that women will benefit from the energy related interventions.

2.4.2.1 Energy Policy in Zambia

Zambia is richly endowed with a wide range of indigenous energy resources such as woodlands and forests, hydropower, coal and renewable sources of energy (GRZ, 2007). The energy policy of Zambia targets to reduce dependence on wood fuel and ensure sustainable provision of affordable and reliable modern energy sources to rural and urban households as a means of raising productivity and standard of living (Muzeya, 2015). The main uses of charcoal at household level are cooking and heating. Due to low-income levels and the abundance of wood resources, wood fuel usage may continue to dominate Zambia`s energy consumption. In order to improve on the technology of charcoal production and utilization, the Zambian government through its national energy policy intends to;

Train charcoal producers in better organization and management of charcoal production, improve its revenue collection from the wood fuel industry by involving traditional leaders and government department in revenue collection, promote affirmative action where feasible to enhance the participation of women in the energy sector and to ensure gender balance by defining the key roles played by women, men and children in the energy projects (GRZ, 2007: 32).

Only 22 percent of Zambia's 13.1 million people as a country's population is connected to electricity (Malama *et al.*, 2015). Wood energy in form of charcoal and fire wood has the largest portion of the total national energy which accounts for 79 percent, with the rest as follows; electricity 10 percent, petroleum products 9 percent and coal 2 percent.

One of the objectives of the National energy policy in Zambia is to promote gender balance in energy planning by ensuring that there is balanced representation of men and women at all levels and in all spheres of energy development and management. Women are known to play a vital role in the provision and management of energy resources in rural areas, as such, there is need to accelerate the representation of women in all the activities to do with energy development and management (GRZ 2007:15)

2.5 Gender and Value Chains

A value chain describes the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use (Kaplinsky and Morris, 2000). Riisgaard *et al.* (2010 cited Mutua, Njuki and Waithanji, 2014) noted that adopting the value chain approach as a development strategy provides an opportunity for all actors to understand each other's functions and the activities involved; increase their viability, visibility, voice and market share; and identify and correct barriers and gaps that cause inefficiencies.

Value chains exist and operate within a given social and cultural context that affects the distribution of resources, benefits and opportunities. Hence the need to integrate gender with value chains comes with an aim of improving returns of the participants and increasing the efficiency of the value chain. Value chains offer tremendous opportunities to men and women through better market linkages and employment opportunities (Mutua, Njuki and Waithanji, 2014).

Addressing gender equality therefore becomes an important means of enhancing the efficiency, inclusivity and sustainability of a value chain. Gender analysis in rural value chains, revolve around examining the influence of gender relations to participation and benefits (Rubin and Manfre, 2014). According to Kaplisky and Morris (2000) barriers like access to capital and technologies influence people's, and especially women's, participation and benefits from value chains. At the household level, there is an interplay between the extent of involvement of men and women in value chains and its effect on the respective opposite sex, that is to say, the level of men's participation in value chains affects women in the respective households and vice versa. Thus, gender relations at the household level play a key role in determining the extent to which men and women interact within a value chain (Mutua, Njuki and Waithanji, 2014). Mutua, Njuki and Waithanji (2014) further state that the degrees of participation and gains are shaped at the household level by gendered divisions of labor/time budgets and decision-making/control; and at the value chain level by differential access to chain functions, services and resources, and by gender related power disparities in chain management. In relation to women and value chains Laven *et al.* (2009), states that empowerment is about changing gender relations to enhance women's ability to shape their lives. From an empowerment perspective, differences in how women and men are involved in (and benefit from) value chains are not by definition a problem, because differences in preferences have to be distinguished from denials of choice (Mutua, Njuki and Waithanji, 2014).

2.6 Gender in FTA value chains

Forest, tree and agroforestry (FTA) products refer to commodities sourced from a continuum of wild and managed forests, fallows and farms, and individual trees (Haverhals *et. al.*, 2016). FTA products are particularly important for marginalized groups, such as women, whose limited access to land, credit and other assets hamper their ability to pursue alternate livelihood opportunities (Haverhals *et. al.*, 2016). The critical link between gender and forest-based livelihoods is gaining recognition as stated by Ingram *et. al.*, (2016). They state further that the realization that much of the informal trade in common raw and processed FTA products is undertaken by women has led to widespread promotion of these products, particularly by agencies interested in enhancing gender equity and women's empowerment.

In a research aimed at Exploring gender and forest, tree and agroforestry value chains, Haverhals *et al.* (2016) carefully selected 126 publications out of 185 which were read in full and coded

according to the types of gender differences; where these differences were located along the chain; the type of FTA chain; factors explaining differences; the types of interventions; the geographic origin of the chain; and outcomes or impacts. Out of these, two-thirds (65%) were based in Africa, 21 percent in Asia and 14 percent in Latin America. They found that the influence of each factor varied according to the product, geographic region and cultural setting. However, the following broad trends were observed: social and cultural factors that influence how chains are governed: Differences due to the nature of the product and activity: Gendered power relations at the household level: Governance, political, institutional and economic factors: Resource degradation: and other demographic characteristics within the male and female subgroups. Similar trends were observed by other publications (FAO 2012; Kiptot, Franzel and Degrande, 2014; Ott, 2002; Kiptot 2015), where it was revealed that, the gender differences in relation to natural resource management were determined by factors such as: the social norms and institutional rules of rural communities: the gendered division of labor in natural resource management: the gendered knowledge systems on the environment: the differences in the extent to which women and men access natural, physical, financial and human capital; and gendered discrepancies in decision-making processes. The systematic review by Haverhals *et al.* (2016) reveals that women's and men's participation in FTA value chains is shaped by other factors of social differentiation such as education, marital status, age and ethnicity. The review also exposed that, in general, female dominance is recorded at the harvester, processor and trader stages, there being strong differences depending on geographic region and product. At the harvester stage, female dominance was found to only hold in Africa. An overall trend is that women are mostly confined to small-scale retail trade, and that men run larger FTA businesses (Haverhals *et al.*, 2016).

Kiptot, (2015) highlighted that different parts of the same tree may be gender specific in use, as a result, men's and women's priorities and preferences for tree species choices stem from their roles and responsibilities. For example, men are typically interested in trees for commercial purposes while women are more inclined to plant trees for subsistence uses such as firewood, soil fertility improvement, fodder and fruits which revolve around their household roles (Kiptot, 2015). It is therefore clear from this data that gender specific preferences and knowledge on tree products could shape a more conscious allocation of roles in FTA value chains.

Resource degradation has been shown to cause drops in the quality and quantity of certain FTA resources. Women were in most cases are more vulnerable than men to this degradation because

of their dependence on natural resources and lack of participation in decision making within institutions concerned with access to FTA resources and/or markets (Ingram *et al.*, 2016). It is clear that the opportunities for people to support themselves from the land are limited (Kiptot, 2015). Fortunately, it is possible to manage some tree enterprises for multiple products, in a way that both men and women can benefit. But even where women are involved in the production and collection of FTA products, their involvement in marketing may be limited by the mode of transport used to transport these products.

2.7 Gender in the Charcoal Value Chain

2.7.1 The Charcoal Production Process

Charcoal is mainly produced in rural areas; however, it is predominantly used in peri-urban and urban areas where there is little opportunity for collection of firewood (NEMA, 2007 cited Pike, 2012). The charcoal industry in Zambia is worth five billion kwacha or 2.3 percent of gross domestic product (GDP) and it has been estimated that charcoal production provides full-time employment for about 41 000 people in rural areas (Ziba and Grouwels, 2017).

Charcoal can be made from virtually any organic material, including wood, straw etc. (Seboka, 2009). Among woods, usually the hardwood species are preferred for charcoal-making (e.g. *Acacia*, *mangrove*, *oak*, *beech*, *birch*, *hard maple*, *hickory* and *prosopis*) (Dlamini *et al.*, 2016; Gumbo *et al.*, 2013). The activities involved in charcoal production are; Tree selection, Tree felling, debranching into sizable logs, kiln construction, kiln monitoring, charcoal separation and packing (Gumbo *et al.*, 2013; Herd, 2007; Vos and Vis, 2010; Kazimoto, 2015). In the first stage of charcoal production, a production site close to roads and market places is identified, where preferred tree species of suitable diameter classes exist (Chidumayo 1997; Malimbwi *et al.*, 2005; Herd 2007; Syampungani 2008 cited Gumbo *et al.*, 2013). Tree selection involves the sighting and selection of preferred tree species that provide good quality charcoal when burnt and therefore are cut for charcoal production (Vos and Vis, 2010). The next stage is the preparation of stems and trunks for kilning, which involves cutting down whole trees (using an axe, or burning the base when the trees are very large) and de-branching and/or crosscutting selected trunks and branches into sizable logs which can be stacked compactly in a pit or on the ground and the stack is covered with straw or other vegetation and then buried under a layer of soil (Herd, 2007; Lurimuah, 2011; Gumbo *et al.*, 2013). Lastly, a typical kilning process includes construction of a kiln base; bigger logs are covered with smaller, stem-sized logs facing the same direction and then finally covered

by stems of an even smaller diameter, grass and mud (Gumbo *et al.*, 2013). The kiln is covered with soil to avoid complete burning of the wood as observed by Kazimoto (2015). The process of burning the kiln is started by lighting a fire in the ignition chamber at the base of the kiln and once the fire has taken hold the opening is sealed to exclude air, after which constant monitoring is required to ensure an efficient burn by controlling airflow by opening and closing vents (Herd, 2007). The burning takes some days and when burning is completed, the kiln is allowed to cool down. Final activities include unpacking the kiln, cooling and bagging the charcoal, and finally transporting it to the market (Herd 2007). The packing is usually done by tying with fiber and twigs in synthetic bags. Common means of transport are, wheelbarrows, ox-carts, bicycles, sledges and trucks (both open or containerized) of different capacities (Gumbo *et al.*, 2013).

2.7.2 Gender Roles in the Charcoal Value Chain

According to Jones (2015) roles in charcoal production are often separated by gender. Studies have shown that both women and men participate in all the stages of charcoal production (Smith, Hudson and Schreckernberg, 2017: Jones, Ryan and Fisher, 2016:). Women's involvement in the traditionally male dominated industry has increased across the country in recent years. It has also become increasingly common for women to engage in the stages of charcoal production. This can include everything from packaging to molding kilns, and even felling and cutting trees as revealed by Ihalainen, Mwale, Moombe, Gumbo, (2018). In as much as this may be the case, there are marginal differences in the dominance of a particular gender in the stages of the charcoal production process. For example, the physical nature of many activities associated with charcoal production has certainly played a role in shaping ideas of what is and isn't suitable for women (Baumert *et al.*, 2015: Kazimoto 2015: Ihalainen, Mwale, Moombe, Gumbo, 2018:). As well as gender differentiated access to, and ownership (tenure) of land, forests, trees, farms, products and labor (Haverhals *et al.*, 2016). Haverhals *et al.*, (2016) further states that women often have fewer or less favorable access rights than men, and if they have such rights, these are often not well defined or enforced. As a result, some studies like that of Pike (2012) have found that men were more heavily involved in tree cutting and tree burning as they are predominant land owners and so they also own the tree.

According to Haverhals *et al.*, (2016), factors of social differentiation such as education, marital status, age and ethnicity shape men's and women's participation in FTA value chains which is equally true of the charcoal value chain. For example, other studies (Ihalainen *et al.*, 2018: Pike,

2012: Kazimoto, 2015: Herd, 2007) have found that unmarried, widowed or divorced women were involved throughout the charcoal production cycle, while most married women said they generally played a supportive role to their husbands, sticking to activities perceived as ‘more suitable for women’. These kinds of jobs include packaging and selling charcoal, which are perceived as less physically demanding and easier to combine with childcare and other reproductive responsibilities (Ihalainen *et al.*, 2018: Pike, 2012). Due to the fact that gender roles and responsibilities are based on the local culture, men dominate in charcoal production as observed by Kazimoto (2015) and Herd (2007).

In the study conducted in Kenya by Pike (2012), it was revealed that women primarily do roles at the node of tree seedling planting, nurturing as well as selling charcoal while men were at the node of cutting and burning the tree. Similar comments to those of Pike (2012) were made by Kazimoto (2015) who indicated that women dominate in retail selling of charcoal. Chiteculo *et al.* (2018) also reported that charcoal is mainly traded in the markets and along the road side and women mainly represented the traders and they had a higher profit share along the charcoal value chain. Both men and women are involved in distribution in a relatively equal manner although large scale selling is heavily dominated by men who often have more access to capital (Pike 2012). Kazimoto (2015) revealed that there was a vivid male dominance in transportation of charcoal which involves travelling to remote production sites to collect charcoal and returning to the selling points as 80 percent of charcoal producers were males which is in agreement with Pike, (2012).

