

**FACTORS INFLUENCING THE INVOLVEMENT OF WOMEN IN THE CONSERVATION
AND MANAGEMENT OF FORESTS IN CHEPALUNGU CONSTITUENCY,
BOMET COUNTY.**

BY

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DECLARATION

I hereby declare that this report is my original work and has not been presented for the award of any degree in any other University.

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DEDICATION

This report is dedicated to my wife Christine Moraa Ruto; my daughters Sandra Chebet Ruto and Stephanie Cherotich Ruto who have been a constant source of motivation and given me the encouragement at the course of my work;my parents Richard Mibei and Helena Mibei.

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TABLE OF CONTENT

CHAPTER ONE: INTRODUCTION

1.1 Background of the study.....	1
1.2 Statement of the problem.....	4
1.3 Purpose of the study.....	5
1.4 Objectives of the study.....	6
1.5 Research questions.....	6
1.6 Research Hypothesis.....	6
1.7 Significance of the study	7
1.8 Limitations of the study	7
1.9 Delimitations of the study	7
1.10 Basic assumptions of the study.....	8
1.11 Definition of significant terms used in the study.....	8
1.12 Organization of the study	9

1.13 CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction	10
2.2 Concept of involvement of women in the conservation and the management of forests.....	10
2.2.1 Influence of culture in forest conservation and management.....	13
2.2.2 Influence of legislation in forest conservation and management.....	16
2.2.3 Influence of technology in forest conservation and management.....	20
2.2.4 Influence of religion in forest conservation and management.....	25
2.3 Theoretical framework	29
2.5 Operationalization of variables.....	31
2.6 Summary of literature review.....	33

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction.....	35
3.2 Research design.....	35
3.3 Target population.....	35

3.4 Sample size Sampling procedure.....	36
3.4.1 Sampling size.....	36
3.4.2 Sampling procedure.....	36
3.5. Research instruments.....	36
3.5.1 Piloting the study.....	37
3.5.2 Validity of research instruments.....	37
3.5.3 Reliability of research instruments.....	37
3.6 Data collection procedure.....	38
3.7 Data analysis techniques.....	38
3.8 Ethical considerations.....	38

CHAPTER FOUR: DATA ANALYSIS, INTERPRETATION, PRESENTATION AND DISCUSSION

4.1 Introduction.....	40
4.2 Questionnaire return rate.....	40
4.3 Demographic characteristics of respondents.....	40
4.3.1 Characteristics of respondents by age.....	40
4.3.2 Marital status of respondents.....	42
4.3.3 Characteristics of respondents by gender.....	43
4.3.4 Characteristics of respondents by levels of education.....	44
4.3.5 Characteristics of respondents by religion.....	45
4.4 Influence of culture in forest conservation and management.....	46
4.5 Influence of religion in forest conservation and management.....	48
4.6 Influence of technology in forest conservation and management.....	50
4.7 Influence of legislation in forest conservation and management.....	52

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSION, RECOMMENDATIONS AND SUGGESTIONS FOR FURTHER STUDY.

5.1 Introduction.....55

5.2 Summary of study findings.....55

5.3 Influence of culture in forest conservation and management.....56

5.4 Influence of religion in forest conservation and management.....56

5.5 Influence of technology in forest conservation and management.....57

5.6 Influence of legislation in forest conservation and management.....58

5.7 Conclusions of the study.....59

5.8 Recommendations of the study.....61

5.9 Recommendations for policy issues.....62

6.0 Suggestions for further study.....63

REFERENCES.....64

APPENDICES

Appendix I: Letter of Transmittal.....67

Appendix II: Questionnaire.....68

LIST OF FIGURES

Conceptual Framework.....	30
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LIST OF TABLES

2.2 Operationalization of variables.....	31
2.3 Independent variables.....	32
4.1 Characteristics of respondents by age.....	41
4.2 Characteristics of respondents by marital status.....	42
4.3 Characteristics of respondents by gender.....	43
4.4 Characteristics of respondents by levels of education.....	44
4.5 Characteristics of respondents by religion.....	45
4.6 Responses on influence of culture on women involvement in forest conservation and management.....	46
4.7 Observed and expected responses on relationship between culture and women involvement in forest conservation and management.....	47
4.8 Chi-square testing for the first hypothesis.....	47
4.9 Responses on influence of religion on women involvement in forest conservation and management.....	48
4.10 Observed and expected responses on relationship between religion and women involvement in forest conservation and management.....	49
4.11 Chi-square testing for the second hypothesis.....	49
4.12 Responses on influence of technology on women involvement in forest conservation and management.....	50
4.13 Observed and expected responses on relationship between technology and women involvement in forest conservation and management.....	51
4.14 Chi-square testing for the third hypothesis.....	52
4.15 Responses on influence of legislation on women involvement in forest conservation and management.....	52
4.16. Observed and expected responses on relationship between legislation and women involvement in forest conservation and management.....	53
4.17 Chi-square testing for the fourth hypothesis.....	54

LIST OF ABBREVIATIONS AND ACRONYMS

GHGs.....	Green House Gases
CF.....	Community Forest
FAO.....	Food Agricultural Organization
PFM.....	Participatory Forest Management
CFUGs.....	Community Forest User Groups
FUGs.....	Forest User Groups
NFAP.....	National Forest Action Plan
KFS.....	Kenya Forest Service
CFAs.....	Community Forest Associations
DFOs.....	Divisional Forest Officers
GFMC.....	Gambian Forest Management Concept
DFID.....	Department for International Development
FORMIS.....	Management Information System for the Forestry Sector
MFP.....	Minor Forest Produce
ZAWA.....	Zambia Wildlife Authority
EPPC.....	Environmental Protection and Pollution Control
CLASlite.....	Carnegie Landsat Analysis System-lite
ECZ.....	Environmental Council of Zambia
WTS.....	Wood Tracking System
NEMA.....	National Environment Management Authority

MDGs.....	Millennium Development Goals
EMCA.....	Environmental Management and Coordination Act
FMIS.....	Forest Management Information Systems
CBD.....	Convention on Biodiversity
NAP.....	National Action Plan
ICT.....	Information Communication Technology
ATR.....	African Traditional Religion
NCS.....	National Conservation Strategy
MoEF.....	Ministry of Environment and Forestry
MAFF.....	Ministry of Agriculture, Food and Fisheries
PCC.....	Public Complaints Committee
ASIP.....	Agriculture Sector Support Programme
FDA.....	Forest Development Authority
EPPC.....	Environmental Protection and Pollution Control
PRS.....	Poverty Reduction Strategy

ABSTRACT

The introduction of Participatory Forestry Management in Kenya has led to for community-based organizations that have come to be referred as Community Forest Associations. These organizations are responsible for diverse management activities in forest protection, management and monitoring. However, accesses to revenues and decision-making have been vested in the Kenya Forest Service. Most CFAs function autonomously including the crafting of resource harvesting rules, choice of leadership and conflict resolution. Gender roles in Kenya put women in direct contact with natural resources such as forests, water, land and wildlife. However, women are neglected when it comes to decision making. Forest is the most important resource after water in the world. Water and forests are the major components of diversity that represent the foundations of the ecosystem. The purpose of this study was to investigate the factors that influence the participation of women in forest conservation and management in forests in Chepalungu constituency of Bomet County. The study attempted to meet the following objectives: to examine the extent to which culture influences the involvement of women in the management and conservation of forests; to assess the extent to which legislation hinders women from participating in forest conservation and management; to examine the role played by technology in forest conservation and management and to assess the relationship between religion and forest conservation and management. The study used descriptive design and the target population was women, DFOs, FECs and CFUGs. Stratified sampling was used. Questionnaire was used to collect the data. Permission was obtained from the relevant authorities before the study.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Forests are considered the second most important resource after water throughout the world and the participation in its management is very important. Decentralized forest management regime has gained currency in developing countries in the recent years (Agrawal, Chhatre and Hardin 2008), being viewed as a means of enhancing economic efficiency, public accountability, community and individual empowerment and allocate efficiency in the forest sub-sector and ecosystems (World Bank, 2009). These are the key components that represent the foundation of ecosystems. Forests provide services which include water, timber, food and regulation of climate, floods, diseases, waste and water quality. About one quarter of the world's population directly or indirectly depend on forests for their livelihood (World Bank/DFID 2006). In the pursuit of development and income generation, trees have been cut for the sale of timber thus leading to deforestation which contributes to global warming and climate change. It is considered as the cause of 20% of the total Green House Gas emission (Adhikary and Ghimire 2003).

There have been efforts made by governments to conserve and manage forests. Many developing countries continue to face the challenge on how best to manage and conserve forests. Historically, conservation strategies have been dominated by attempts to fence off forest areas and exclude people from these reserved areas (Adams and Hulme 2001).

Community forestry is a term that describes models of forest management that give the local people a majority say in making decisions. Similar terms include participatory forest management (PFM), collaborative forest management (CBFM) and Joint Forest Management (JFM). Community forestry is a policy meant to benefit the poor by bringing about social changes and establishing efficient institutions. (FAO 1998). Women do not fare well under forestry management programmes (Tinker 1994, Locke 1999, Agrawal 2001) or even under devolution programmes. An improved policy to address gender inequity has not necessarily resulted in gains for women, though a large number of growing literature shows their knowledge of dependence on forest products (Shanley and Gaia 2001, Howard 2003, Colfer 2005).