2.7.3 Opportunities Associated with Men and Women’s Entry into the Charcoal Value Chain

There are many factors that induce men and women to be engaged in the production and marketing of charcoal. Since 2012, Zambia has experienced increased load shedding partly due to inadequate investments in generation capacity, but more due to poor rainfall and a resulting decrease in generation given its heavy dependence on hydro-electric power (Dlamini *et al.*, 2016). This has raised the demand of charcoal in urban centers as it is a more affordable energy alternative.

Ultimately, the high demand for charcoal arising from load shedding guarantees economic sustainability of charcoal production (Dlamini *et al.*, 2016). This means that people affected negatively by load shedding resort to charcoal usage hence posting a high demand on the market.

According to Kammen and Lew (2005) charcoal has a higher energy density than other biomass fuels like firewood. This means that a smaller amount of charcoal can be used to cook food as compared to firewood thereby make it an ideal energy alternative.

With regards to degradation such as attacks by insects and bacteria, charcoal can be easily handled as it is durable and easy to store (Kammen and Lew, 2005).

It is considerably easier to disseminate charcoal on a large scale than fossil fuels, because there is a well-developed market and expensive infrastructure such as refineries and processing plants is not needed (Seboka, 2009). He goes on further by stating that charcoal production is a more distributed (locally-based) model of energy supply than fossil fuels. In developing countries, there is no developed market for fossil fuels, but charcoal is well distributed even in small villages because charcoal production can make use of locally-available waste resources (Seboka, 2009).

Women's entry into charcoal production can contribute to the process of transforming unequal gender norms and power relations in rural Zambia (Ihalainen, Mwale, Moombe, Gumbo, 2018). Charcoal production has low entry barriers (Ihalainen, Mwale, Moombe, Gumbo, 2018) and if undertaken appropriately, it is more environmentally sustainable and it reduces the need for imported fossil fuels which are relatively more expensive.

2.7.4 Challenges Faced by Men and Women in Charcoal Production and Marketing

According to Olarinde and Olusola (2018) the scarcity of trees for charcoal production results in a change in price that, the farther the distance from home to the production sites, the higher the transport charge. Although they are involved in charcoal production and marketing, women have high family responsibilities and cultural beliefs and low education level are some challenges that they face (Ngoo *et al.*, 2011). Tembo *et al.*, (2015) pointed out that the Zambian government gives higher priorities to increased access to modern and increased utilization of renewable energy through the implementation of its national energy policy which promotes the generation and transmission of hydroelectric power and enhancing access to hydroelectric power by poor households without alternative considerations such as charcoal. This has contributed to the current legalities of the charcoal value chain, which make it a lot harder for increased participation for both men and women.

Zulu and Richardson (2012) reported that the restrictions on legal charcoal production and trading in some African countries does not only reduce income generation but by driving charcoal into the informal sector they also expose small- scale producers to mistreatment, physical violence, seizure

of their produce or bicycles and extortion by corrupt police and forestry officials thereby increasing transaction costs and reducing net incomes. Additionally, Ngoo *et al.* (2011) revealed that charcoal producers face a challenge due to lack of clarity and due to conflicting regulation on charcoal such as the statement that “Charcoal making is illegal but use is legal”. Similarly, Mugo and Org (2006) highlighted that charcoal producers or members of Sudan charcoal producers` association complain of high taxes. Challenges faced by charcoal producers and traders include “high legal fees such as production and conveyance licenses paid to the Forestry Department, fees in terms of levies to local authorities such as district councils, tokens or bribes and hired labor” as observed by Gumbo *et al.* (2013).

It was revealed by Olarinde and Olusola (2018) that lack of transport to get their charcoal transported to where it could be demanded for or purchased was a challenge. Besides that, according to Gumbo *et al.* (2013) lack or shortage of packaging materials for charcoal was a challenge in charcoal production and marketing. In terms of recognition, charcoal is a marginalized fuel with least priority on national investments and there is lack of clarity and conflicting regulations on charcoal as charcoal making without a permit is illegal but charcoal usage is not illegal even without a permit.

2.7.5 Implications of Men’s and Women’s participation in Charcoal Production

Being a better energy alternative for poor people, the high demand for charcoal in urban and peri urban areas has led many in rural areas to consider charcoal production as a good livelihood option. Gender norms regarding the practice of charcoal production have been in favor of men for a very long time due to the patriarchal system that revolves around traditions across all rural settlements in Zambia, as such, male participation in the charcoal value chain is a normal and acceptable practice with relatively less problems, most of which are general problems of the business.

The situation is different for women however, mainly due to the sensitivity of gender roles especially those surrounding the household. It is clear though that the differential participation of women has an effect on the market as well as the households of the respective participants. For example, Ihalainen, Mwale, Moombe, Gumbo, (2018) highlighted that the entry conditions of women in the charcoal value chain tends to have certain social implications on the household. They state that in some cases the husband’s illness or alcohol abuse was the reason for engagement for a number of married women. This and similar cases where for example women sometimes feel pushed into charcoal production due to poverty and lack of alternative livelihood options has a

negative implication of the community's perception of the man of the house as the family provider (Ihalainen, Mwale, Moombe, Gumbo, 2018). They state further that a social trend has developed as a result, where if a married woman is involved in charcoal production, others may perceive it as a sign of the husband being unable to provide for the family. Which in and of itself is an entry barrier for married women who may wish to avoid such social stigma. Other issues have arisen with this trend, especially among men who have been found to complain about women's participation in charcoal production raising concerns like, some married women who earn income as a result have become disrespectful to their husbands, some say that women spend less time taking care of their families, others suspected that women were engaging in extramarital affairs when they were away from home selling charcoal (Ihalainen, Mwale, Moombe, Gumbo, 2018). This has led to the community view of women's general involvement in the charcoal business as 'home wrecking'.

Ihalainen, Mwale, Moombe, Gumbo, (2018) state that some married women say that their involvement in charcoal production and trade has gained them more equal control over income. While charcoal production and trade offers women higher incomes, greater autonomy and a sense of pride, many women are also paying a high social price for upsetting a patriarchal system – this despite the fact that both women and men view women's increased involvement primarily as an inevitable result of poverty (Ihalainen, Mwale, Moombe, Gumbo, 2018).

2.7.6 Environmental impacts in Charcoal Production

Large-scale charcoal production, primarily in sub Saharan Africa, has been a growing concern due to its threat of deforestation, land degradation and climate change impacts (Jones, 2015). As stated by Gumbo *et al.*, (2013) that, 'where charcoal is produced in quantity, localized deforestation has been noted'. He further states that charcoal production in Zambia is driven by urban demand, with a typical Lusaka household consuming an estimated 1.3 tons of charcoal per year. To produce this amount of charcoal, close to 8 tons of wood is required and the effects on forests have been noted as being largely negative (Mulombwa 1998; Hibajene and Kalumiana 2003 cited Gumbo *et al.*, 2013). The contribution of charcoal production to deforestation has been increasing steadily since independence in 1964 (Chidumayo and Gumbo 2010).

A study by Gumbo *et al.*, (2013) confirmed that poverty, lack of employment and limited livelihood options are major factors behind charcoal production. In the city of Lusaka, about 85 percent of urban households use charcoal, compared to 15 percent in rural areas (Technoshare

Associates 2011 cited Gumbo *et al.*, 2013). It can be deduced that increasing urbanization will result in greater charcoal demand and higher rates of deforestation (Gumbo *et al.*, 2013; WEC 2004). This issue becomes compounded when considering the low replanting rates and poor land management practices that have been identified across the many areas in Zambia (Jones, 2015). Various legislative gaps have been exploited by charcoal producers and, coupled with the ease of entry into the charcoal business, as well as limited monitoring by the Forestry Department, illegal activities around charcoal have not been actively discouraged (Gumbo *et al.*, 2013). Lack of resources; educational, financial or otherwise, has been cited as the major reason for such trends (Jones, 2015).

Foreseeable dependence on charcoal, despite drastic attempts to establish reliable electricity and fuel infrastructure, should raise a number of concerns regarding the sustainability of this essential industry in regards not only to its economic value, but the proper management of forest resources as well as livelihoods of those most responsible for producing this fuel. Lack of regulation and the use of conventional methods for production permeate the industry (Jones, 2015). However, ecological sustainability may not be attainable given that the standing stock in the natural forests and woodlands is declining. Further, if unabated this would worsen climate change impacts (Dlamini *et al.*, 2016).

In the past, the environmental impacts of charcoal production have received more attention than their contribution to livelihoods and poverty alleviation (Gumbo *et al.*, 2013). Solutions are therefore being sought on how to address deforestation and forest degradation so as to promote a sustainable charcoal production and marketing, thereby improving people's livelihoods. The extents to which charcoal production and marketing contributes to deforestation is not well documented.

A body of knowledge challenges the assumption that charcoal production leads directly to deforestation (Chidumayo 2010). Arguments against assertions that charcoaling causes woodland loss are associated with certain researchers like Gumbo *et al.*, (2013) who discovered that certain areas used for charcoal production for extended periods of time demonstrated the existence of sustainable, locally managed charcoal production systems. Stromgaard (1986) also postulated that woodlands could recover after clearing for charcoal and slash and burn, as evidence suggests that miombo woodlands do recover following removal of poles for charcoal production (Chidumayo 1997; Syampungani 2008; Syampungani *et al.*, 2009; Handavu *et al.*, 2011 cited Gumbo *et al.*,

2013). Hibajene and Kalumiana (2003) found similar results and, based on a number of assessments of the long-term viability of charcoal use, argued the regenerative capacity of miombo forests is sufficient to withstand degradation caused by charcoal production. Further, in Tanzania, Malimbwi *et al.* (2005) observed that areas of open and closed woodlands disturbed by charcoal production would progressively revert back to woody vegetation once production pressure was reduced. Other studies suggest even higher levels of production in miombo woodland ecosystems once disturbances have ceased (Geldenhuys 2005; Syampungani 2008). Some producers claimed that areas in their respective districts have been producing charcoal for up to 10 years without an immediate loss of the resource: such claims merit further investigation as stated by Gumbo *et al.*, (2013).

2.8 Gap in Literature

Much emphasis has been placed on increasing women's participation in the value chain without mention of increasing their benefits due their relative lack of capital. Clearly problems have been identified even where women dominate a value chain, making it apparent that the participation alone is not enough for women to obtain equal benefits as men from value chains.

Gender equality is presented as a moral imperative rather than a means of improving the efficiency of the charcoal value chains.

The ways men and women interact in the charcoal value chain has mostly been overshadowed by; an exclusive focus on women; considering women as a homogeneous rather than a differentiated group in terms of age, marital status and education. The focus on women rather than gender is excessive in most of the literature without considering the impact of single sex interventions: if women are supported what are the impacts on men and what are the longer-term changes in societal and market dynamics? An example would be the escalation of gender-based violence on women. A review by Ingram *et al.*, 2016 finds that existing literature on gender in FTA landscapes tends to be biased towards value chains in which women are already largely involved. Hence, much less is known about ways in which gender roles and relations in various contexts structure participation and outcomes in traditionally male-dominated value chains, including charcoal as well as the ways in which gender dynamics influence the socioeconomic and environmental impacts of the value chain.

CHAPTER THREE: DESCRIPTION OF THE STUDY AREA

3.1 Introduction

This chapter presents the description of the study area in terms of location, climatic conditions of the study area, vegetation and type of soil and Socio-economic characteristics.

3.2 Location of the Study Area

The study was conducted in Makunka area of Kazungula district in Southern province. Its coordinates are, UTM: MC 89. Latitude-15.433 and Longitude 26.817. Kazungula district is located in Southern Province of Zambia covering an area of approximately 15,873 Km² in extent (Phiri and Chisonga, 2013). It borders Botswana, Namibia and Zimbabwe in the south as shown in Figure 3.1. Its district boundaries include Sesheke, Kalomo, Itezhi Tezhi and Livingstone. The district has 14 wards namely Moomba, Chooma, Nguba, Kauwe, Nyawa, Ngwezi, Sikaunzwe, Mandia, Sekute, Kanchele, Simango, Musokotwane, Katapazi and Mukuni (Phiri and Chisonga, 2013). Makunka area is situated about 58 kilometers North-West of Livingstone city. It is located about 40 kilometers off Livingstone-Sesheke Road or Nakatindi Road. One part of the area is in Sekute chiefdom while the other part is in Musokotwane chiefdom.

Kazungula as a district is geographically divided into two; the lower lands (southern part) are prone to flooding and the upper lands (northern part) are prone to droughts. Nearly all the flood prone areas are in Chief Sekute's area (Phiri and Chisonga, 2013). The district has five traditional chiefs (Moomba, Sekute, Musokotwane, Nyawa and Mukuni) and these chiefs play a very big role in community social mobilization and decision-making (Phiri and Chisonga, 2013). The district is drained by the Zambezi River and forms the southern boundary of the district and is the only perennial river. Others are the Kasaya stream, Ngwezi stream, Kamadobe stream and Madivaidi stream which are seasonal. The district is also drained by a number of flood plains including the Nampian plains located in Sibbulo community (Phiri and Chisonga, 2013).