In India, there are a few cases of women participation in Joint Forest Management (JFM) in all women committees in Indian hill areas (Agrawal 1997). Here, there are women forest protection committees involved in the protection of the village forests. (Ballabh et al 2002) They patrol the forest in groups of six every month to check for damage incurred and the extent

of the encroachment. They take appropriate actions such as reporting to the estate authorities if there are major cases of deforestation.

Women are disadvantaged and insecure in access to property rights, forest and tree resources (Place 1995 et al 1997). There is also discrimination and male bias in the provision of services including credit and technology (Doss 2001 German et al 2008). They are also excluded at decision making at household, community and the national levels (Agrawal 2001). They severely bear the cost of trees and forest management and realize only a portion of benefits. They are enlisted to decision making when forest and tree resources are degraded or after conflict (Agrawal and Chhatre 2006). In some parts of Asia, only one household member can be represented in the forest groups and most of these have been male heads or in some cases women are members by the virtue of their husband's membership (Agrawal 2001).

In Brazil, the federal government created eighty nine sustainable development reserves in Amazonia region encompassing twenty million hectares of forest. However, the rural women's relative role in forest policy and management is currently marginal. In order to ameliorate this dire situation, the Secretariat of Women Activists helped to transform the women's role and political hierarchy from the largely invisible to one of significance that the government took notice of and could not be ignored any more. In Nepal, community forest management has been acknowledged as a useful mechanism for protection of natural resources and as a tool for local development. Community Forest User Groups (CFUGs) have been formed for management and conservation of forests. The 1990 Master Plan has recommended that women should be at least one-half of the user committee members in the Community Forest Development Programme (CFDP 2001).

In North East Cambodia, there have been achievements in the implementation of Gender Action Plan of Prakas II Project. Sixteen field training courses on gender and natural resources were conducted in four target provinces. 167 out of 393 participants were women (RECOFT 2012). The ability of women to part in such flora will boost their skills and make better managers when they given a chance in forest activities and management. In Gambia, the government adopted the community forest concept developed by the FAO and introduced the Gambian Forest Management Concept (GFMC) through the Gambian Forest Act (1995). In addition, it also established the National Forest Fund and the National Forest Action Plan (NFAP) the latest being 2001-2010 period. The principal aim of these policy instruments was to promote development and environmental conservation through participatory or community –based

management and exploitation of the forest and its resources. It is on the basis of enabling policy environment that the Gambian government instituted the CBFMP in 2001 (FAO 2005).

In Kenya, poor management of forests is manifested by the loss of forest through unwarranted excision of forests for settlement of population. In the period between 1994 and 1995, close to 55,000 hectares of forest were cleared to pave way for state-sanctioned settlement of people often satisfy political interests of the ruling and politically mighty and connected (Njuguna, Mbegera and Mbithi 1999). The inadequate management of forest resources has contributed to a substantial loss to the country. An example is Kakamega forest that has been shrinking so fast because of human activity (Fashing et al 2004). In Thailand, the important role women play in local forest management illuminates the value of equal gender participation and representation and offers crucial lessons that may be of importance on how best resources can be shared with resource-dependent communities. Although the women were involved in forest management before Thailand's economic boom, the outmigration of men to work in booming economic sectors had a pivotal impact on the community. The women of the community took the crucial role of welcoming the visitors and lead tours of the community forest. Ensuring the protection and maintenance of natural resources allows these women and their families to meet their livelihoods on daily basis while supporting the vitality of the land, water, forest and the community.

In Kenya, the new Forest Management Act (2005) encourages local communities to participate in the management of forests adjacent to them. New institutions are emerging to implement the process of involving local communities in the management of forests with the local and central government institutions such as Kenya Forestry Service (KFS) and the county governments who are increasingly becoming robust since the start of operations by them. Communities are expected to form and register Community Forests Associations (CFAs) within different forests distributed across the country (MENR 2007). Such associations will have to be vetted following some laid out tight criteria before they can be allowed to operate. This will include the composition of its members, the objectives, and election procedures of their officials and the purpose for which it was established, the source of their funding and accountability measures. However, these communities may face serious challenges and later on collapse which may have a negative impact on the forest resources to which they are adjacent (Thurow 1995).

Chepalungu constituency has two major forests namely Chepalungu Forest and Kibirir Forest. The latter covers an area of around 150 km² and is densely covered. It has a lot of hardwood

such as Oak, Podo and Cedar trees. However; they are under a lot of threat from illegal loggers and charcoal burners who have a ready and expanding market of charcoal in the nearby towns such as Bomet and Siongiroi. The former has been largely destroyed and nothing much remaining of it. The government in the recent past has made a concerted effort towards reforestation which has been largely successful because of the involvement of the local community who were given forest land to till as they plant exotic trees seedlings that were supplied by the government. The major challenge that has been faced by forests leading to their near depletion is the failure to involve women in the management and conservation of these forests. Women have greater and intimate contacts with forests because they are the major firewood harvesters which are used in cooking and a times a source of lighting in households that are not connected to electricity and cannot afford kerosene. The conservation efforts and management has been left to the Keya Forestry Services guards who are dominated by men. Women have been alienated in all these and this might be the cause of heavy deforestation that has been witnessed in these forests.

1.2 Statement of the problem

According to Chariot (2014), the forestry management that involves women is thought to be beneficial. He recommended further investigations to be done on factors that influence the participation of women in forest management and conservation. Women have become empowered in forestry decision-making in a large part through the actions of community-based organizations and civil society. The efforts have been coordinated through under the umbrella of Kenya Forestry Working Group (KFWG) which brings together all parties concerned with forests conservation and management.

Despite these efforts, community forest has not addressed the challenges by women as they try to take part in the management and the conservation efforts of forests. The indigenous people only benefit from the forest products such as honey, firewood, timber (Dutta 2007). Since women lack formal education and personal network, they are poorly placed to influence the resource allocation (Crewe and Harrison 1998). Therefore the need to understand this continued lack of involvement is of priority since women continue to be the poorest in the developing world and their reliance of forests as a source of income and other products such as firewood ,herbs for traditional medicine, honey, fruits and berries that may help supplement their diet in some occasions .Currently, forests in Kenya are under a lot of threat and since women are the ones

who are in constant touch with the environment, they will lose out a lot. Therefore the inclusion of women in the management and the conservation of forests is of paramount importance.

The need for equality is still urgent today and is reflected in the fact that the most recent World Bank report focus on gender (World Bank 2011). This analysis is extremely important mainly in Kenya where gender divisions still exist and where the natural resources are essential in daily lives of the people. Agrawal (2009) is one of the few studies that analyze how the gender composition of community based projects affect forest conservation and management rules. The results show that groups with a higher participation of women in the Executive Committees (ECs) show improvements in forest conditions and generally the conservation efforts.

Recent research has also focused on explaining why gender matters in environmental action and what type of difference women can make in the management of forests (Agrawal 2000). Unless and until women can play a significant role in the decision-making process in all stages of forestry conservation and management, it cannot be counted as an increment of women's meaningful participation in an authentic way (Kanel 2006). However at an individual, household and at societal level, women's status is still low in Kenya. They are just participating physically at community forest activities but lack influential decision making role.

In the case of the forests in Chepalungu constituency, the Community Forestry Management has not succeeded and this points out where the problem exists. Despite having the CFAs in place, the forest is facing a lot of threats from human related activities such as illegal logging, charcoal burning and in some occasion serious soil erosion. CFAs rely only on membership fee and subscription by members as their main sources of funds (Kinyanjui, 2007). In addition, women have not benefitted from the management of forests yet they understand most the value of forest conservation. This research attempts to fill the gaps by investigating the actual reasons that influence the failure of women to take part in forest management and conservation in community forest in Chepalungu constituency of Bomet County.

1.3 Purpose of the study

The purpose of this study is to investigate the specific factors that influence the involvement in the conservation and management of forests by women in Chepalungu constituency of Bomet County.

1.4 Objectives of the study.

The study was guided by the following objectives:

- i) To examine the extent to which culture influences the involvement of women in the management and conservation of forests.
- ii) To assess the extent to which legislation hinders women from participating in forest conservation and management.
- iii) To examine the role played by technology in forest conservation and management.
- iv) To assess the relationship between religion and forest conservation and management.

1.5 Research questions.

The study was guided by the following research questions:

- i) To what extent does culture influence women involvement in forest conservation and management?
- ii) To what extent does legislation hinder women from participating in forest conservation and management?
- iii) To what extent does technology influence women involvement in forest conservation and management?
- iv) To what extent does religion influence women involvement forest conservation and management?

1.6 Research Hypothesis

The study tested the hypothesis to find out if there was any relationship between culture, legislation technology and religion and forest conservation and management in Chepalungu constituency, Bomet County. The hypothesis was tested and the results of the relationship were as follows:

- i) H1: There is a significant relationship between culture and women involvement in forest conservation and management in Chepalungu constituency, Bomet County.
- ii) H1: There is a significant relationship between legislation and women involvement in forest conservation and management in Chepalungu constituency, Bomet County.
- iii) H1: There is a significant relationship between technology and women involvement in forest conservation and management in Chepalungu constituency, Bomet County.
- iv) H1: There is a significant relationship between religion and women involvement in forest conservation and management in Chepalungu constituency, Bomet County.

1.7 Significance of the study.

This study may help in the providing useful information to the KFS for decision making on which women is a relevant target group to use in forest conservation and management. The findings of this research will also help the central government in the formulation of policies that favour women in the recruitment of forest guards. The current state of employing more males than females as forest guards will become untenable in the long run if forests are to be conserved and properly managed. The findings of this study may also help the NGOs and other community-based organizations to formulate programmes and policies to address issues and problems associated with forest conservation and management by women. The findings of this study may also help international bodies such as the UNEP that play a great role in the conservation of the environment and to emphasize the need of women to be part of forest conservation efforts.

1.8 Limitations of the study.

A number of challenges were faced at the course of this study. The major one was the language barrier because of high illiteracy levels among women who will be the key respondents. This was mollified by the use of interpreters and the researcher may learn the basic words of the language spoken by the respondents. The other challenge was time constraint. The research was projected to take duration of three months but it took more than three months due to unforeseeable reasons. This was remedied by sticking strictly to the time lines and where there was a delay a makeup event was arranged to ensure the study remained on track.

The other challenge was finances .As much as the study was budgeted to cost some considerable amount of money in transport, research, typing and printing, the budget was exceeded. This was bridged by overestimation of the budget and in extreme cases; emergency source of funding such as soft loans was obtained from friends and family. The other challenge was the lack of forest officers to give honest responses to the questionnaires since they may be culpable in forest destruction and other unethical activities. This was ameliorated by assuring them of the confidentiality of the sensitive information that they revealed.

1.9 Delimitation of the study.

This study was carried out in Chepalungu constituency of Bomet County which has only two forests. This study lasted for duration of four months from September; 2015.The study was

conducted among the people who live adjacent to the forests in Chepalungu constituency of Bomet County. The majority of the respondents were not only women who live adjacent to the forest but also the personnel charged with guarding over the forests. These are the Kenya Forestry Services guards.

1.10 Basic assumptions of the study

The research was based on the assumption that there was a clear gender policy which advocates for the programmes that take into consideration the environment and forest conservation by women in Chepalungu constituency forests. It was also assumed that other factors may have hindered women in the participation in management and conservation efforts in Chepalungu constituency. These are the factors that the study dug deep into with the aim of understanding how and why they bar women from being active participants in forest management and conservation.

1.11 Definition of significant terms used in the study.

Conservation- it is the process of putting efforts to prevent the destruction of forests.

Forest Management- concerned with the overall administrative, economic and legal protection of forests.

Community Forest- a forested area that the local community plays a pivotal role in the forest management and land use decision in order to benefit from the forest.

Involvement- participation of people or community responsible for carrying out forest development activities.

Forest conservation- refers to a range of activities, tools and approaches to achieve forest health and biodiversity objectives.

Forest protection- refers to the creation of parks and other areas to legally protect them from industrial activity and to help preserve healthy ecosystems.

Independent variable- is a variable that is changed or controlled in an experiment

Moderating variable- is a variable that affects the strength of relationship between dependent and independent variables.

Intervening variable- is an hypothetical internal state used to explain relationships between variables

Dependent variable- is a variable that depends on one or more other variables

1.12 Organization of the study.

This report is organized into five chapters. Chapter one gives the background of the study, statement of the problem, purpose of the study, objectives of the study, research questions, research hypothesis, significance of the study, limitations of the study, delimitation of the study, basic assumptions of the study and definition of key terms used in the study. Chapter two reviews the literature related to the study from the global perspective up to local level of the area of study. Chapter three describes the research methodology that was used in the study including research design, target population, sampling procedures, data collection procedures, data analysis techniques and ethical considerations. Chapter four deals with data analysis, interpretation, presentation and discussion. Chapter five deal with summary of findings, conclusion, recommendations and suggestions for further study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literature relevant to the study. It examines the concept of involvement of women in community forestry management and conservation, the influence on culture in conservation and forest management, the influence of technology in forest conservation and management, the influence of legislation in forest conservation and management and the influence of religion in forest conservation and management. It also examines the Theoretical framework, conceptual framework, operationalization of variables and the summary of literature review.

2.2 Concept of involvement of women in forest conservation and management

Sustainable forest management is intended to draw attention to social, economic, and ecological dimensions. A lot of attention has been placed on collective action at the community level as a successful mechanism for the protection of natural resources (Baland, Bardhan, Das and Mookhrjee 2010). Participatory Forest Management (PFM) is being adopted widely in most countries as an alternative method of managing of forest resources (Willy 2002). It is a multi-stakeholder approach where the private sector and communities are involved in the management of forests and sharing benefits. Community Forest Management (CFM) is the most common form of implementing PFM in most developing nations.

Research demonstrates that while women bring distinctive interests and values to forest management issues, their nominal and effective participation is restricted by a gender order that marginalizes their interests and potential contributions. The broadening of interests in forests has been characterized by increased pressures from diverse interest groups to be involved in sustainable management of public resources. This focus does not presuppose that women are the only or the most important consideration for sustainable forest management. The gap between interests and outcomes may arise because the forestry sector is subject to a “gender order” that privileges men’s contributions to forestry, constraints women’s participation in forestry management and ultimately reduces the capacity of the forestry sector to achieve inclusive forestry management as a key component of social sustainability.

Many countries have made an effort to decentralize natural resource management in an attempt to increase the equity in decision making and benefit sharing. Decentralization takes the form of

delegation, devolution and privatization (Meinsen-Dick and Knox 2001). In recent years, decentralization has found a solid footing as a government strategy to shift power to those affected by the exercise of power (Agarwal and Ostrom 2001).

In some countries such as Canada, women do not use forest resources for subsistence purposes but they still hold interests and perspectives in forest management that are distinctive from men's and hence, their active involvement in giving advice about how forests should be managed could influence decisions about sustainability. Furthermore, forestry communities are experiencing rapid economic, social and ecological changes that affect women. At the community level, for example, climate change may have significant effects including reduced health status of residents during extreme events, altered pay and unpaid work patterns within communities, changes in livelihood and household relations and long term health concerns for indigenous residents who have traditionally relied on country foods of the boreal forest. Because there remain marked differences in the roles, activities and expectations of men and women living in forestry-based communities, women and men will have different capacities to adapt to changing conditions. However, it is the women who are hit hard by the adverse changes happening in the environment (Bhattarai 2006). Research has long documented that women express greater concern about the environment than men and express greater support for the protection of forest ecosystems and the general environment. They also typically express greater risk aversion to and concern for climate change which is an environmental concern that will be significant for those living in boreal forests of Canada.

In Sweden, researchers have observed that women perceive social impacts of forest management differently than men while women employed in the USDA Forest Service are more likely than men to hold positive expectations and higher levels of trustworthiness regarding environmentalists, range users, citizen activists, and tribal representatives. With respect to the environment, women have been found working in grassroots organizations engaging more in environmentally friendly behaviors that can be integrated into their everyday life and working actively with forest certification programs. With respect to forestry, typically women are neither leaders of national forestry companies nor those of international environmental organizations and they do not participate as actively in other decision-making positions to advance their interests. Gender order refers to the dichotomous order of gender whereby maleness and femaleness are perceived as opposites and attributed different forms of behavior, different roles, and different places. A gender order is not a natural order but one that is created and recreated in

everyday work interactions through organizational cultures that establish the normative rules, values, and meanings in the workplace. In North America and Scandinavia, forestry occupations have created and elevated the importance of a working man's culture or community. This bias has been generated by the mystique of logging that created an image of forestry as hard, outdoor, physical labor that is dirty, dangerous, and ultimately masculine.

Despite an increase in the range of forestry occupations in the late 20th century that includes planning, regulation, as well as the introduction of labour saving devices, the idea of forestry as men's work still prevails. In forestry communities, this image is married to a traditional division of labour where men have rightfully enjoyed forestry jobs and high incomes and have served their families as primary breadwinners while women have stayed at home to raise children or have only worked for little money in forestry households (Agarwal 2001).

Nominal participation refers to the simple demographic representation of particular groups in society. Representatives are assumed to share the values, attitudes, and socioeconomic characteristics of those they represent and in a sense they are mirrors of the larger population. Wellstead and Pitken (1998) refer to this form of representation as descriptive or mirror representation. Participants may be seen as standing for a larger group. Applying this to forest management, if women are present in advisory committees, they are assumed to represent women's interests. This is a fairly limited and often inaccurate portrayal of how people actually operate. Nominal participation would assume that only women will bring forward concerns related to their gender and/or those women may restrict their contributions to such concerns. Despite their small numbers women come to decision making forums with knowledge and perspectives that are not necessarily relevant to forest issues.

Effective participation requires that participants are active and engaged in forest management. An assessment of effective participation would consider the rules of decision making such as whether a process is viewed as accessible, transparent, fair and consistent with existing laws, regulations or policies. It might also consider the attributes of individuals such as their knowledge of particular issues, their ability to mobilize resources and their comfort in speaking out on particular issues. Thus, effective participation involves assessing the ability of members to enhance the equity and efficiency of decisions and to advance their goals. Effective participation also gives consideration to how power operates within SFM processes and the influence of power on the capacity of individuals and groups to advance their interests. Biases can be subtle, almost invisible, and yet, they can influence effective participation. They can emerge in

procedures that determine selection criteria and processes identify sources and relevance of data, value alternative experiences and knowledge, set the location and timing of meetings and payments for attendance and provide level and type of agency support from government for the process.