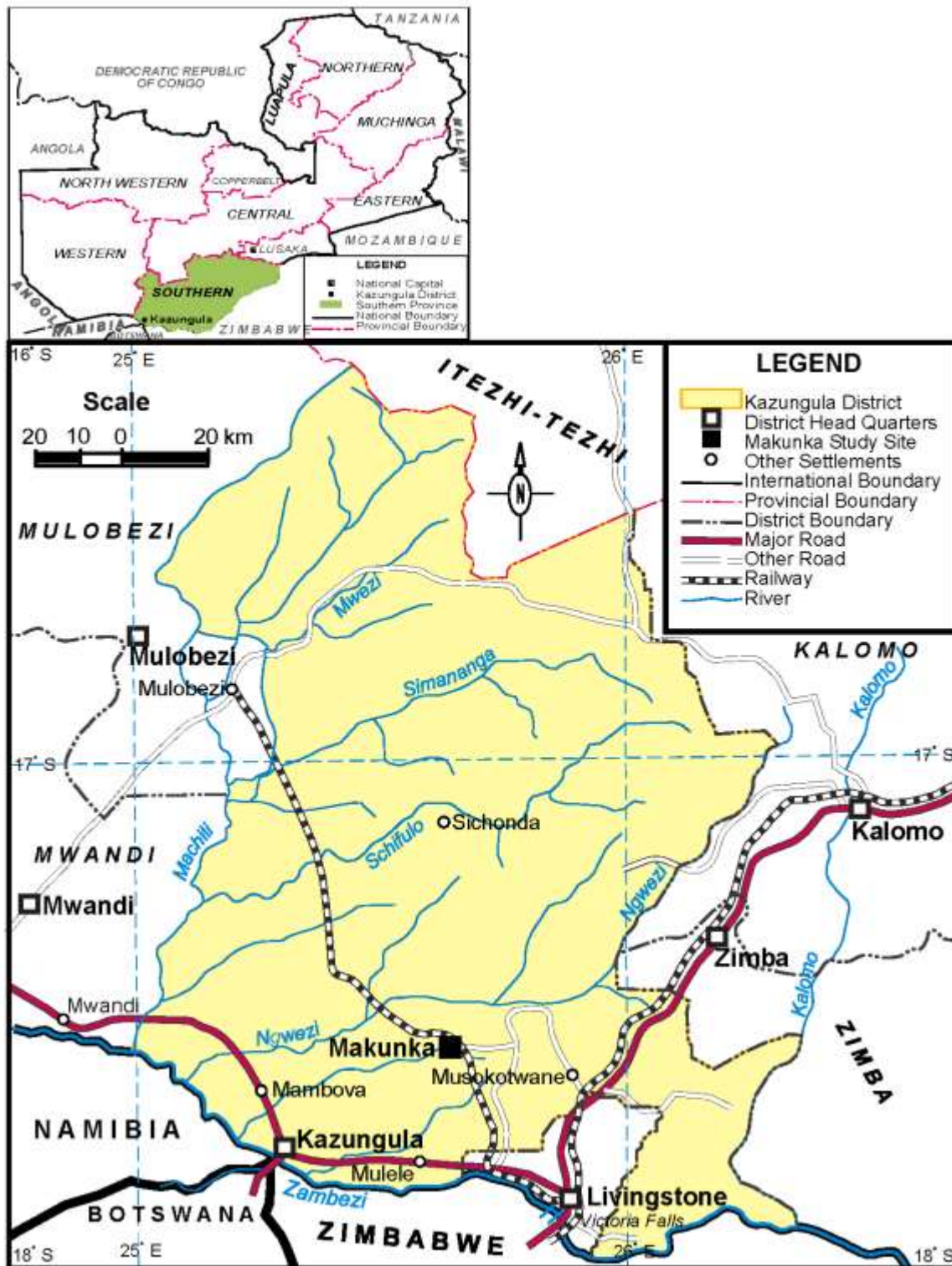


Figure 3.1: Makunka site in Kazungula district

Source: Adapted from UNZA

3.3 Climatic Conditions of the Study Area

Kazungula falls within the Agro-Ecological Region I (AER I), which is a semi-arid with the lowest annual rainfall in Zambia of less than 800 mm. Region I is considered a drought-prone/risk area (Phiri and Chisonga, 2013). The area has a single rainy season, between the months of October and May with higher rainfall often recorded for the months of December and January with an annual average of 600mm per annum (Metrological Office of Zambia, 2009). Agro- ecological zone 1 has the lowest agricultural potential as it has a medium to high risk of drought (Turpie *et al.*, 2015). Floods are also increasing in their frequency. Combined with other characteristics of climate change, drought and floods are leading small-scale farmers to become more vulnerable to household food insecurity and poverty in the district. Food shortages and hunger are common in the area (Phiri and Chisonga, 2013). During poor crop yield due to poor rainfall, people resort to selling fuel wood/charcoal, livestock and they turn to small business for an alternative income (Phiri and Chisonga, 2013). The exploitation of forest resources through the production of charcoal leads to rapid forest degradation and loss of other services from the natural resources on which the community depends; it is an effective coping mechanism only in the short term (Phiri and Chisonga, 2013). Although there is an awareness of the problems created by charcoal production, lack of alternatives and will on the part of the community leadership to address this situation. With the increasing pressures from climate change, continued forest loss and land degradation will continue and progressively weaken the adaptive capacity, leading to a vicious cycle of worsening impacts, loss of livelihood options and increasing poverty (Phiri and Chisonga, 2013).

3.4 Vegetation and Type of Soil of the Study Area

Kazungula is richly endowed with forests. Forests range from mopane woodlands, miombo woodlands to riparian forests including open grasslands (Phiri and Chisonga, 2013). The vegetation communities are mainly deciduous and comprise of woody species such as *Colophospermum mopane*, *Burkea*, *Combretum*, *Parinari*, *Terminalia* and *Acacia*, as well as *Adansonia digitate* (Karidozo and Osborn, 2015). The area has a lot of trees or woodlands that favored charcoal production. Makunka area of Kazungula district has Mopane and Munga woodlands (Chidumayo, 2017). Similarly, Lyons *et al.*, (2004) reported that the area has short grass and scattered Mopane trees. The Mopane species is the most desirable tree species for the production of good quality charcoal in the area because it is hard. The vegetation in Kazungula District ranges from Savannah grasslands to Miombo woodlands (Zimba, 2013). Valuable tree

species are mostly conserved as they provide fruit, forage, firewood and improvement of soil fertility (Phiri and Chisonga, 2013). Tree species also provide firewood which almost all households depend on for their energy needs. Charcoal production is mainly for Household domestic use or selling and the overall trend of the charcoal value chain is one of increasing production, related to the increased demand from growing urban centers like Livingstone (Phiri and Chisonga, 2013). Although traditionally, access to and use of forest products is regulated through community leadership structures (Chiefs and headmen), there is a massive challenge of uncontrolled and often illegal charcoal production with large numbers of locals involved including headmen benefiting from the huge and lucrative market for charcoal in Livingstone and other surrounding towns in the province (Phiri and Chisonga, 2013).

In terms of soil type, Chidumayo (2017) reported that the area has Kalahari-sandy soils and plateau- loamy soils. The district lies predominantly on hydromorphic sand plain soils covered by miombo woodlands in the highlands and mopane woodlands in the low lands (Lyons, 2002). The main soil groups are the vertisols, acrisols, luvisol- phazem, lithosols, and fluvisols. The soil physical limitations include low water holding capacity, shallow rooting depth, rapid physical deterioration and erosion (Zimba, 2013). Chemical limitations of the soil include low nutrient reserve, low nutrient retention capacity, high acidity in some pockets and low organic matter. Deforestation is common in the district as the locals deplete the forest for firewood, charcoal burning and farming. The worst deforested areas are found in the southern wards of Moomba, Sekute, Mukuni, Ngwezi, Kanchele, Musokotwane, Kauwe and Sikaunzwe (KDDP, 2005 cited Zimba, 2013).

3.5 Socio-Economic Characteristics of the Study Area

Makunka area has one part in Sekute chiefdom while the other part is in Musokotwane chiefdom. The area has thirty villages. The population density of Makunka area is 5.4 which is 5 people per square kilometer to the nearest whole number. The tribes that are found in the area are Tonga, Toka-Leya, Lozi and Luvale. However, the majority of the people are Toka-leyas and so the common language used is Toka-leya. Other languages used in the area are Nyanja and a bit of English. The 2010 population estimate for Kazungula district was 98,292 (49% males & 51% females). The population of 2000 was at 68,255 giving a population growth of about 3.7 percent (CSO, 2010)

The chiefs in the area command more respect and authority than political leaders. According to Shankwaya (2009) the chiefs in the area have more power over political, Judiciary and social issues, the chief also through the village headpersons play a major role in community social mobilization and decision making and finally the chiefs have the power to change community behavior towards the use and management of Natural resources. In the study area the two chiefs are represented by the two senior headmen who are appointed by the chief through the chief's council. The senior headmen are viewed to be more knowledgeable of the land issues, Culture and leadership than other village head persons and are in charge of all the village headpersons in the area under his control. Succession to chieftaincy or village headperson is through a recognized lineage of a clan. According to Lyons *et al.*, (2004) the largest portion of land in the study area is under the traditional land tenure system with use and occupancy rights allocated by chiefs through village headpersons.

Makunka area has no processing industry and so there are very few employment opportunities either in the public or private sector. Therefore, most of the people are not in formal employment. The main economic activity is agriculture whose output is influenced by climatic conditions (Shankwaya, 2009). People in the area are involved in arable and pastoral farming on a small scale where by the production is mainly for home consumption. They grow maize, millet. Cowpeas, groundnuts, sorghum and keep cattle, pigs, goats, sheep and poultry. Households produce only 26 percent of the food consumed and cope with shortages by reducing daily meals and other household items or substituting normal meals with natural fruits (Sawka *et al.*, 2013). Phiri and Chisonga, (2013), revealed that women took a leading role in matters concerning water like drawing water for household use (bathing, drinking, cooking, and gardening). Men led in herding animals towards drinking water. Due to low income and agricultural production, some men and women are now involved in charcoal production and marketing as their main source of income. The area has no industries and so there is very high unemployment. The type of energy used for cooking and space heating is wood energy in form of firewood and charcoal.

The roads in the area are not in good condition. They become muddy and sandy during the rainy season and dry season respectively. The muddy and sandy states of the roads coupled with a lot of pot holes negatively affects the transport sector in the area. However, the area is serviced by an unreliable Mulobezi train which passes through the study area twice in a week. The train sometimes takes 2 to 3 days to reach Livingstone due to the poor state of the railway trucks. In

terms of communication networks, the area is serviced by both MTN and Airtel mobile communication network providers. Charcoal producers and marketers communicate to their customers using any of the two communication networks.

CHAPTER FOUR: METHODOLOGY

4.1 Introduction

This chapter looks at the processes and techniques of the research study by focusing on the methodology that is used to carry out the study at hand which is, gender roles and their implications in charcoal production and marketing in Makunka area of Kazungula, Zambia.

4.2 Research Design

A case study was chosen because, as a research method, it offers richness and depth of information not usually offered by other methods as it is a highly versatile research method which employs any and all methods of data collection from testing to interviewing (Hancock 2001). Seeing as there is limited knowledge on the subject under study, a case study can help bridge the gap by producing novel hypotheses which can be used for later testing or further research.

4.2.1 Target Population

The target population for this study consisted of charcoal producers and marketers living in Makunka area. The population was drawn from eight out of thirty villages that make up Makunka area. The eight villages were considered for this study because charcoal production and marketing activities were mainly done in these villages. The eight villages were Sievu, Kambwe, Gunzwe, Dube, Simanyungu, Simunji, Siakwai and Kawewanyana. The key informants were two officials from the Livingstone Forestry Department. It was hoped that the key informants would provide the study with some data on charcoal production and marketing trends.

4.2.2 Sampling techniques

The study utilized purposive and snowball sampling techniques.

4.2.2.1 Purposive Sampling

This type of sampling was utilized by the researcher in the selection of the eight villages in which charcoal was produced on a large scale. The sampling method permitted the researcher to select the eight information rich villages and helped to avoid wasting time to go to areas which did not produce much charcoal. The researcher also used this sampling method to select the two key informants for the study from Livingstone Forestry Department who had an understanding of charcoal production activities in Makunka area. This is because Livingstone Forestry Department is the nearest office where charcoal producers and marketers would get production and conveyance

permits if needed to do so. Additionally, charcoal from Makunka area is transported to Livingstone for selling and not Kazungula as Kazungula boarder is far away from Makunka area. Purposive sampling was ideal as it helped secure respondents who were reliable and relevant to the study.

4.2.2.2 Snowball Sampling

Snowball sampling involved asking participants who had already been selected for the study to recruit other participants. Using Snowball sampling method, the researcher intentionally targeted a group of people who were believed to be reliable for the study.