Nominal participation is linked to effective participation, particularly where participating groups are minorities. That is, the number of people from particular social groups will influence the rules of entry and rules of practice (both formal and informal) and thereby alter the conditions for effective participation. For instance, Dahlerup observed that among Scandinavian women politicians, once women became a significant majority (passing a threshold of some 30% seats in Parliament or local councils), there was less stereotyping and open exclusionary practices by men, a less aggressive tone in discussions, a greater accommodation of family obligations in setting meeting times and a greater weight given to women's concerns in policy formulation. The necessity of critical mass within forest advisory committees has also been documented more recently by Richardson (2012).

2.2.1 Influence of culture in forest conservation and management

In **China**, women play a central role in providing the families' nutrition, health and income needs through indigenous agriculture, collecting water and firewood, gathering medicine plants in the forest and natural medicine products from natural resources, as well as converting natural resources to products for sale in local markets. They are familiar with the local natural environment and environmental change and know the uses of various plants and trees. Indigenous women are the major spreaders of traditional forest conservation knowledge. They have knowledge of use and conservation of forest resources and fragile ecosystem which is crucial to formulate policies of environmental and resources management. Indigenous women and men play different roles in forestry and family life due to the entrenched notion of "breadwinning men and homemaking women". Indigenous women and men undertake the productive activities but women not only participate in agricultural and forest activities but also carry the burden all housework. Women pay more attention to family productive work every day such as fetching water, cooking, cleaning bows and clothes, carrying pine leaves, feeding animals, collecting dry firewood, looking after the elderly and children. They concentrate on the process of forest growth which is close to family life such as collecting branches for firewood and feeding leaves to animals. They use mushrooms, bamboo shoots, wild herbs and

fruits to enrich variety of food for families. They prefer to plant economic fruits trees near the homes because fruits would bring income. They like planting firewood forest near home because it will shorten distance covered to pick up firewood. Housewives are in charge of sale of subsidiary agricultural products and consumer expenditure of daily life. Indigenous women are hampered by low level of education from taking part in environmental management and conservation. Due to lack of information and training chances, their indigenous knowledge and skills depend on oral practice that is conveyed by men in most occasions. Most young indigenous women are not interested to learn traditional forest knowledge.

In **Liberia**, women constitute the majority of small-holder producers and the agricultural labor force in general. One study found that women produce some 60% of agricultural products, carry out 80% of trading activities in rural areas and play a vital role in linking rural and urban markets through their informal networks. Despite their deep involvement in agriculture, women have less access to productive inputs, including land, than do men. Throughout Liberia's history, unequal access to and ownership of land and other resources have contributed significantly to economic and political inequality between men and women. In spite of these acknowledgements of traditional gender inequity, Liberia's forest policy, laws and regulations lack a gender analysis. While there are provisions that note the special situation of women and the need for their involvement in forest governance and management, policies do not treat the participation of women as a right. For example, in the forest policy regulations, an attempt was made to highlight the involvement and participation of marginalized groups such as women and youth in public meetings concerning forest management.

Burkina Faso has varying levels of inequality between men and women. Some of these inequalities are based on local customs and beliefs that have contributed towards limiting women's decision making power thus affecting their access to and control of natural resources. Burkinabe customary law authorizes women to use but not to own land thus severely limiting their exploitation of this vital resource leading to more exposure to poverty and nefarious effects of climate change on nature and daily survival. However, the Burkinabe government has taken a number of measures aimed at improving the status of women such as the creation of a ministry in 1997 to promote Women's Affairs. In addition, the law on rural land tenure, the National Policy on the Security of Land Tenure in Rural Areas and the Forest Code equally advocate for the easing of women's access to land. Though the laws and policies try to address injustices faced by women, other societal and cultural factors such as customary law render these laws ineffective.

The National Action Plan (NAP) on Adapting to Variability and Climate Change recognizes the fact that in addition to natural inequalities between men and women, the scarcity of land resources as a result of climate change further accentuates the vulnerability of women.

Women make up 51% of the population in **Cameroon**, make up 56% of the rural labour force, constitute 70-80% of the rural population and produce 60% of agricultural products. However; their benefit from agriculture is less than 20% of what they produce. Forests constitute 45% of the total surface area of Cameroon and provide approximately 6% of the GDP. These facts indicate that a significant portion of the female population depends on land and forests for their livelihoods and justifies the need for policies that take into account women's access to and control over land and forest resources as well as women's participation in the management and decision-making concerning the governance of these natural resources. To show its seriousness and commitment to environmental matters, Cameroon has ratified international conventions such as the Convention on Biodiversity and the Millennium Development Goals (MDGs) that have since been named as Sustainable Development Goals (SGSs).

In **Mali**, land and forest tenure is characterized by a large number of conflicting rules and regulations. On one hand there is customary law rooted in traditional beliefs and practices, and statutory law on the other hand, which consists of foreign legal concepts and mechanisms and does not usually take into consideration the socioeconomic conditions on the ground. Reconciling customary practices with legal provisions inherited from the French colonial period and the new laws promulgated since independence is a challenge further complicated by the decentralization process that started in 1991.

In **Kenya**, culture is perhaps the biggest obstacle that prevents women from owning property and access to forest resources. Traditionally, women are not suppose to own land or to be included in the sharing of family land among the sons. This is because women are considered as strangers and are expected to get married. They are not expected to own any much property in their matrimonial homes and even if they work hard and acquire some, that will still be treated as the property of the husband. In terms of forest issues, men are taken as the custodian of forests and are the ones who benefit a lot form the forests. They are engaged in timber harvest and eventual sale to timber merchants. Women on other hand primarily benefit from the forest by collecting firewood, herbs for treatment of various diseases. They also collect fruits, vegetables and other edible berries with which to feed their families

Despite the 2010 constitution giving equal rights to daughters and son when sharing family property, women and girls realistically are still excluded in the sharing of the family property. This confirms that as much as the national legislation empowers women, culture still hold a big sway in the ownership and the distribution of property. In some communities such as the Maasai and the majority of nomadic tribes, the primary duty of women is to bear children and take care of the family. They are not allowed to possess and property and girls can never lay any claim to the family's estate. In most cases, girls are married off at a tender age to fetch dowry wealth to the father. The same applies the Kipsigis of the Rift valley. However, because of breakdown in families and the resultant single parent families headed by women, property can now be owned by women. The same apply to widows who can now inherit the property that was left behind by their husbands. This is not to say there are no situations where the widows are disposed by the relatives of the husband of property that their husbands owned.

2.2.2 Influence of Legislation in conservation and management of forests

Canada has more forested area than nearly any other country in the world and forests are central to its heritage, culture, environment and economy. Conservation and protection is done through sustainable forest management practices and strict national laws. The primary goal of Canada's forest conservation and protection efforts is to preserve the health of this country's wide range of forest ecosystems. Forest land outside formal protected areas is safeguarded by the laws, regulations and policies that all provinces, territories and the federal government have developed to enforce sustainable forest management across the country. Canada recognizes the categories of the International Union for Conservation of Nature (IUCN) which defines various levels of restrictions for land set aside for conservation and protection purposes. Canada has developed national guidelines to apply those restrictions across the country. Federal laws designate and define protected areas. Protected areas are a major component of Canada's national forest conservation strategy. The National Parks Act has been developed in parallel with provincial government legislation and strategies for creating and managing protected areas. About two-thirds of Canada's protected forests lie within national and provincial parks. The rest lies in other types of protected areas such as wildlife reserves. All of Canada's protected area designations, strategies and forest management plans are grounded in science. Scientific research supports development of best management practices. The government and industry incorporate new scientific knowledge into forest legislation and policies in forest management plans. Examples of scientific research related to forest conservation and protection

are forest management practices on marten habitat in Ontario and Newfoundland & Labrador, birds in boreal forests and woodland caribou zones. These studies have influenced management decisions related to harvesting along streams and river, forests and bird sanctuaries.

In **India**, the first Act for the regulation of forests was passed in 1865 by the British. It empowered the government to declare any land covered with trees or brushwood as government forest and to make rules to manage them. These regulations and restrictions are justified only when the advantage to be gained by the public is great and the cardinal principle to be observed is that the rights and privileges of individuals must be limited other than for their own benefit and only in such degree as is absolutely necessary to secure that advantage. This policy prescribed that the claims of communities near forests should not override the national interests. Forests provide sustenance for them in the form of minor forest produce, water, grazing grounds and habitat for shifting cultivation for them. However, their rights were rarely recognized by the authorities and in the absence of real ownership of the land, the already marginalized local dwellers suffered. The reason for this latter phenomenon is the Indian Forest Act (1927) which empowers the government to declare any area to be a reserved forest, protected forest or village forest. The Wild Life Protection Act (1972) allows any area to be constituted as a protected area namely a national park, wildlife sanctuary, tiger reserve or community conservation area. India has shifted the approach of forest management from regulatory to participatory mode of management which is enshrined in the National Forest Policy (1988). This led to the initiation of Joint Forest Management (JFM) programme. However JFMCs suffered from certain flaws such as bye-laws have not been formulated for the functioning of the JFMC. In addition, Minor Forest Produce (MFP) has not been defined neither by the State nor Federal legislature. Ownership rights over minor forest produce (MFP) have been given to Village Panchayats through the Constitution (Seventy-third Amendment) Act (1992) and Panchayat (Extension to the Scheduled Areas) Act (1996). The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, is a key piece of forest legislation passed in India on 18th December 2006. The law concerns the rights of forest-dwelling communities to land and other resources denied to them over decades as a result of the continuance of colonial forest laws in India. The Act has been met with much concern and opposition from environmentalists and wildlife conservationists. Some of this opposition has been motivated by those who see the law as a land distribution scheme that will lead to the handing over of forests to tribals and forest dwellers. But the strongest opposition to the Act has come from wildlife conservationists who fear that the law will make it impossible

to create "inviolable spaces" or areas free of human presence for the purposes of wildlife conservation. On 5 February 2004, the MoEF issued new guidelines for regularization of the rights of the tribals on the forest lands in continuation of the 1990 Guidelines. These supplementary guidelines request the State Governments to give legal recognition to the traditional rights of the tribal population on forest lands and to submit proposals for conferring "heritable but inalienable rights over such lands" on "tribal dwellers who are in continuous occupation of such forest land at least since 31/12/1993".

In **Zambia**, most of environmental legislations were enacted more than thirty years ago and the goals of forestry management were to put in place effective forest management systems and operating resources, to formulate and implement appropriate forest policies and programmes for sustainable management and use of forest resources and to promote participatory management and use of sustainable forests such that all stakeholders including men, women and children take active and sustained interest in effective conservation, production, management and utilization of the nation's forest resources. While some of them have been reviewed several times over the years such as Wildlife Act, some remain in their original format such as Water Act of 1949. Related to most of these pieces of legislation are policies together with designated institutions to administer the individual Acts. The current Forestry Policy was adopted in July 1998 after a review of the one developed in 1969 (GRZ, 1998). The policies aims at increasing the country's forest cover and simultaneously meet the growing local needs for fuel wood, fodder, timber and minor forest products. It advocates for participatory Joint Forest Management. The Forest Act, Cap 199 of 1973 has recently undergone review. The Forest Act (1999) provides for the establishment of the Zambia Forestry Commission to replace the Forestry Department as the administrative body for the Act. It promotes the participation of local communities' traditional institutions, non-governmental organizations and other stakeholders in sustainable forest management and the conservation and sustainable use of forests and trees for the management of forest ecosystems and biological diversity. The Wildlife Policy (1993) provides for the establishment, control and management of National Parks and for the conservation, protection and enhancement of wildlife ecosystems biodiversity (GRZ 1994) and addresses issues pertaining to opportunities for the equitable and sustainable use of the special qualities of National Parks. It also provides for the conservation of wildlife including those species that may sometimes be in conflict with human interests.

The Zambia Wildlife Act No. 12 of 1998 which provides for the establishment of the Zambia Wildlife Authority (ZAWA) with the functions of controlling, managing, conserving, protecting and administering National Parks, bird and wildlife sanctuaries among other responsibilities.

Policy Framework of the year 2000 adopted by the Ministry of Agriculture, Food and Fisheries (MAFF) to formulate the Agriculture Sector Investment Programme (ASIP) whose implementation started in 1996, guides the agriculture sector in Zambia. This policy framework provides clear policy goals and strategies aimed at creating an enabling environment for increased private sector participation in the agricultural sector (GRZ, 1992). The Agricultural Policy Framework of 1990 guides the conservation and management of fisheries resources in Zambia. The Fisheries Act Cap 200 of 1974 seeks to protect fish resources from unsustainable exploitation and to regulate the fishing industry. However, this policy does not cover issues of community participation, threatened or endangered species and biological diversity. Zambia's overall Environmental and Natural Resources Management policy is anchored in National Conservation Strategy (NCS) of 1985 (GRZ, 1985). The NCS's objectives are to ensure sustainable use of Zambia's renewable natural resources, maintain Zambia's biodiversity and maintain essential ecological processes and life support systems. The Environmental Protection and Pollution Control (EPPC) Act was enacted in 1990 and provides for the establishment of the Environmental Council of Zambia (ECZ) whose functions include providing advice to the government on formulation of policies relating to good management of natural resources and the environment. Zambia has also ratified international conventions such as Convention on Biodiversity (CBD) which she ratified on 28 May 1993. Zambia recognizes the significance of the CBD objectives and obligations and has therefore used the Convention as an opportunity to try and integrate these objectives into on-going national policies, plans and programmes.

In **Liberia**, The Poverty Reduction Strategy (PRS) indicates that with respect to economic growth, women are major players in the agriculture and forestry sectors. Women constitute the majority of small-holder producers and the agricultural labour force. Women produce some 60% of agricultural products, carry out 80% of trading activities in rural areas and play a vital role in linking rural and urban markets through their informal networks. Despite this, Liberia's forest policy laws and regulations lack proper mechanisms on how women can play a major role in forest conservation and management. Liberia's Community Rights Law which was intended to increase the role of forest communities in forest governance and management does not mention the direct role women are suppose to play. There is little evidence that the Forest Development

Authority and non-governmental organizations (NGOs) working in the forestry sector have given thoughtful consideration to the need to seriously include women in environmental conservation. Women are not allowed to openly disagree with their male counterparts in meetings. Efforts to increase gender equality by mixing men and women in public fora may not create an enabling environment for women's participation because the presence of men serves as an intimidating factor.

In **Kenya**, the Environmental Management and Coordination Act (EMCA), 1999, is the framework law on environmental management and conservation. EMCA establishes among others the following institutions; National Environment Management Authority, Public Complaints Committee, National Environment Tribunal, National Environment Action Plan Committees and County Environment Committees. The National Environment Management Authority (NEMA) was established as the principal instrument of government charged with the implementation of all policies relating to the environment and to exercise general supervision and coordination over all matters relating to the environment. In consultation with the lead agencies, NEMA is empowered to develop regulations, prescribe measures and standards and issue guidelines for the management and conservation of natural resources and the environment. The Act provides for environmental protection through Environmental Impact Assessment (IEA), environmental audit and monitoring and environmental restoration. NEMA is also the designated National Authority for certain Multilateral Environmental Agreements. Other legislation includes new Forest Management Act (2005) that spells out how forests are to be conserved in Kenya.

2.2.3 Influence of technology in conservation and management of forests.

New technologies have dramatically changed the way information is collected and applied in the forest sector. For example, World Bank experiences from Eastern Europe and South Asia demonstrated the importance of appropriate management and generation of information and the need for information on financial and operational issues, as well as performance assessment of state agencies. Public access to this information is a prerequisite for greater accountability (World Bank 2008, 2005). These lessons gradually resulted in forest management information systems (FMIS) becoming an essential element in forest sector institutional reform programs. These systems were tried in forestry projects in countries as diverse as Argentina, Bosnia and Herzegovina, Kazakhstan, Russia, Romania, Vietnam, and several states in India (World Bank 2008). The systems focused on forest administration.

In **Vietnam**, the Management Information System for the Forestry Sector (FORMIS) aims to introduce modern approaches to information management in the Vietnamese forest sector. This includes technological solutions for information integration, remote-sensing technologies and mobile technologies. FORMIS will contain a number of subsystems and modules to provide information for steering and managing the forestry sector toward sustainable forest management. The FORMIS information strategy will also guide the Ministry of Agriculture and Rural Development in aligning IT investment in other development projects to obtain a harmonized, cost-effective system. FORMIS is expected to reduce the fragmentation of information by harmonizing standards within the agriculture ministry. The project will come up with consistent data structures, standardized and consistent data collection methodologies and centralized coding systems. The fragmented nature of existing forestry information is partially caused by a case-by-case approach when planning and building information systems without having a strategic overview. The project pays particular attention to the initial planning of the information strategy and the information system architecture of the systems to be built.

Finland is one of the world's leading countries in applying ICT across all levels of society and different economic sectors and has a system developed and funded by Metla (a Finnish forest research institute) that is used to prepare and discuss forest management plans with communities. It was first developed to serve as a tool for Metsähallitus (a state entity that manages state forests and most protected areas) for participatory forest management but it has become available to private forest owners for evaluating different management strategies. Developed for holistically evaluating different decision alternatives, it is based on the definition of so-called acceptance borders for decision criteria for example the minimum income from the forest cuttings. Forests have held a remarkable role in Finnish society for over a century. Alongside the rapid overall development of ICT, forest sector actors have actively developed and applied different ICT solutions to improve efficiency. Conventional ICT applications have been developed to support decision making and to improve the efficiency of the wood supply. In general, the readiness for ICT solutions in the Finnish forest sector is very high, which reduces the need for capacity building and technical support in introducing new solutions. The key success factors for ICT solution development and application processes are the involvement of the stakeholders, adequate capacity and a high level of trust between the government and the private forest owners. For developing countries, the Finnish model presents two important lessons: good outcomes from ICT solutions can be expected only through a good communication strategy and

upfront involvement of stakeholders and piloting with a smaller user group is beneficial for the final product quality.