The population of the charcoal producers and charcoal sellers in the sampled villages was not known as village head persons did not have registers for charcoal producers and marketers in their villages. This sampling method enabled the researcher to have a sample of people engaged in charcoal production and marketing by identifying one of them and then he or she would mention another one up to when there were 60 respondents.

4.2.3 Data Collection Methods

The study utilized semi-structured interviews, focused group discussions and observations. Data was collected by the use of semi structured interview schedules. These were effective for securing answers to questions using a form which the respondents answered orally while the researcher wrote down the responses. Secondary data were collected from peer and non-peer reviewed journal articles, magazines, textbooks and newspapers.

4.2.3.1 Semi- Structured Interview Guides

Semi-structured interviews are most often used in qualitative research. In this type of interview, the interviewer asked the important questions the same way across informants but had room to probe and alter the sequence of questions. The researcher prepared the research instrument to the level of comprehension and articulacy of the respondent and considered the fact that in responding to a question, people also provide answers to questions that were going to be asked later. When using the above instrument of data collection, the researcher developed and used an 'interview guide.' This was a list of questions and topics that needed to be tackled during the conversation in a specific order. The data collection instrument was used in this study because it enabled the researcher to prepare questions ahead of time. Semi-structured interviews also allowed the respondents the freedom to express their views in their own terms during the course of the

interviews. The instrument also permitted the researcher to obtain data that would be missed by questions in the guide.

4.2.3.2 Focus group discussion

The Focus group discussion enabled the researcher to collect quality data that helped to understand gender roles and their implications in charcoal production and marketing from a group setting. Three focus group discussions were held. The first group was made of women only so as to give the discussants freedom of expression in the absence of men. The second group was made of men only and the third group discussion was made of men and women in order to get balanced views. The respondents expressed their thoughts, feelings and experiences about gender roles and their implications in charcoal production and marketing in the eight villages of Makunka catchment area.

The researcher introduced the questions one by one. He provided probes and pauses so as to allow the interaction of the group members. Each group had eight discussants and took an average of 30 minutes to one hour. During the discussions the discussants were free to use either Chitonga or Toka-Leya for them to express their responses freely.

4.2.3.3 Observation

This technique involved the researcher spending periods of time in each of the eight villages of Makunka area, in order to understand charcoal producers and marketers' lived experiences in the context of their everyday lives. Observation allowed the researcher to systematically note and record events, behaviors and artefacts in a social setting. This technique relied on the researcher's ability to interpret what was happening and why. It involved sharing life experiences among the charcoal producers, marketers and the researcher. Observations were conducted from September to the first week of November, 2017 in Makunka catchment area. The researcher covertly observed the production and marketing processes of charcoal within the surroundings. This served as a foundation for the researcher's actual observation and provided him with some useful contacts in the Makunka catchment area. The researcher observed overtly by revealing his intentions to the participants right from the beginning. The researcher attempted to build rapport with them by assuring them of the importance of their experiences or views and his willingness to learn from them, seeing things their way. This worked as evidenced by his participants' willingness to share their stories, highlighting their challenges, joys, hopes and dreams – some that were very humbling

and that he sometimes felt was not entitled to. Apart from the various interview appointments that were scheduled, the researcher regularly walked about in the catchment area, visited other households and in the process had many informal conversations that would provide him with much contextual insight into the lives of the charcoal producers and marketers. This method also helped the researcher to understand how charcoal production and marketing was influenced or affected by gender roles.

4.2.4 Data analysis

The data collected was analyzed by using thematic data analysis. During the analysis the researcher identified the themes that emerged from the data collected. After the themes were generated, they were reviewed and the frequency of the themes noted as it showed how that particular theme was important pertaining to gender roles and their implications in charcoal production and marketing. Finally, the themes were defined and named accordingly. This data analysis method was suitable for analyzing data on gender roles and their implications in charcoal production and marketing in Makunka area as it helped to bring about an understanding of charcoal producers and marketers' everyday experiences and reality of the charcoal value chain.

CHAPTER FIVE: FINDINGS AND DISCUSSION

5.1 Introduction.

This chapter presents the information gathered from participants on the gender roles and their implications in charcoal production and marketing in Makunka area of Kazungula district. The information includes, background information of the respondents, roles performed by men and women in charcoal production and marketing, licenses for charcoal production, opportunities for engaging in charcoal production and marketing in Makunka, challenges associated with charcoal production and marketing in Makunka and the implications of gender roles in charcoal production and marketing in Makunka area of Kazungula district.

5.2 Background Information of the Respondents

This section of the study presents the background information of the 60 respondents, which include age, sex, marital status and level of education.

5.2.1 Age Range of the Respondents

In order to know the age range of the charcoal producers and marketers in the study area, the respondents were asked to write their ages. The results were as shown in Figure 5.1.

Most of the participants in the study area were aged between 31 and 40 years. The relevance of this in the study was that this age group was mostly very much occupied with the responsibility of looking for money for school fees and other basic needs of their families. The second highest age group was that of 21 to 30 years. The age groups below 20 years and above 50 years had few participants because charcoal production is a labor-intensive activity and also because of the fact that most of those below the age of 20 were still in school for their education as well as lacking the energy required while those above 50 years were simply lacking the needed energy for the activity. The findings are similar to studies conducted in other countries such as the study by Olarinde and Olusola (2018) in Nigeria who reported that most of the people involved in charcoal production are those in the active age group range of about 30 to 50 years. Similar findings are reported by Lurimuah (2011) that the majority of charcoal producers were in the age range of 30 to 39 years as the charcoal production activity needs extensive manual labor. In the study by Herd (2007) in Mozambique, the age group range 22 to 35 years dominated charcoal production.

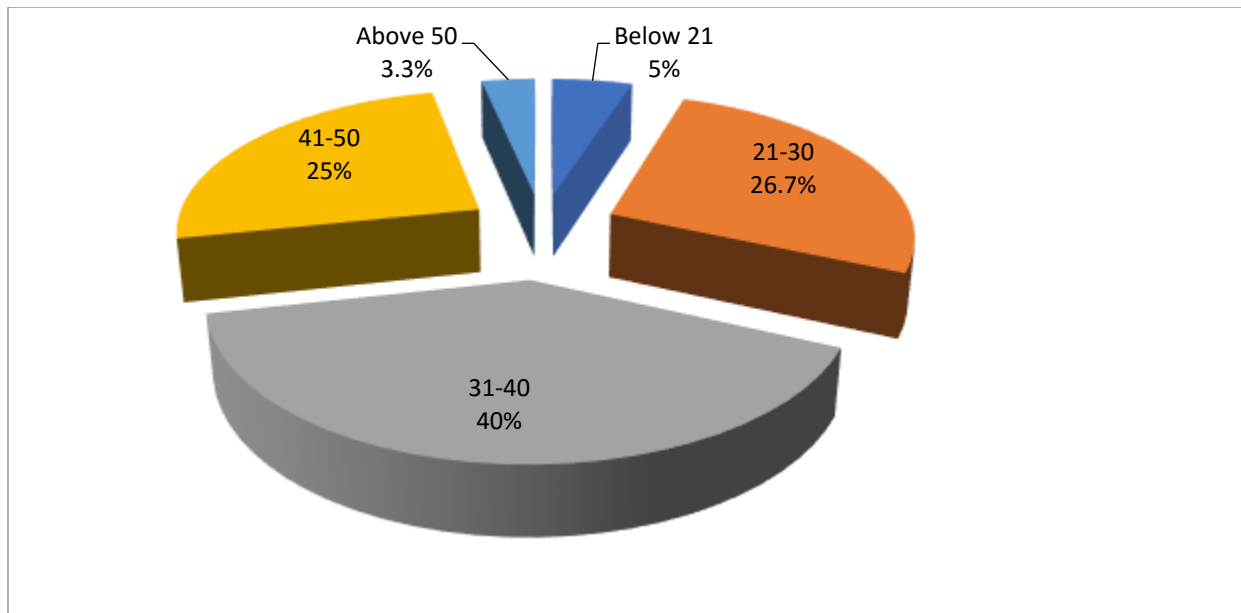


Figure 5.1: Age range of the respondents.

Source: Field Data, 2018.

5.2.2 Gender of the Respondents

As the study was focused on determining the gender roles and their implications in charcoal production and marketing, it was necessary for the researcher to look at gender in the distribution of the participants in the study who happened to be the charcoal producers and marketers. The results showed that 58.3 percent (35) of the respondents were men while 41.7 percent (25) were women. In order to establish why there were more men participating in charcoal production and marketing than women in Makunka area despite the call for gender equality in development, the researcher asked the participants to state the reasons for such a scenario. Responding to the question asked, 73 percent of men participants and 55 percent of women participants in the study reported that some women do not engage in charcoal production as the activity is viewed by some people to be an activity for men. This reason might have contributed to the smaller number of women participating in this rural based livelihood activity. In addition, 27 percent of the men participants and 45 percent of the women participants reported that other men and women were doing other income generating ventures apart from charcoal production and marketing such as illegal timber production and marketing for men while women collected wild fruits for sale as a source of livelihood.

5.2.3 Marital Status of the Charcoal Producers

The results show that most of the charcoal producers and marketers in the study area were married as shown in Figure 5.2. None of the respondents were separated.

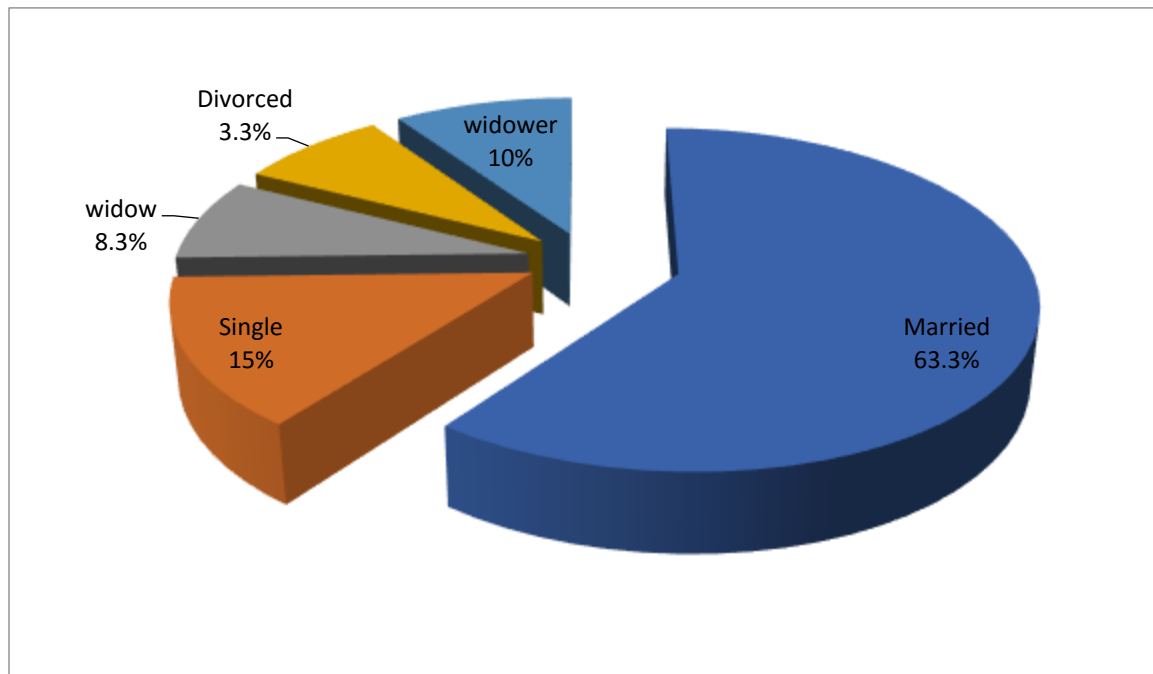


Figure 5.2: Marital status of the participants.

Source: Field data (2018).

5.2.4 Respondents Level of Education

Half (50%) of the respondents had attained upper primary education and the least number had attained tertiary level of education (Figure 5.3). The results obtained compelled the researcher to pose a question as to why the situation was like that? The reasons given were: Those with primary and junior secondary education lack other sources of income in the area as farming was only possible during the rainy season forcing them to participate in the production and marketing of charcoal. For those who attained senior secondary education, they reportedly took part in the charcoal business so as to raise money in order for them to go for specialized training while those who attained tertiary education were in the charcoal business as a way of supplementing their low incomes. Similar findings are reported by Olarinde and Olusola (2018) and Tesot (2014) that the highest percentage of people 43 and 45 percent respectively, of the respondents had attained primary education.