In **Uganda**, technology has been applied in other spheres of the economy but it has been lagging behind in forest management. The high cost and specialized technical skills needed for traditional remote sensing and GIS applications have been a limiting factor while corruption, illegal logging, and other forest crimes are notable governance problems in the country. The lack of avenues for citizens to hold their public office bearers accountable has been cited as one of the governance challenges in the sector. On the other hand, the growth of mobile phone connectivity in the country is being exploited by illegal loggers and poachers. The experience from Uganda also demonstrates how linking ICT and e-readiness assessment with extensive governance diagnostics provide a good basis for reform. Technology has been used in Uganda to successfully lobby against government actions that were deemed detrimental to the environment. In 2007, the government of Uganda wanted to give away a third of the Mabira Central Forest Reserves to a sugar company. At the same time, sensitivity to environmental matters had been heightened in Uganda by the campaigns about the impact of the loss of forests leading to floods, unpredictable weather and rising food prices. As a result, civil society organizations used ICT to alert individuals about official actions that would affect them adversely and to mobilize them to save the Mabira Forest. Environmentalists took their fight to discussion groups on FM radio stations and used text messages to campaign against buying the company's sugar until the plan to grab part of Mabira Forest was dropped. The text messages were particularly effective.

In **Ghana**, a lot of progress with Internet and mobile connectivity has been made but software applications in the forest sector are lacking. A notable exception is The Ghana National Wood Tracking System (WTS) that provides a timber legality assurance system and is an important tool in reducing illegal logging. The system addresses the traceability of wood in on-reserve areas destined for export. However, a chain-of-custody system should track all wood and wood products in circulation in a given market.

The system uses handheld computers in remote forest areas in conjunction with plastic bar coded tree and log tags to capture data such as species, diameter, length, and geospatial location. WTS allows Ghana to demonstrate compliance and control across to their timber supply chains and secure access to premium markets in the European Union and United States. Trees are numbered

(engraved on the tree) and next to the numbering is a white tag that has a barcode with the corresponding number.

In the **USA**, the Carnegie Institution for Science's CLASlite (Carnegie Landsat Analysis System-lite) is a software package designed for highly automated identification of deforestation and forest degradation from satellite imagery. An output from CLASlite include maps of the percentage of live and dead vegetation cover, bare soils, and other substrates, along with quantitative measures of uncertainty in each image pixel. CLASlite converts satellite imagery from its original format through calibration, preprocessing, atmospheric correction, and cloud-masking steps and then performs a Monte Carlo Spectral Mixture Analysis to derive high-resolution output images. Its algorithms easily identify and accentuate areas where clearing, logging, and other forest disturbances have recently occurred. CLASlite does not provide a final "map" but rather a set of ecologically meaningful images identifying forest cover, deforestation, and forest degradation that can be readily analyzed, processed, and presented by the user. While NASA's MODIS Rapid Response system provides near-real-time images and data on global fires in the public domain on the Internet, forest managers in the field would be unable to find the time and technical skills to analyze the data quickly. The University of Maryland developed the Fire Information for Resource Management System (FIRMS) to serve MODIS fire observations to this community. FIRMS displays active fires detected in near-real time using thermal and mid-infrared data from the MODIS instruments. This means the data are processed and available on the web for four to six hours after the satellite passes over. Subscribers can sign up for e-mail alerts on fires in their area of interest. The Web Fire Mapper of FIRMS is an open-source Internet-based mapping tool that delivers locations of hot spots and fires. These can be viewed on an interactive world map showing hot spots or fires for a specified time, combined with a selection of GIS layers and satellite imagery. FIRMS is currently being transitioned to an operational system at the United Nations Food and Agriculture Organization.

In **Kenya**, Ushahidi, which means "testimony" in Swahili, is a platform designed to take input from hundreds of people by mobile phone or e-mail. It uses free software called FrontlineSMS that turns a laptop and a mobile phone into a text-broadcasting hub. As an SMS is sent from a hot zone, the message synchronizes with the Ushahidi software and shows up in a web administrator's inbox. The web administrator can decide to send a text message back to the sender to verify the information, send out a blast alert to large numbers of people or post the information onto a web page with location information from Google Maps (or do all three). This

application gained popularity after Ushahidi became a success story in the aftermath of the Kenyan riots in 2008, as a means of keeping citizens informed on safety and security through information reports from individuals. The success of Ushahidi has led to its replication in other countries for other purposes. The Ushahidi platform combines the benefits of the Internet and mobile phones and could be used to generate near-real-time information on forest crimes, fire, wildlife sightings, and so on. The advantage of mobile SMS-based data input is immense in remote and rural areas.

In **Laikipia County**, a home to the second-largest population of wild elephants in Kenya, conflicts between the wealthy farmers who own large ranches and private conservancies and small agriculturists whose crops are normally destroyed by the elephants are common. To find a viable solution to this situation, the GSMA Development Fund in collaboration with the University of Cambridge, Laikipia Elephant Project, the Laikipia Nature Conservancy, Laikipia Wildlife Forum, Safaricom, Wireless ZT, Nokia, and Nokia Siemens Networks devised a closed-group communication network between the park staff, ranch owners, and farmers in the district with special push-to-talk mobiles. This technology combines the functionality of a walkie-talkie or two-way radio with a mobile phone and enables communication between two individuals or a group of people, as needed, with the push of a single button. With stakeholder consultations and training, the pilot project initiated communication between the Kenya Wildlife Service staff, ranch owners, farmers and NGOs that normally would not take place in a systematic way.

The results of this pilot project proved that improved communication between the various stakeholders significantly reduced human-elephant conflict. Users in the pilot said that the technology provided early warning of elephant raids and allowed the farmers to take preventative actions. Some of the users reported that management response improved, especially by the Kenya Wildlife Service staff. Accountability of the Kenya Wildlife Service staff seems to have increased. The use of this technology was also appreciated by the Kenya Wildlife Service, which reported that receiving reliable information over a larger area helped it to be more effective in the job.

2.2.4 Influence of Religion in conservation and management of forests

Major world religions are powerful tools that play a major role in the conservation and the management of natural resources in many parts of the world. The first page of The Bible, Genesis 1:26, in the story of creation, God gave man an order and authority to rule over the whole world. God gave man the authority to subdue the earth, all the creatures of earth and all its resources. Wilson (1998) observed that by implication this word dominion, man has both domination and stewardship apparatus. Holy Qur'an contains some key chapters and verses that support the conservation of natural resources. These include Fitrah, Mizan and Tauhid, Khalifah and they specifically identify the role of man in resources conservation. In Sumatra, some management policies support the introduction of religious doctrines into land management policies. These areas are Al-Mawat, (land regeneration plan), Harim (for water resource protection), Himoar (for sustainable resources management). (Deb & Malhotra, 2001; Henshey, 2011; Johnson et al., 2001).

Most organized religions were the most environmentally concerned and active (Peterson and Liu 2008). Tomalin (2004) provides an example of sacred grove conservation discourse in India and argues that while protection of sacred groves has been touted as an example of Hindu religious environmentalism, the attitudes and behavior of a majority of middle-class elite Hindus do not demonstrate awareness of the environmental ethic of using natural resources responsibly. Among the established religions, Buddhism and Jainism have been shown to have explicit conservation concerns and consequences (Badiner 1990; Batchelor and Brown 1994; Singhvi 1990; Tobias 1994). Ecological analyses of indigenous cultural practices revealed that in contrast to the modern Western economy based on exhaustive resource use modes, pre-industrial economies of hunter-gatherer-shifting cultivators tend to protect the wild biota and habitats on which they depend for survival. Several ecological-anthropological studies (Callicott 1983; Gadgil 1995; Gadgil and Guha 1992; Gadgil, Berkes and Folke 1993; Kellert 1996; Berkes 1999) content that religious folklores and cosmologies of most indigenous societies maintain a conservationist ethos in order to sustain their natural resource base.

In Cross River State (**Nigeria**), some religious practices in the African Traditional Religion like methods of worship and initiation rites overtly or covertly encourage conservation and management of natural resources. Forbidden areas associated with worship contribute to natural resources conservation and management. Local people have developed a variety of consistent

resource conservation and management strategies in tropical Africa, Asia, and South America in the past (Appiah-Opoku, 2007). Traditional African societies also observed environmental ethics that help in regulating their interactions with the natural environment (Shastri et al., 2002). This is as a result of the activities of rural farmers and multinationals on traditionally protected areas in the forest zones as a result of increasing pressure from the demands of hard wood, agricultural land and forest products. It was further observed that indiscriminate land use including farming is a problem that forest within the state has to contend. While illegal logging of trees and harvesting of non timber forest products (NTFPs) continues to be a major problem in forest reserves, much has been done to reduce this trend. There is threat to wildlife populations in all reserves from illegal hunting, grazing and the activities of local farmers. There is the wanton and indiscriminate exploitation and collection of other forest products like bitter kola, bush mango, cane, camwood, kola nut, chewing sticks and poles (Eneji et al., 2009).

African Traditional Religion (ATR) as done in most part of African communities, are environmentally friendly and sustainable thus contributing so much to natural resources sustainability and conservation. In Africa and indeed Nigeria, the traditional religion holds the strength on the ascription of psychic or supernatural powers to objects called gods and goddesses. The major tenet of African traditional religion and belief system lies in the belief that the abode of the gods and goddesses can be within the community. The community gods may decide to have their abodes on rock, streams, pond, trees, land or anywhere they so desire. The gods choose their followers through the rites of initiation with a core messenger who is the mouth piece of the gods living among human beings. The gods or goddess communicate their will to the people through the juju priest or chief priest. This belief system states that the gods protect the community members from harm, famine, bareness, impotence, drought, epidemics, and war among others. The gods avenge their anger on whoever omits or commits any flaw for which their presence forbids, hence, the cultural system holds all the precepts of the laws of the gods to a very high esteem (Shastri, et al., 2002; Tupper, 2002; Udgaonkar, 2002; Utkarsh et al., 1999; International Institute for Environment and Development, 1992).

For Africans there is no clear separation between what is secular and what is sacred. Everything and every act are looked upon in a religious and customary perspective. Africans view themselves as part of the environment (Mkenda, 2010; Taylor, 2002). Man is conceivable only in this cosmic interweavement. This web of relationship is what makes Africans view the earth as their mother and themselves as her children. Little wonder, Africans refer to their land as mother

earth despite the fact that human nature and the gods are distinct concepts. They belong to some ontological categories that are interrelated and interdependent. Therefore plants, animals, rocks, water and other non-living things are part of nature which is the product of creation deserving to be respected as much as human beings who are also part of nature. This is what makes Africans regard themselves as being in close relationship with the entire cosmos (Taylor, 2002). This position of man being a constituent part of the environment and God's creation is expedient that man must protect the interest of other part of God's creations. This was confirmed by Mkenda (2010) and Snoo and Bertels (2001). Henshey (2011) posited that in traditional African societies like Nigeria, Ghana and many others many people believed that rocks, trees streams, ponds and forests were the manifestation of the power of the Supreme Being. Cox (1995) holds that in traditional African societies there are many shrines and they were associated with big trees such as mimosop, fig trees, baobabs, iroko, and mahogany among others. This forced Deb, et al. (1997) to conclude that these trees together with the vegetation around were preserved as sacred places for worship. Thompson and Homewood (2002) also found out that rocks, ponds, lands, streams and other parts of the environment were also the abodes of the gods. So, shrines, sanctuaries, temples and sacred groves were all meant for the worship, consultation and appeasements of the gods. This was also supported by the findings of Eneji et al. (2009), Paden (2009), Appiah-Opoku (2007) and Kimmerer (2002).

In **India**, indigenous religious traditions seem to have promulgated an ecological ethic built around the dependence of the indigenous communities on local biodiversity. Many plants are conserved in their natural habitat by tribals due to magico-religious belief that they are habitat of god and goddess. The tribal culture prevalent in tribal pockets in Central India has been recorded in Dindori, Balaghat and Mandala districts of Madhya Pradesh and Kawardha and Bilaspur districts of Chhatisgarh states. The survey study reveals that plants and flowers have a profound influence on them. Tribals worship trees and flowers as they believe that God and Goddesses reside in them. Examples of trees and flowers that are believed to be homes and abodes of these deities are Aam(Lord Vidhyadhara), Arjun (Lord Brahma) Bijapura(Lord Brahaspati), Bilva(Lord Shiva), Nimba(Serpent King), Basil(Goddess Lakshmi), Baka(Lord Narayan) ,Karavira(Lord Ganesh) and Nilapadma (Goddess Ambika).Some plants are conserved in sacred groves of tribals as in-situ conservation of biodiversity. The ethnic people of India have played a vital role in preserving bio-diversity of several virgin forests and have conserved several flora and fauna in sacred groves of tribals otherwise these flora and fauna might have disappeared

from natural eco-system. The interference of all kind of human activities is prohibited in sacred groves. In sacred grove of Maharashtra, the giant mango tree that has a branch that looks like trunk of elephant is preserved due to its magico-religious beliefs.

In **China**, by limiting human activity at sacred sites, many traditional societies serendipitously protected biodiversity there as well. A religious association in southwest China is restoring sacred sites by bringing their plant diversity close to that of a nearby nature reserve. Xishuangbanna is a region of China that accounts for only 0.2% of the country's land but has about 18% of its 30,000 plant species. Since the 1950s, the region's tropical forest cover has decreased by about half and about 600 species of plants have gone extinct there. It's most common ethnic group is the Dai people whose polytheistic and Buddhist beliefs traditionally played an important role in conserving local plant diversity. In accordance with the Dai's polytheistic beliefs, each village had a holy hill forest where the gods lived and where hunting, gathering and cutting were prohibited. Today, the region has about 250 holy hills, each of which is about 1,000-1,500 hectares. The researchers surveyed the plants in 28 holy hill forests and found 268 plant species, 15 of which are the most protected in China. The holy hills can be considered as small nature reserve established by the Dai traditional beliefs. In accordance with Buddhist beliefs, each village must have a temple with a garden containing plants related to the religion such as the flowers and fruits used as offerings during ceremonies.

In **Kenya**, there Kaya forests along the coast were created in the 16th century but abandoned in 1940s. They consist of fortified villages that stretched about 200 kilometers. They have been nurtured by the Mijikenda community to protect the sacred groves and graves. They provide a focal point for the Mijikenda peoples and are held as sacred places (Schaaf 1988 and Robertson 1986). Since the abandonment of the Kayas as places of settlements, certain restrictions were placed on the access and utilization of the natural forest resources. As a direct consequence of this action, the biodiversity of this Kayas have been sustained. The Kayas are now repositories of spiritual belief. Because of this reason, cutting of certain species of trees is not allowed and even grazing in some areas. This is not to say that these forests are safe. They still come under threat from illegal loggers and poachers despite the religious significance of these forests.

2.3 Theoretical Framework

Community forest related theory is reviewed in this section. A gender relations perspective regards current social roles as established and maintained through power and authority therefore intrinsically contested and dynamic (Locke 1999). A gender slant is appropriate study because of access, use and resource management are prescribed by gender. Women form part of the gender and it is they who come into close contact with the environment because of the societal duties that are expected of them in the daily activities.

As part of gender analysis, a feminist environmental perspective is used. This includes Women in Development (WID) and Women and Development (WAD). Others reject the concept of women and men unitary categories. This idea is also pertinent to the present discussion of women's roles in forest management. In addition, women are not a homogenous group because they can be stratified by caste, education, religion, colour, marital status and economic standing. These are some of the factors that may contribute to the hindrance of their conservation and management efforts in forestry and other environmental issues (Agarwal 1997, Jackson 1993, Locke 1999).

Ecofeminism movement is also applied. This is a term that was coined by French feminist writer Françoise d'Eaubonne in 1974 and it is the only movement that combines multiple social movements and it is seen as the connection of the environmental movement and the feminist movement. However critics like Bina Agarwal (1998) and Rosi Braiduti (1994) argue that ecofeminism has focused too much on ideological arguments and failed to address power and economic differences that contribute to differentiation among women. Bina Agarwal sees feminist environmentalism as an alternative concept which insists that the link between women and the environment should be seen as structured by given gender, class, caste, race, organization of production and distribution.

2.1 Conceptual Framework

The conceptual framework is developed from culture, religion, technology and legislation