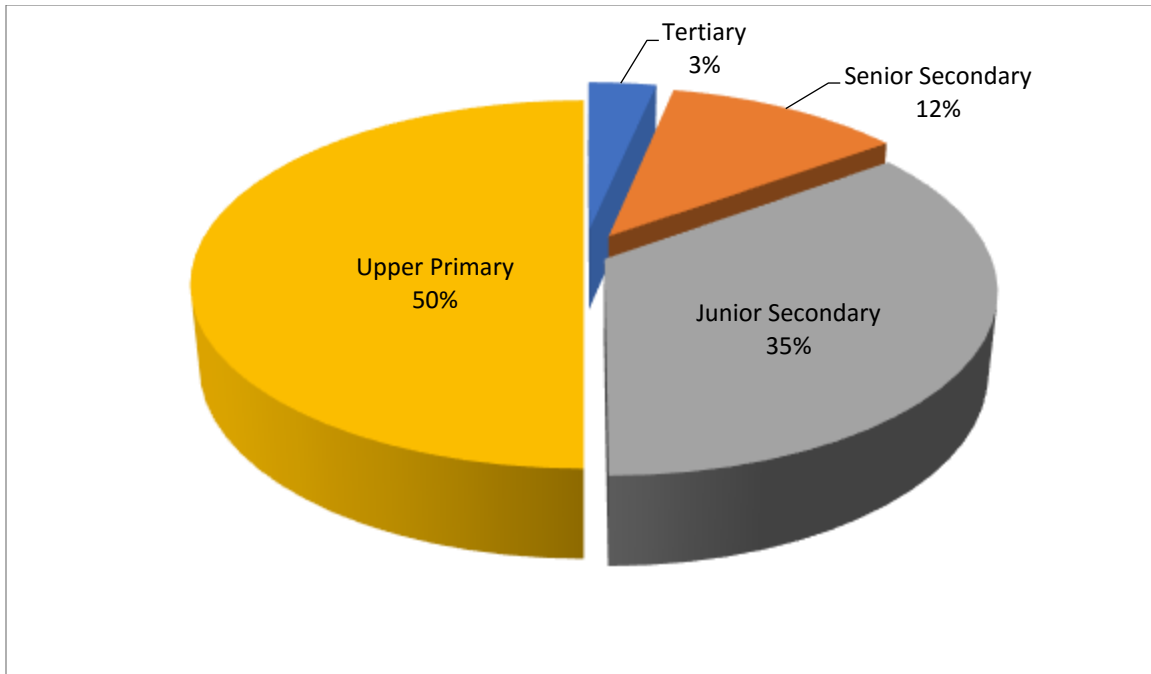


Figure 5.3: Respondents' level of education

Source: Field data; 2018

5.3 Roles Performed by Men and Women in Charcoal Production and Marketing.

This section of the study presents the views of the 60 respondents drawn among men and women charcoal producers and marketers in Makunka area and two key informants from the Forestry Department on the roles performed by men and women in production and marketing of charcoal. In order to find out some roles played by men during the production and marketing of charcoal, the participants in the study were asked to state what roles men carried out in charcoal production and marketing. Responding to the asked question, 25 women expressed a similar view that there were no restricted roles.

As it was the center of the whole study to establish the gender roles in charcoal production and marketing in the study area, the researcher asked the respondents to state whether there were roles done by both men and women during charcoal production and marketing. The response that was given out was a 'yes'. When further probed to mention some of the gender roles in charcoal production and marketing performed by both, the participants gave diverse views as shown in Figure.5.4.

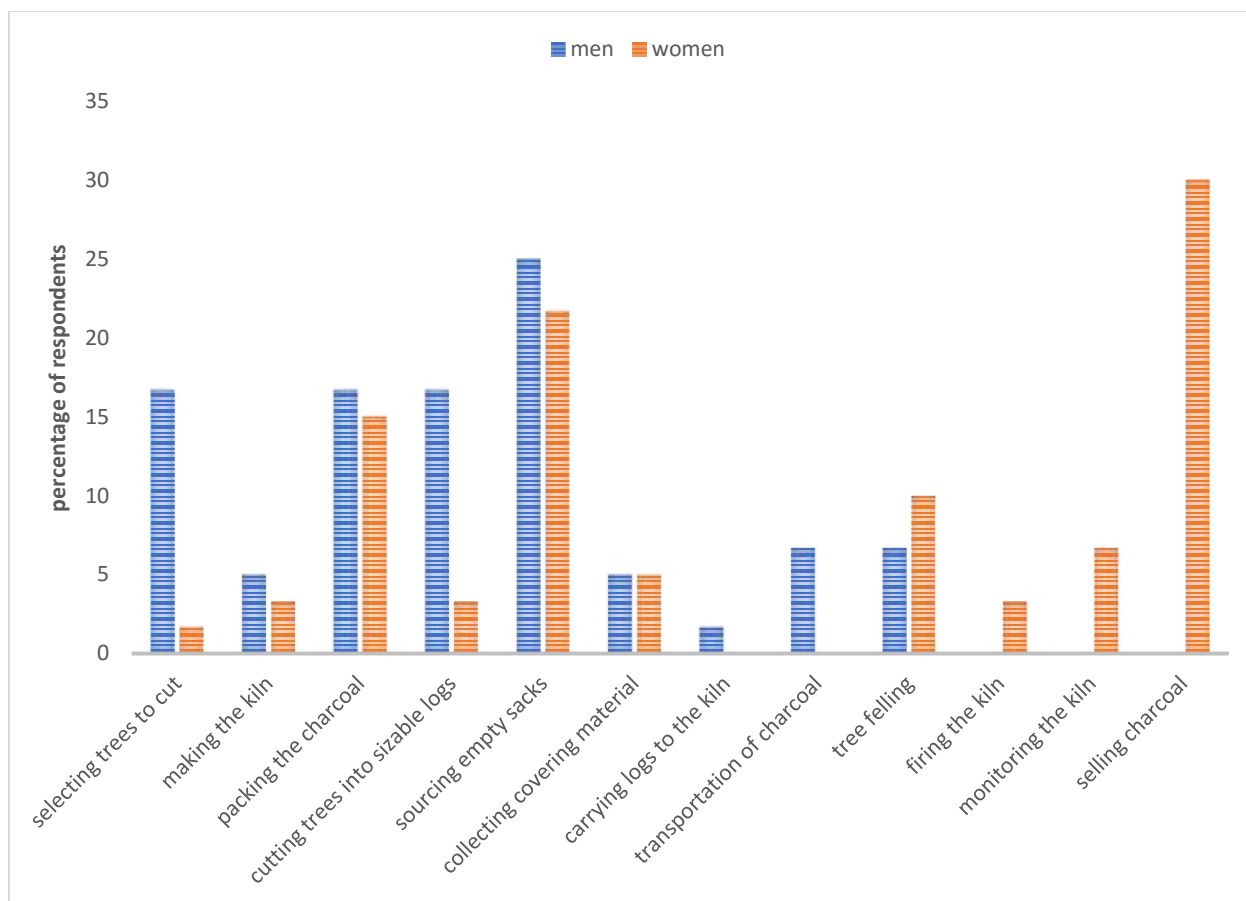


Figure 5.4: Gender roles in charcoal value chain in Makunka area

Source: Field data (2018).

Men dominate in looking for or sourcing empty used bags of cement, mealie meal etc. which are used to pack charcoal. Though sourcing bags scored highest for men, a large proportion of women did that as well which scored second after selling charcoal. The difference is because men take advantage of finding themselves in Livingstone city where they normally take their charcoal for sale and since the said type of empty bags are sometimes found in places where construction is taking place. After selling charcoal they buy these empty bags at ZMW 1.50 or ZMW 2.00 each. On the contrary, women do not dominate in this role as they do not have enough time to look for bags from faraway places since they are to do some nurturing roles of caring for the children and cooking meals for the family among others.

When it comes to separating charcoal from the covering materials and packing charcoal into empty bags, male dominance is not that significant as both men and women were almost equally involved.

Not less than 70 percent of the respondents reported that the role does not require much strength. The findings are contrary to Luz *et al.*, (2015) who reported that in their area charcoal production is mainly carried out by men.

Women were by far more involved in charcoal selling than any other role along the charcoal value chain. It was found that women alone were involved in the selling of charcoal. The reason for this as revealed in the study was that most of the men entrusted their wives to be selling charcoal and safely keeping the money for future use (Plate 5.1). For instance, one respondent said,

I told my wife to be selling charcoal and keep the money and a record of how many bags had been sold and how the family had used the money made from charcoal sells. When I need money for either buying air time for my phone calls and some beer on the days that I go for beer drinking, I have to ask from her. What I do is just be with her when packing so that I know the number of bags that we have produced to give a directive that no discount will be given to the buyers as this can make my wife become dishonest in terms of finances.



Plate 5.1: Man discussing with wife about selling charcoal and keeping the money for future use.

Source: Field Data, 2018.

Men dominated significantly in the cutting of trees into sizable logs while women were found to dominate in tree felling due to the use of fire as compared to men who were using axes. The finding on men leading in the cutting of trees using an axe is consistent with Luz *et al.*, (2015) who reported

that charcoal production was mainly carried out by men due its labor intensity. When asked as to why women were using fire to cut down trees, 90 percent of the women respondents reported that it required less labor and was faster as opposed to using an axe. This is because one woman can set fire on about 10 trees in a day and all of them can fall down within the same day (Plate 5.2). They further indicated that it can take maybe four days to cut such a number of trees using an axe.



Plate 5.2: A woman using fire to cut trees

Source: Field data, 2018.

Men alone were involved in transporting charcoal from the production sites to the market or to the customers. The research revealed that only about 20 percent of the men were involved in the transportation of charcoal. An inquiry was made as to why men were the only participants in this role, 80 percent of the respondents reported that women, according to the culture in the area were rarely allowed to handle animals like yoking oxen and repairing bicycles or vehicles as well as spending nights on the road whenever there was a break down. This can be the case whenever a breakdown is experienced as mostly vehicles which are not fit to be on the road are used to transport charcoal since the driver cannot demand for high transport charges. Plate 5.3 shows a number of men transporting charcoal using vehicles. This finding is in agreement with Malimbwi *et al.*, (2011) who reported in Tanzania that old age of most charcoal transporting trucks results in

unreliability and frequent vehicle breakdown during transport. Similarly, Kazimoto (2015) revealed that there is vivid male dominance in charcoal transportation which involves travelling to remote production sites to collect charcoal and returning to the selling points.



Plate 5.3: Men transporting charcoal to the market.

Source: Field Data, 2018.

In order to find out the roles performed in charcoal production and marketing; the two officers were interviewed separately so as to give chance for each officer to respond to the questions without being influenced by the other friend. The first key informant mentioned five roles that were performed by both men and women. He outlined the roles played by both men and women as sourcing empty bags, making charcoal kilns, transportation by vehicles, packaging and monitoring the kilns during burning. The second key informant indicated that cutting down trees, cross cutting them and carrying the pieced logs to the kiln site was mainly done by men. The second key informant also listed the following as tasks performed by both men and women: cutting of trees, making kilns, sorting out charcoal from covering materials, and marketing (selling).

5.4 License for Charcoal Production

The results showed that most of the charcoal producers and marketers in the study area were engaged in this economic activity without a license or legal documentation which allowed them to operate in the charcoal value chain. A large majority (93.1%) of the women and men (92.7%) had no charcoal production licenses. The researcher further probed the respondents that had no licenses to explain why they had no legal document. In response 76 percent of the men and 83 percent of the women said that they had no licenses for charcoal production because the licenses were very expensive as the licenses were sold at ZMW 20.50 per 50-kilogram bag of charcoal. A few of the respondents (10% of the women and 7% of the men) claimed that they were not aware of the need for a license to produce and sell charcoal. They asserted that “God gave people trees to be using as they so wished without having any legal document”. In short, forests in Makunka area are treated as natural capital for everyone to use regardless of what happens to it after extracting the forest product. Others contended that they had no licenses because this would limit the number of bags to be produced as the license shows the number of bags that a producer should produce. Additionally, All the respondents noted that the absence of Forestry officers from the study area was one reason for not having the legal document for doing charcoal business in the study area.

5.5 An opportunity for Women and Men to Engage in Charcoal Production and Marketing in Makunka.

The charcoal producers and marketers recognize some opportunities that exist for engaging in charcoal production and marketing in the study area. High demand for charcoal especially in urban

areas was seen as an opportunity for men and women to participate in charcoal production and marketing (Table 5.1).

Table 5.1: Opportunities for charcoal production and marketing in Makunka

Opportunities	Men in (%, n=35)	Women in (%, n=25)
High charcoal demand	83	66
Issuance of permits	100	100
Few people can bear challenges	51	62
Forest or tree regeneration	73	79

Source: Field data, 2018.

5.5.1 High Charcoal Demand

It was reported by the majority of the men and women that the high demand for charcoal in Makunka area and Livingstone city was an opportunity for men and women to get involved in the production and marketing of charcoal. They reported that due to rural – urban migration, there is a population increase in Livingstone. Additionally, the increase in population has brought about the existence of informal settlements in which most poor people who provide the charcoal sector in the market reside. The interviewed men and women indicated that most of the people in such areas resort to charcoal usage as they cannot afford paying for the high electricity bills since most of them are not in formal employment. The findings are consistent with Dini (2006) who indicated that poverty and unemployment influence charcoal production and usage. In addition, the findings are in agreement with Zulu and Richardson (2012), Kazimoto (2015) and Ziba and Grouwels (2017) who reported that wood policies in Sub-Saharan Africa have focused on supply enhancement, demand management, a large ready market for charcoal to absorb the entire production and that the charcoal demand has been increasing from 13,900 tonnes in 2008 to 1,500,000 tonnes in 2015 in Zambia. This high charcoal demand gives men and women in Makunka area hope that their charcoal can be bought.

5.5.2 Issuance of Permits

All the men and women thought that the issuance of both production and conveyance permits by Forestry Department was an opportunity for legal charcoal production and marketing in the study area. It is an opportunity for some charcoal producers and marketers who can manage to pay for the permits but for those who cannot afford the permits as is the case for most of the respondents,

it can be a challenge. This finding is in line with the Ministry of Environment, Water and Natural Resources (2013) which indicated that to transport more than three bags of charcoal, one has to get a movement permit from a Forestry officer. The issuance of the permits is done throughout the year and so it becomes an opportunity as it does not restrict charcoal production and marketing to a certain season of the year. The finding is also in agreement with Ngoo *et al.*, (2011) who reported that the forest policy of Tanzania promotes equal access and use of forest resources. Additionally, the finding is in line with the Zambia Forestry Act of 2015 which says that the cord- wood permit given to a person allows such an individual to harvest or use wood for firewood or charcoal production. A similar report is given by Jones *et al.*, (2015) that in their area in Liberia the local regulatory framework is a key enabling factor which allows easy entry into the production sector. Gumbo *et al.*, (2013) also reported that to produce charcoal individuals need production and conveyance licenses. Barriers to entry into the sector were perceived to be an opportunity for others as this limited competition.

5.5.3 Regeneration of Trees

A majority of the respondents noted that the regeneration of the tree after it has been cut was an opportunity after some time for charcoal production and marketing. The finding is in conformity to Malimbwi *et al.*, (2011) who reported that if a woodland stand is cleared for charcoal production and abandoned to regenerate, it will regrow virtually unchanged in species composition (Plate 5.4)



Plate 5.4: A man harvesting regenerated trees for charcoal production.

Source: Field Data, 2018.

5.6 Challenges Associated with Charcoal Production and Marketing in Makunka

A number of challenges were identified by the respondents and tabulated as shown below.

Table 5.2: Challenges faced by charcoal producers and marketers in Makunka.

Challenges	Men in (%)	Women in (%)
Poor market structure	59	55
Demanding too much labor	100	100
Lack of empty bags	78	70
Health problems	100	100
Lack of government support	63	52
Depletion of desired tree species	70	64

Source: Field data, 2018.

5.6.1 Poor Market Structure

The results showed that 59 percent of the men (n= 35) and 55 percent of the women (n= 25) reported that they faced a challenge of poor market structure (table 5.2). When asked to state the reasons that could have fueled the reported challenge, all the men and women respondents indicated that there were a lot of people who were involved in charcoal production and marketing in the area. This in turn caused or resulted in high charcoal production and supply in the area and Livingstone city hence the poor marketing system. One respondent reported that “the *marketing problem also comes into existence because there is no organization or association that is in place to fix charcoal prices or to deal with charcoal marketing*”. This finding is in agreement with Kazimoto (2015) who reported that charcoal producers earned as little as 20 percent of final retail price of charcoal paid by urban consumer as they were not organized and so they could not exercise any negotiating power for good price. Another respondent, respondent said;

We have the challenge of poor market structure for our charcoal both here in Makunka area and in Livingstone town. This is because people who can buy our charcoal in Makunka area are civil servants or government workers who happen to be teachers, health workers, Agriculture and veterinary workers and some business people. In both Livingstone and Makunka area, charcoal supply is so high that at times if you do not sale your charcoal on either credit or lower prices, it can take you maybe a week to sell a bag of charcoal. In

Livingstone you find that in markets, the place where charcoal is being sold from is on the outskirts of the market and the place is dirty. When you go round in the compounds following the customers, in some compounds you will be greeted by posters written ‘Quality charcoal is sold here’.

The findings are not consistent with Kazimoto (2015) who pointed out that charcoal has a large and ready market for producers to sell all their produce. This might be as a result of different organizational structures in the charcoal value chain in the respective study areas. Without a regulatory authority, the supply of charcoal cannot be controlled, which in turn affects the price and ultimately the livelihood of the participants.

5.6.2 Too Much Labor

All the respondents reported that charcoal production is labor intensive especially during felling, cross cutting the felled trees into sizable logs, carrying logs to the kiln sites and kiln making stages. This is a challenge in the sense that at times the charcoal producers have to lay back from work and take some days off, to rest in their homes so as to recover their energy to continue with the activity. This is why some times women hire men to do some work for them and fire usage also becomes necessary. This finding is similar to that of Kazimoto (2015) who indicated that there are laborious tasks in charcoal production.

5.6.3 Lack of Packaging materials for Charcoal

When the charcoal kiln cools down the charcoal has to be separated from soil and then packed into empty bags. The bags mostly used are those previously packed with cement. They are mostly sourced from Livingstone where there are a lot of constructions going on. The packing of charcoal into empty bags makes it easier to transport and sell. When asked how the lack of empty bags negatively affected charcoal business, one respondent narrated as follows:

Empty bags for packing charcoal are not readily available in Makunka area and so charcoal producers have to travel to Livingstone where they are sold at ZMW 1.50 or ZMW 2.00 per bag in construction sites. The money used to travel to Livingstone and the money for buying empty bags in turn raises or increases the cost of producing and supplying charcoal in Makunka area. At times the charcoal supplier demands for empty bags back from the customers but this does not solve the problem or challenge as customers argue that once a bag of charcoal is sold that is the end because people who buy bags of meal-meal do not

return bags to shops or mealie-meal suppliers and question why the charcoal buyer should return the empty bag after using the charcoal. Due to lack of empty bags charcoal can be in the bush unpacked for some weeks or months which affects the producers negatively as sometimes charcoal can be stolen when the owner is still sourcing or looking for empty bags.

These findings are in line with Gumbo *et al.*, (2013) who reported that lack of packing materials for charcoal was a challenge in charcoal production and marketing.

5.6.4 Health Problems

All the men and the women respondents reported that they were facing health problems due to the smoke that they inhale, exposure to heat and the labor involved during the process. The health problems include coughing, backaches and general body weakness. When the health problem becomes severe or serious, the affected person cannot produce charcoal due to body weakness. This is a challenge in that when the charcoal producer is still unwell, he or she may lose the customer and sometimes the kiln will be over burnt or the pyrolysis process may stop if there is no regular monitoring due to illness. The finding is in agreement with Neufeldt *et al.*, (2015) who reported that charcoal production poses a health threat as there is emission large amounts of carbon monoxide.

5.6.5 Lack of Government Support

The respondents were asked a question to state the type of support that they expected from the government. The respondents pointed out that they expected support from the government in terms of marketing support by finding reliable charcoal market or encourage the formation of charcoal producer's association that would look into the affairs or interests of both the government and charcoal producers and also improving the legalities of the charcoal business. The findings are in line with Gumbo *et al.*, (2013) who revealed that legal fees such as production and conveyance permits paid to the Forestry Department, levies paid to local authorities and payments made to the hired labor are high. The findings are also consistent with Zulu and Richardson (2012) who indicated that restrictions on legal charcoal production and trading in some African countries drives charcoal into the informal sector that exposes small scale producers to mistreatment like bribing corrupt police and Forestry officials thereby increasing transaction costs and reducing net incomes. Additionally, the finding is in line with Neufeldt *et al.*, (2015) who revealed that forest governance receives little attention and insufficient budget.

In light of this, it is important for the government to provide an enabling environment for charcoal production by providing incentives to the producers to comply with regulations. If the charcoal producers and marketer's association is put in place, it can enhance the charcoal value chain by bridging the gap between the government and charcoal producers in the interest of national development.

5.6.6 Depletion of Desired Tree Species

The non-availability of desired or suitable tree species in the nearby area in Makunka area forces the charcoal producers to start covering long distances to the areas where preferred tree species are found. This becomes a challenge in the sense that they were taking a lot of time to walk or ride to the production site from their homes. They sometimes camp in the bush for some days while others, mostly women, spend about two to three hours walking every day. This has negatively affected the production rate of the producers as they get tired even before reaching the charcoal production sites. This in turn causes another challenge of increased or high transport charges. The increased transport fares have been influenced by the increase in distance to charcoal production sites due to the disappearing of preferred tree species. However, this challenge has been caused by high level of tree extraction by men and women in their surrounding areas. This finding is in agreement with Olarinde and Olusola (2018) who pointed out that scarcity of trees for charcoal production resulted into a change in price as the further the distance from home to production sites, the higher the transportation charge.

5.6.7 Difficulties in acquiring licenses

The two key informants reported that men and women involved in charcoal production and marketing lack sufficient financial resources to buy permits for them to engage in charcoal production and marketing legally. There are two types of permits that are supposed to be bought in order to legally participate in charcoal production and marketing. The two types of permit are production permit and conveyance permit. The production permit allows an individual to produce charcoal according to the number of bags indicated on the permit. The conveyance permit allows someone to transport and sell charcoal. The two key informants noted that these permits were too expensive for the rural dwellers to buy. For instance, in the case of production permit for each 50kg bag previously used for cement is ZMW 20.00 while the retail price in Livingstone ZMW 35.00. This entails that if someone wants to produce 100 bags then s/he has to pay ZMW 2000 for

the production permit which compounds the total costs on top of transportation costs and labor hires for women. This amount is therefore too high for poor rural dwellers to pay especially women who do not have a lot of time to do piece work outside home to raise the amount for a permit. This is a challenge for men and women charcoal producers. As such they have resorted to selling their charcoal at the production site at lower prices compared to selling their charcoal in urban areas where it would fetch a higher price. The charcoal producers and trader's failure to acquire legal documents limits their ability to legally and freely sell their charcoal at a reasonable price.

5.6.8 Lack of reliable means of transport

In addition, the two key informants said that men and women engaged in charcoal production faced the challenge of having no reliable mode of transport to take their charcoal to town especially during the rainy season coupled with the bad geographical terrain in the area, as the roads become impassable due to mud and water logging. Thus, this affects their production and marketing rate. Lack of reliable transport and bad terrain in turn resulted in high transport charges for charcoal due to the high risk of having the vehicles used being damaged and the long distance covered from the production sites to the market. For instance, transportation fares are quite exorbitant due to the distance factor, as such they have to pay about K20.00 per bag.

5.7 Implications of Gender Roles in Charcoal Production and Marketing in Makunka Area of Kazungula District.

According to the study there are many implications of the roles performed by men and women in charcoal production and marketing on both, men and women.

5.7.1 Implications of Gender Roles in Charcoal Production and Marketing for Men

The results showed that 72 percent of the respondents reported that most men transport their charcoal first if charcoal for women (especially those whose husbands are not involved in transportation) is ready for transportation while 28 percent of the respondents reported that charcoal was transported whenever it was ready to be transported regardless of whether the charcoal was for a woman or for a man. When charcoal is ready to be transported to the market, men normally start transporting their charcoal before transporting the charcoal that belongs to the women. The reasons given for this state of affairs are that firstly unmarried men dominate in the role of transporting charcoal to customers or to the market and secondly, very few women have their own means of transport.

Three quarters (75%) of the respondents reported that men mostly did not sell their charcoal at the production sites while a quarter (25%) of the respondents reported that some men sell their charcoal at the production sites. The reason for this situation in the study area was that men are mostly market oriented in most of the things that they do and usually, their production is higher than that of women. Additionally, there is more profit in selling at the designated market than selling at the production site. The fact that men are mostly the ones transporting charcoal to urban areas, has exposed them to big buyers like wholesalers and business people running restaurants who can buy charcoal in bulk. According to the culture in Makunka area it is normal for a man to leave his home for a week or two to do business as he is regarded to be the provider for the family but for a woman to do so, leaving her nurturing roles of caring for the children and cooking for the family, is considered morally wrong. This therefore means that since men are exposed to a wider charcoal market away from the production sites in Makunka area, they generally make more money from the charcoal business than women. This is because in their marketing or pricing they have to increase the price as transportation costs are also included thereby making more profit.

Concerning the quality of charcoal produced, most of the respondents (63%) indicated that men produced and sold better quality charcoal than women whereas 37 percent of the respondents reported that there was no difference in terms of quality between the charcoal produced by the women and that of the men. The respondents gave some reasons as to why men produce charcoal which is of better quality than that of women. The first reason given was that men were mostly involved in the selection of the trees that could produce good quality charcoal. This role gave men an advantage in the selection of good trees in the forest or area in terms of size and maturity, which they later mark for security. In addition, men usually have the time to closely monitor the burning charcoal kiln so as to avoid logs or charcoal from being over burnt or fire from being put out completely thereby producing good quality charcoal. According to the culture in the study area men were free to go in the production sites and camp for some days meaning there is proper concentration on the burning of the kiln as opposed to women who just monitor the burning kiln for a short time. If the burning kiln lacks close monitoring, the logs may get over burnt or sometimes the burning process may completely stop. In the event of disappearing of preferable tree species in the nearby forest, men can still access preferable tree species by camping in the area where they are found as opposed to women who cannot camp in the forest according to the culture in the study area.

5.7.2 Implications of Gender Roles in Charcoal Production and Marketing for Women

Although women dominate in monitoring the kiln during the day, men dominate the role of monitoring the kiln at night thus those women without access to men's labor for this are negatively affected. This view was held by 80 percent of the respondents who reported that unmarried women risk their charcoal being over burnt as they could not monitor the kiln properly but the other 20 percent of the respondents reported that such women hire men to monitor their kilns at night. The reason given as to why they cannot do so, was that they could be exposing themselves to dangerous vices such as being attacked by rapists or people accusing them of being prostitutes as they can be doubting as to whether those women really go for kiln monitoring. The women were also afraid of creating a taboo in the area as it is against their culture in the area for women to be sleeping or camping in the bush. Sometimes the burning process of the kiln can stop due to lack of attention at night. When this happens, then this means that the burning process has to be started afresh which is a draw back or delay of the whole process. The over burnt charcoal does not fetch good income as it is light, does not burn properly and breaks easily thereby adversely affecting the unmarried women in their charcoal production and marketing (Plate 5.5).



Plate 5.5: Over burnt charcoal at one of the kilns in Makunka area.

Source: Field data, 2018

More than half (65%) of the respondents reported that women mostly sell their charcoal at the production sites while the other 35 percent of the respondents reported that women did not sell their charcoal at production sites. There were some reasons that induced this state of affairs, the first reason advanced as to why women were selling their charcoal at production sites was due to lack of quick transport as men who were mostly involved in the transportation of charcoal would at times tend to first transport their charcoal to the market leaving the women stranded with their charcoal. The second reason was that women have had other responsibilities to attend to at home like taking care of the children by cooking or preparing meals for them which seemed to be a challenge for most men, as a result some men would not allow their wives to be spending a lot of time selling charcoal at the market while other roles remain unattended to. The women lamented that they were making very little profit or gain from charcoal sells when their charcoal was sold at the production sites as they were forced to sell their charcoal at wholesale prices.

The majority (67%) of the respondents reported that one of the implications of gender roles in charcoal production and marketing for women was the high cost of production which is a consequence of some women hiring men or bigger boys to cross cut the felled trees into sizable logs which are suitable for making a kiln and carrying those logs to the site where the kiln would be made in order to do these roles. Additionally, during monitoring of the kiln, loading of the charcoal bags into the vehicle and transporting charcoal, some women had to pay or hire men to do these roles as men were mostly the ones performing them. Sometimes women pay the hired men in kind by surrendering some felled trees which they cut down using fire, for instance, after cutting down about five trees using fire, a woman may engage a man to cross cut four trees into sizable logs, and as payment the man will be given one tree for the labor rendered during the cross-cutting exercise.

The key informants acknowledged that gender roles have implications in production and marketing of charcoal. The two key informants revealed that the roles done by men and women especially in the cutting of the trees with fire and firing of the kiln phases have devastating effects on the environment which in turn affects the production and marketing of charcoal (Plate 5.6). It was pointed out that use of fire to cut down trees which is mostly associated with women, destroys the preferred tree species completely in the area and so in the near future only unsuitable tree species will be available for charcoal production which can further affect the charcoal business in a negative way. The key informants reported that poor sales of charcoal due to high supply of

charcoal on the market has been influenced by the roles done by men and women during the production stage which resulted in high charcoal production. This has an implication on the marketing of charcoal as the charcoal customers can start negotiating for a reduced price without considering the cost and labor that was involved in the production of charcoal, sourcing the packing bags and in the transportation of charcoal thereby leaving men and women involved in charcoal production and marketing in a disadvantaged position as they cannot sell their charcoal at more profitable prices.



Plate 5.6: Degraded Forest of preferred tree species due to charcoal production in Makunka

Source: Field Data, 2018.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter presents the conclusion of the study and gives recommendations following the findings for the relevant authorities to act upon. The study examined gender roles and their implications in charcoal production and marketing in Makunka area of Kazungula district of Southern Province in Zambia. The following are the conclusions drawn from the study.

6.2 Conclusions

With regards to the roles involved in the charcoal production process, the study found that there were some roles that were exclusively gender specific some in which one gender significantly dominated the other and some in which both men and women were found to participate. Men significantly dominated in the selection of good quality trees to cut and cross-cutting trees into sizable logs. The study found that carrying sizable logs to the kiln site and transportation of charcoal bags from the production sites to the markets or area of consumption (using bicycles, ox-carts and vehicles) was done by men alone. Women were mostly dominating in tree felling for charcoal production using fire (as they considered it to be faster than using axes). The study also found that firing the kiln, monitoring the kiln using hired labor and selling of charcoal was done by women alone. Some roles that were done by both men and women were, making of the kiln, packing of charcoal, sourcing of empty sacks, collection of covering material and tree felling where women used fire while men used axes.

The study concludes that during charcoal production and marketing, men and women recognize the following as opportunities; high charcoal demand as a result of increased urbanization; issuance of charcoal production and conveyance permits which encourage them to get legally involved thereby increasing their market reach; tree regeneration after being cut, though this takes some time to fully grow.

In charcoal production and marketing the following are the reported challenges; poor marketing structure of charcoal both in Makunka area and in Livingstone due to high uncontrolled production and supply; too much labor involved in the production of charcoal; lack of empty bags for packing charcoal in Makunka area and Livingstone as it would take someone one or two weeks looking for those empty bags; men and women were experiencing health problems during and after the production of charcoal due to the amount of labor involved and inhaling of the smoke; lack of

government support in terms of structuring marketing systems and recognizing the charcoal sector as a source of income, energy and employment; disappearing of preferred tree species (Mopane, Acacia and Burkea) in the area leading producers to travel long distances of about eight to ten kilometers from their homes to the production sites if they were to use suitable or preferred tree species which in turn brought about an increase in charcoal transport charges.

The study concludes that the associated implications of gender roles in charcoal production and marketing for women are; high costs of charcoal production because of the need to use hired labor at some nodes; use of unsuitable tree species due to depletion of desired species leaving a strain of them having to cover long distances to get to the desired trees; little or low income due to selling charcoal at the production sites; inferior charcoal quality as compared to men's due to lack of time to monitor the kiln during pyrolysis, which fetches low income. For men the implications are that, men make more income as they do not sell their charcoal at production sites; men produce good quality charcoal as they use preferred tree species; men's charcoal reaches the market earlier than women's and so they sell their charcoal faster before charcoal for women reaches the market.

6.3 Recommendations

This section of the study presents suggestions and recommendations drawn from the findings in the study. Some of these are highlighted here as a means of suggesting a way forward. The study put forward the following recommendations;

- (i) Forestry Department & Non-Governmental Organizations dealing in forest and environmental protection should sensitize men and women involved in charcoal production by engaging traditional leaders through village head persons on better practices, by presenting effective alternatives so as to retain soil nutrients or tree regeneration considerations. For example, reducing women's use of fire in tree felling by providing better and more effective practices.
- (ii) Men and women engaged in charcoal production and marketing should form an association that can help to handle the challenges faced by the charcoal producers and marketers in the area while considering gender roles and their implications. This will also help in providing feedback to the involved parties (Forestry Department or non-governmental organizations) thereby bridging the gap between these institutions and the men and women involved in charcoal production, making it easier for them to intervene.

6.4 Future research

1. Given the complexities in this field, as seen from the data in this research, a multi-disciplinary research framework is needed to further enhance the knowledge base on gender dimensions in the charcoal value chain.
2. Studies should be conducted on how charcoal production can be carried out while minimizing the effects of deforestation and forest degradation thereby making charcoal production and marketing a viable livelihood option for both men and women in rural areas.

REFERENCES

- Baumert, S., Luz, A.C., Fisher, J., Vollmer, F., Ryan, C.M., Patenaude, G., Zorrilla-Miras, P., Artur, L., Nhantumbo, I. and Macqueen, D., 2016. Charcoal supply chains from Mabalane to Maputo: Who benefits? *Energy for Sustainable Development*, 33, pp.129-138.
- Central Statistical Office: *Zambia Census of Population and Housing, 2000*. Lusaka, Zambia; 2010.
- Central Statistical Office: *Zambia Census of Population and Housing, 2010*. Lusaka, Zambia; 2010.
- Chidumayo, E.N. and Gumbo, D.J., 2013. The environmental impacts of charcoal production in tropical ecosystems of the world: A synthesis. *Energy for Sustainable Development*, 17(2), pp.86-94.
- Chidumayo, E.N., 2017. Biotic interactions, climate and disturbance underlie the distribution of two *Julbernardia* tree species in miombo woodlands of Africa. *Journal of Tropical Ecology*, 33(1), p.1.
- Chiteculo, V., Lojka, B., Surový, P., Verner, V., Panagiotidis, D. and Woitsch, J., 2018. Value chain of charcoal production and implications for forest degradation: Case study of Bié Province, Angola. *Environments*, 5(11), p.113.
- Clancy, J.S., Skutsch, M. and Batchelor, S., 2003. The Gender-Energy-Poverty Nexus: Finding the energy to address gender concerns in development. *DFID project CNTR998521*.
- Delahunty-Pike, A., 2012. Gender equity, charcoal and the value chain in Western Kenya.
- Dlamini, C., Moombe, B., Syampungani, S. and Samboko, P.C., 2016. Load shedding and charcoal use in Zambia: What are the implications on forest resources. *Policy Brief*, (85).
- FAO. 2010. Roles of women in agriculture. <http://www.fao.org/docrep/013/am307e/am307e00>.
- FAO. 2011. Gender differences in assets <http://www.fao.org/docrep/013/am317e/am317e00.pdf>
- Köhler-Rollefson, I., 2012. *Invisible guardians: women manage livestock diversity* (No. 174). Food and Agriculture Organization of the United Nations (FAO).
- Farré Lúdia. 2012. *The Role Of Men for Gender Equality*. Washington, DC: World Bank. © World Bank. <https://openknowledge.worldbank.org/handle/10986/9237> License: CC BY 3.0 IGO.
- Francis, B., 2000, July. Is gender a social construct or a biological imperative. In *7th Australian Institute of Family Study Conference-Sydney* (pp. 24-25).

- Geldenhuys, C.J., 2005. *Basic guidelines for silviculture and forest management practices in Mozambique*. Report Number FW-04/05, Forestwood cc, Pretoria.
- Government of the Republic of Zambia, 2008. *National energy policy*. Lusaka: Ministry of energy and water development.
- Government of the Republic of Zambia, 2018. *Zambia's report on the implementation of the United Nations General Assembly Resolution 71/175 on the girl child, early and forced marriages*. Lusaka: Ministry of Gender.
- Government of the Republic of Zambia. 2014. *National gender policy*. Lusaka: Ministry of gender and child development.
- Gumbo, D.J., Moombe, K.B., Kandulu, M.M., Kabwe, G., Ojanen, M., Ndhlovu, E. and Sunderland, T.C., 2013. *Dynamics of the charcoal and indigenous timber trade in Zambia: A scoping study in Eastern, Northern and Northwestern provinces* (Vol. 86). CIFOR.
- Hancock, B., Ockleford, E. and Windridge, K., 2001. *An introduction to qualitative research*. Trent focus group.
- Haverhals, M., Ingram, V., Elias, M., Basnett, B.S. and Petersen, S., 2016. Exploring gender and forest, tree and agroforestry value chains: Evidence and lessons from a systematic review.
- Herd, A.R.C., 2007. Exploring the socio-economic role of charcoal and the potential for sustainable production in the Chicale Regulado, Mozambique. *A dissertation presented for the degree of Master of Science, University of Edinburgh*.
- Hibajene, S.H and Kalumiana, O.S., 1996. *Manual for charcoal production in Zambia*. Lusaka: Ministry of energy and water development.
- Ihalainen, M., Mwale, M., Moombe, K. and Gumbo, D., 2018. Women producing charcoal in Zambia (Or the costs and benefits of challenging the patriarchy). *Forests News*.
- Ingram, V., Haverhals, M., Petersen, S., Elias, M., Basnett, B.S. and Phosiso, S., 2016. Gender and forest, tree and agroforestry value chains: Evidence from literature. In *Gender and forests* (pp. 251-272). Routledge.
- Profile, C.G., Zambia Final Report March 2016 Japan International Cooperation Agency (JICA) Japan Development Service Co. Ltd. (JDS).
- Jones, B., 2015. *Social and environmental impacts of charcoal production in Liberia* (Doctoral dissertation, University of Michigan).

- Kazimoto, J.U.M.A., 2015. *Charcoal value chain analysis in Uyui District and Tabora Municipality, Tanzania* (Doctoral dissertation, Sokoine University of Agriculture).
- Kammen, D.M. and Lew, D.J., 2005. Review of Technologies for the Production and Use of Charcoal. *Renewable and appropriate energy laboratory report*, 1.
- Kaplinsky, R. and Morris, M., 2000. *A handbook for value chain research* (Vol. 113). Brighton: University of Sussex, Institute of Development Studies.
- Kiptot, E., 2015. Gender roles, responsibilities, and spaces: implications for agroforestry research and development in Africa. *International Forestry Review*, 17(4), pp.11-21.
- Kiptot, E., Franzel, S. and Degrande, A., 2014. Gender, agroforestry and food security in Africa. *Current Opinion in Environmental Sustainability*, 6, pp.104-109.
- Köhlin, G., Sills, E.O., Pattanayak, S.K. and Wilfong, C., 2011. Energy, gender and development: what are the linkages? Where is the evidence? *Where is the Evidence*. Washington D.C. World Bank.
- Laven, A., Van Eerdewijk, A., Senders, A., van Wees, C. and Snelder, R., 2009. Gender in value chains: Emerging lessons and questions. *Agri-ProFocus working paper*.
- Lindsey, L.L., 2015. *Gender roles: A sociological perspective*. Routledge.
- Lurimuah, S., 2011. *The economic and environmental effects of commercial charcoal production in the Upper West Region of Ghana* (Doctoral dissertation).
- Lyons Andrew, Johnson Anthony, Mwila Godfrey, Muyaba Austin (2004). *Charting a course to Food security for southern province: mid- term evaluation of the care Livingstone Food security project*. Arlington. Associates in rural development.
- Malama, A., Makashini, L., Abanda, H., Ng'ombe, A. and Mudenda, P., 2015. A comparative analysis of energy usage and energy efficiency behavior in low-and high-income households: The case of Kitwe, Zambia. *Resources*, 4(4), pp.871-902.
- Malimbwi, R.E., Shemwetta, D.T.K., Zahabu, E., Kingazi, S.P., Katani, J.Z. and Silayo, D.A., 2005. Summary Report of Forest Inventory for the Eleven Districts of Eastern and Southern Tanzania. *Forestry and Beekeeping Division, Dar es Salaam, Tanzania*.
- Malonza, R. and Fedha, M., 2015. An assessment of gender and energy in Kenya: the underlying issues. *International Journal of Scientific and Technology Research*, 4(9), pp.137-153.
- Mihyo, P.B. and Mukuna, T.E. eds., 2015. *The gender-energy nexus in Eastern and Southern Africa*. OSSREA.

- Milimo, M.C., Munachonga, M., Mushota, L., Nyangu, N. and Ponga, A., 2004. *Zambia: strategic country gender assessment* (No. 33776, p. 1). The World Bank.
- Miller, C. and Razavi, S., 1995. *Gender mainstreaming: A study of efforts by the UNDP, the World Bank and the ILO to institutionalize gender issues* (No. 4). UNRISD Occasional Paper.
- Mugo, F. and Ong, C., 2006. Lessons from eastern Africa's unsustainable charcoal business. Nairobi: World Agroforestry Centre.
- Muzeya Lufunda (2015) *Energy policy in Zambia*. Lusaka: Ministry of mines energy and water Development.
- Mutua, E., Njuki, J. and Waithanji, E.M., 2014. Review of gender and value chain analysis, development and evaluation toolkits.
- Neufeldt, H., Langford, K., Fuller, J., Iiyama, M. and Dobie, P., 2015. From transition fuel to viable energy source: improving sustainability in the sub-Saharan charcoal sector. *World Agroforestry Centre, Nairobi, Kenya*. 55pp.
- Ngoo, G.A., Sway, M. E and Mwampamba, T.H (2011). *Challenges and Opportunities of addressing gender issues in the Sustainable charcoal sector in Tanzania*. Arusha: TATEDO and ENERGIA.
- Khamati-Njenga, B. and Clancy, J., 2005. Concepts and issues in gender and energy. *ENERGIA, Leusden*.
- Nyaruwata, L. T, and Chideya, T.N, (2014). *Gender issues in economic growth and poverty reduction*. Addis Ababa. Organisation for social science research in Eastern and Southern Africa.
- Olarinde, O. and AdeyinkaOlusola, J., 2018. Socio-economic impacts of charcoal production in Oke-Ogun area of Oyo State, Nigeria.
- Ongoro, E.B. and Ogara, W., 2012. Impact of climate change and gender roles in community adaptation: A case study of pastoralists in Samburu East District, Kenya.
- Ott, E., 2002. *Chaos in dynamical systems*. Cambridge university press.
- Phiri, C.M. and Chisonga, N., 2013. Baseline Survey Report for Kazungula and Namwala Districts of Southern Province in Zambia Oxfam Zambia, Climate Justice Initiative Project.
- Redding, V., 2011. *Strategy for equality between women and men*. Luxembourg: European Commission Justice, Fundamental Rights and Citizenship.

- Rubin, D. and Manfre, C., 2014. Promoting gender-equitable agricultural value chains: Issues, Opportunities, and Next Steps. *Gender in agriculture*, pp.287-313.
- Sawka, K.S., Mbewe, C., Josephat, D. and Ngulube, E., 2013. Linguistic Survey Report.
- Seboka, Y., 2009. Charcoal production: opportunities and barriers for improving efficiency and sustainability. *Bio-Carbon Opportunities in Eastern & Southern Africa*, p.102.
- Shankwaya, S., 2009. *Study to explore barriers to utilization of maternal delivery services in Kazungula district* (Doctoral dissertation, KIT (ROYAL TROPICAL INSTITUTE)).
- Smith, L.C., Ramakrishnan, U., Ndiaye, A., Haddad, L. and Martorell, R., 2003. The importance of Women's status for child nutrition in developing countries: international food policy research institute (IFPRI) research report abstract 131. *Food and Nutrition Bulletin*, 24(3), pp.287-288.
- Smith, H.E., Hudson, M.D. and Schreckenber, K., 2017. Livelihood diversification: The role of charcoal production in southern Malawi. *Energy for Sustainable Development*, 36, pp.22-36.
- Stromgaard, P., 1986. Biomass estimation equations reviewed--the example from the Zambian miombo. *Agroforestry systems*.
- Syampungani, S., 2008. *Vegetation change analysis and ecological recovery of the Copperbelt Miombo woodland of Zambia* (Doctoral dissertation, Stellenbosch: University of Stellenbosch).
- Tibesigwa, B., Visser, M. and Turpie, J., 2015. The impact of climate change on net revenue and food adequacy of subsistence farming households in South Africa. *Environment and Development Economics*, 20(3), pp.327-353.
- Tembo, S.T., Mulenga, B.P. and Sitko, N., 2015. *Cooking fuel choice in urban Zambia: implications on forest cover* (No. 1093-2016-87797).
- Tesot, A.K., 2014. Environmental Implications of the Charcoal Business in Narok-South Sub-County, Narok County. *Master's thesis, Kenyatta University, Nairobi, Kenya*.
- United Nations Development Programme, 2004. *Gender and energy for sustainable development: a tool kit and resource guide*. New York. Energy and environment group.
- WEC. 2004 survey of world energy resources.
<http://www.worldenergy.org/wecgeis/publications/reports/ser/biomass/biomass.asp2004>.
- Trinnaman, J. and Clarke, A. eds., 2004. *2004 Survey of energy resources*. Elsevier.

- Vos, J. and Vis, M., 2010. Making charcoal production in Sub Sahara Africa sustainable. *Report prepared for the Ministry of Economic Affairs, Agriculture and Innovation, Government of the Netherlands.*
- Wood, R.G. and Garside, B., 2014. Informality and market governance in wood and charcoal value chains. *IIED Briefing Paper-International Institute for Environment and Development*, (17274).
- Ziba, V and Grouwels, S. 2017. *Greening Zambia`s charcoal business for improved livelihoods and Forest management through strong producer groups*. Rome: Food and Agriculture Organization of the United Nations.
- Zimbab, H., District-Level institutions response to climate change scenarios for small-holder farmer`s adaptation: A case of the rainfall variability prone Kazungula District, Southern Province, Zambia.
- Zulu, L.C. and Richardson, R.B., 2013. Charcoal, livelihoods, and poverty reduction: Evidence from sub-Saharan Africa. *Energy for Sustainable Development*, 17(2), pp.127-137.

APPENDIX A: Interview Guide for Charcoal Producers and Marketers

I am **Kebby Siakachoma** a Master's Degree student at the University of Zambia under the Department of Geography and Environmental studies in the School of Natural Sciences. I am carrying out an academic research on Gender roles and their implications in charcoal production and marketing in Makunka area of Kazungula District. The data collected will be purely for academic purposes. Confidentiality will be strictly adhered to. You are requested to participate in this research by responding to the questions in this interview guide.

1. Age

Below 20 years [] 21- 30 years [] 31- 40 years [] 41- 50 years [] above 51 years []

2. Sex

Male [] Female [].

3. Marital status

Single [] Married [] Widow [] Widower [] Divorced []

4. Highest education level attained

Primary level [] Junior secondary level [] Senior secondary level [] Tertiary level []

5. Are there some roles done by men only during charcoal production and marketing?

Yes [] No []

6. If the answer to question 5 is 'Yes', mention them.

- (i)
- (ii)
- (iii)
- (iv)

7. Are there some roles done by women only during charcoal production and marketing?

Yes [] No []

8. If the answer to question 7 is 'Yes', mention them.

- (i)
- (ii)
- (iii)
- (iv)

9. Are there some roles done by both men and women during charcoal production and marketing?

Yes [] No []

10. If the answer to question 9 is 'Yes', please state them.

- (i)
- (ii)
- (iii)
- (iv)

11. What are the effects of gender roles on charcoal production and marketing?

12. Are there some organisations in the area that provide capacity building skills on charcoal production and marketing?

Yes [] No []

13. If the answer to question 12 is 'Yes' please name those organisations.

- (i).....
- (ii)
- (iii).....

14. Is charcoal production and marketing the main source of your livelihood?

Yes [] No []

15. If the answer is 'No' to question 14, what is the main source of your livelihood?

Farming [] piece works []

16. Do you have a license for charcoal production?

Yes [] No []

17. If the answer is "No" to question 16, why don't you have a license?

- (i)
- (ii)
- (iii)

18. Are there some challenges during charcoal production and marketing?

Yes [] No []

19. If the answer to question 18 is "Yes" please mention them.

- (i)

(ii)

(iii)

20. What are some of the opportunities for men and women to venture in charcoal production and marketing?

(i)

(ii)

(iii)

Thank you for sparing your time

APPENDIX B: Interview Guide for the Key Informants from Forestry Department

I am **Kebby Siakachoma** a Master's Degree student at the University of Zambia under the Department of Geography and Environmental studies in the School of Natural Sciences. I am carrying out an academic research on Gender roles and their implications on charcoal production and marketing in Makunka area of Kazungula District. The data collected will be purely for academic purposes. Confidentiality will be strictly adhered to. You are requested to participate in this research by responding to the questions in this interview guide.

1. Position of the officer.....
2. Do men and women produce and sell charcoal in this district?
3. Who (i) produce more charcoal? Men () Women () .
(ii) Mainly transport charcoal ? Men () Women () .
(iii) Mainly sell charcoal ? Men () Women ()
4. What roles do men and women perform in the production and marketing of charcoal?
5. What are the implications of gender roles on charcoal production and marketing ?
6. What challenges are faced by men and women involved in charcoal production and marketing?
7. Are men and women involved in charcoal production and marketing aware of the negative effects of this economic activity on the environment?

Thank you for sparing your time

APPENDIX C: Consent Sheet for the Participants

Dear Participant,

This serves to give you an understanding of the research procedures that will be followed.

Similar information in this form will be read to you alongside the questions with regard to each objective and its research instrument.

Further the implications for your participation are explained below, finally you are asked to sign this form to indicate that you have agreed to participate in this exercise.

Thank you in anticipation.

Description

This is an educational research: the researcher is a student at the University of Zambia (UNZA) pursuing a Master of Science Degree in Environment and Natural Resources Management.

Purpose

The researcher would like to establish gender roles and their implications on charcoal production and marketing in Makunka area of Kazungula District?

Consent

Participation in the exercise is voluntary. We will talk for between 30 minutes and one hour. You don't have to answer all the questions and you can take a break or stop the interview whenever you need to. You are free to decline to participate in this exercise.

Confidentiality

All the data collected in this study will be treated with utmost confidentiality. Participants are assured that they will remain anonymous and untraceable in this study. It is against this background that participants will only be identified through a number and not by name.

Rights of Participants

All participants are assured that they are free to ask for clarification at any point of the exercise and to inform the researcher if they feel uncomfortable about any procedure in the research.

Contact Persons in case of any thing

If you would like to know about what I will find out in the study, you can call or email me using the phone number and email below.

0976259421. Email: kebbysiakachoma77@gmail.com

Declaration of consent form

I have read and understood the information sheet. I agree to take part in the interview.

Participant`s Signature.....

Participants Number:.....

Thank You.