Independent Variables

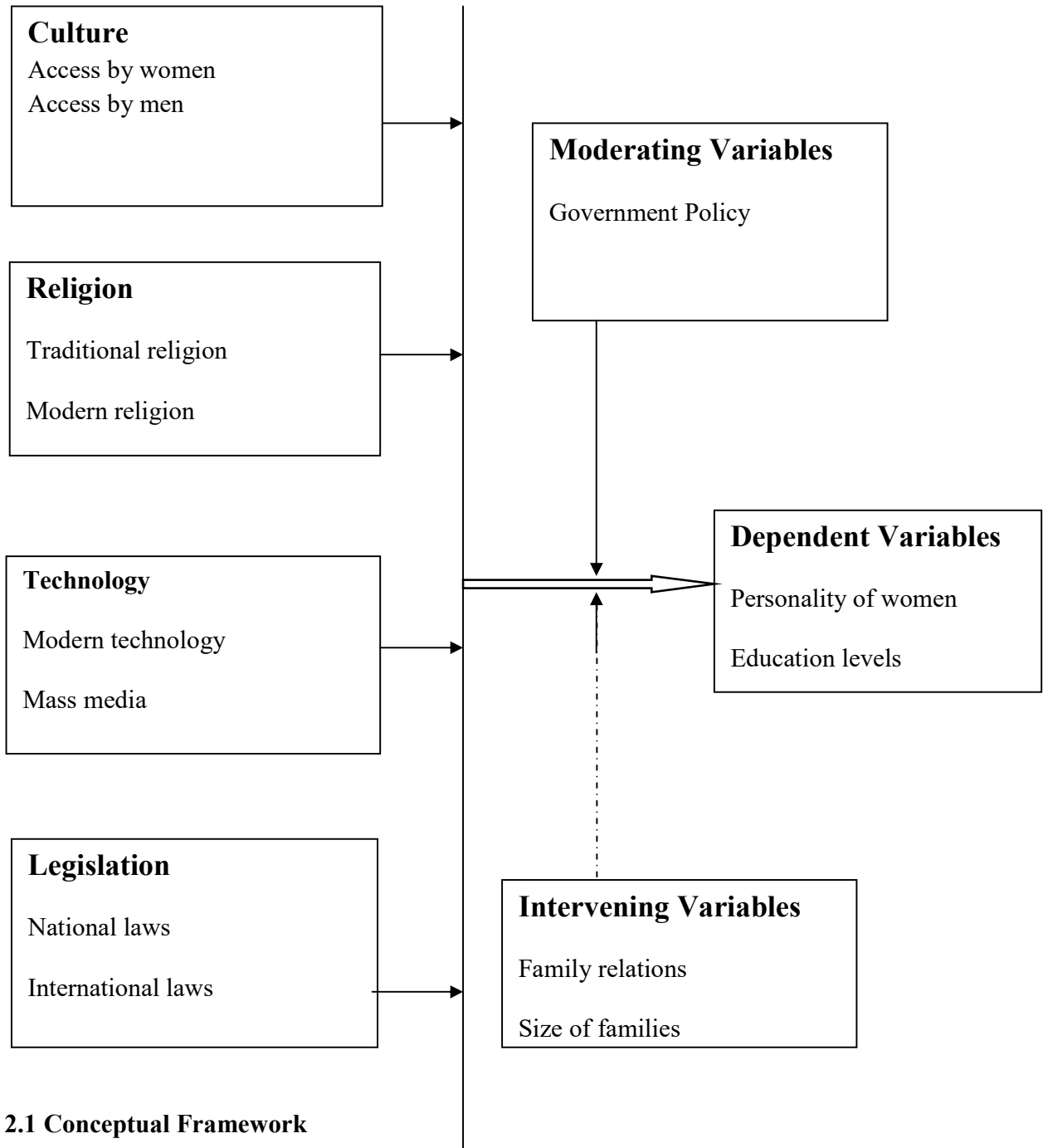


Figure 2.1 Conceptual Framework

2.2 Operationalization of Variables

The involvement of women on development of Community Forestry Management is influenced by culture which influences the attitudes of women towards forest conservation and management; technology which influences the process and the method of sharing of information on forest conservation and management; religion which has significant role in the conservation and management of forests and legislation which play a key role in the conservation and management of forests. However the government policy may work against the involvement of women on the management and conservation of forests.

Table 2.2 Operationalization of variables

Dependent Variables

Objectives	Variable	Indicators	Measures	Scale
Factors influencing the involvement in the management and conservation of forests in Chepalungu Constituency, Bomet County.	Involvement of women in forest conservation and management	Sustainable forest management	To know the current performance of women in forest management	Interval

Table 2.3 Independent Variables**Independent Variables**

Objectives	Variables	Indicators	Measurements	Scale
i) To examine the extent to which culture influences the involvement of women in the management and conservation of forests.	Number of women involved	Participation in forest activities	If women are participating in forest conservation and management	Ordinal
ii) To assess the extent to which religion hinders women involvement in forest management and conservation.	Type of religion practiced	Religious practices done in forests	Number of women in conservation	Nominal
iii) To assess the extent to which legislation hinders women from participating in forest conservation and management.	Types of legislation	Few women in conservation	Contribution to forestry and environmental legislation	Ordinal
iv) To assess the influence of technology in forest conservation and management	Levels of technology Types of technology	Number of trees being cut	Number of technological gadgets used in conservation	Nominal

2.6 Summary of Literature Review

The need to include and give a bigger say to women in the management and conservation of forests has been recognized. The government has come to the realization that women, as much as they are being looked down by their male counterparts, they do play a hugely significant role when they are presented with an opportunity and well empowered. Women are closer to the environment because they are the ones who do much of the household. They are the ones who are responsible for preparing food to the family and ensuring the general health and welfare of the entire household. They collect firewood, herbs, fruits and berries that are beneficial to them. Because they are the ones who have to worry about where to get firewood, they always want to see the forests and the general environment being conserved as it reduces the amount of time that they spend in search of firewood. As a result, women have an essential role to play in the development of sustainable and ecologically sound consumption and production patterns and approaches to natural resource management. (United Nations Conference on Environment and Development and the International Conference on Population and Development Agenda 21).

Women remain largely absent at all levels of policy formulation and decision-making in natural resource and environmental management, conservation, protection and rehabilitation and their experience and skills in advocacy for and monitoring of proper natural resource management too often remain marginalized in policy-making and decision-making bodies, as well as in educational institutions and environment-related agencies at the managerial level.

Women are rarely trained as professional natural resource managers with policy-making capacities such as land-use planners, agriculturalists, foresters, marine scientists and environmental lawyers. Even in cases where women are trained as professional natural resource managers, they are often underrepresented in formal institutions with policy-making capacities at the national, regional and international levels. Often women are not equal participants in the management of financial and corporate institutions whose decision-making most significantly affects environmental quality. In 2002, women in Mpigi district, Uganda, on a quest to bring resources together for the sake of their families and conservation, decided to form a steering committee to oversee their crafts programme. The women mandated FOMAF to oversee the programme. The women also decided to implement an Ecotourism and environmental education for schools programme.

Membership to the crafts programme stands at approximately 200 women, translating to a representation of 190 families. The environmental education programme has reached 17 schools of the about 100 in Mpigi district. Approximately 1000 seedlings of *Moringa* tree and 200 seedlings of the Neem tree have so far been planted by members. A further 3000 seedlings of *Setala* tree and 1500 of Eucalyptus have been distributed around the district.

Women through the sustainable crafts programme have contributed to conservation of Mpanga forest reserve. The project was able to train 200 women in making export quality crafts using local materials. These are exported to Europe or sold in the local tourist destinations at fairer prices than they would fetch if sold locally. Thirty trainers were also trained. Their works is to follow-up the craft project and show other women ways of producing high quality craft products that will fetch better prices in the international markets. There is a realization that there is a strong link between women participation and environmental conservation and development (Kaudia and Obonyo). Women are linked to with natural resources than men. Their traditional gender roles bring them in daily contact with natural resources such as water, forest and wildlife. When these resources are destroyed, it is the women who suffer most. This therefore implies that women involvement in conservation and management of forests should be emphasized at all levels.

In Chepalungu constituency, the role and participation of women in forestry management is limited and no investigation has been done to ascertain the factors that hamper their involvement.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the methodology used in the study. It also describes the research design, target population, sample size and the sampling procedures, research instruments, piloting of the study, reliability of research instrument, data collection procedures, data analysis technique and ethical considerations.

3.2 Research design

This is the blue print for the collection, measurement and the analysis of the data. The study used a descriptive survey design. This was suitable to the study because the data was collected with the aim of describing the nature of existing conditions, identify the standards against which the existing conditions can be compared and determine the relationship existing between the specific events (Orodho 2005).

In addition, the study sought to uncover the factors involved in a given situation, the degree to which they exist and the relationship among them (Travers 1996). This design was suitable because the objectives are systematic or description of facts and characteristics of a given population area of study were accurate and factual.

3.3 Target Population

The research study was carried out among the Divisional Forest Officers (DFOs), Forest Executive Committees (FECs) and Community Forest Users Group (CFUGs) of forests in Chepalungu Constituency of Bomet County. The people who were targeted were women who are the members of CFAs because they have a substantive content relating to community forest management and the general population who live next to the forest. The other target population was forest guards who are mandated by law to watch over forests. The target population consisted of 100 Forest Department Officers Forest and guards, 420 Executive Committees and 425 CFUGs making a total of 945 people.

3.4 Sampling size and sampling procedure

This section provides the sampling size that the researcher used in the study. In addition, it gives the sampling procedure that was followed in drawing up the sample to be used in the study.

3.4.1 Sample size

A sample is subset of a particular population Mugenda and Mugenda (2003). Generally, the sample size depends on the factors such as the number of variables in the study, the type of research design, the method of data analysis and size of accessible population. Gay in Mugenda and Mugenda (2003) suggests that for correctional studies, 30 cases or more are required; for descriptive studies, 10 percent of the accessible population is enough and for experimental design at least 30 cases are required. Since this study was descriptive in nature, the researcher sought to use a sample size equivalent of 10% of the target population, giving a sample size of 100 respondents. The sample that was used in the study was made up of Divisional Forest Officers (DFOs), Forest Executive Committees and Community Forest Group Users (CFUGs) guards of Chepalungu Forests, women and general population who border the forest.

3.4.2 Sampling procedure

Sampling refers to the process of selecting subjects of study from a population so that by studying the sample, one can generalize the results back to the population from where the sample was drawn Kothari (2004). This study employed probability sampling design; a design of sampling in which each item from the target population was accorded equal chance of being included in the final sample, hence ascertaining objectivity in sample selection.

3.5 Research Instruments

The researcher used questionnaires and interviews to obtain data from the DFOs, FECs and CFUGs forest guards, women and general population who live near the forest. A questionnaire is a set of questions to which a respondent is required to respond (Mugenda 1999). Interview is a process where a respondent is subjected to a set of verbal questions as the researcher listens and takes notes. Questionnaires were taken to the area of study and given to the sampled respondents to respond to. At the same time, the researcher supplemented the questionnaire with interview. Kothari (2008) points out that questionnaires can be taken as being more objective as compared to interviews since they gather responses in a standardized way while at the same time ensuring confidentiality. The researcher used also use both open-ended and close-

ended questions to collect the data. Close-ended questions are presented in four Likert-scales so as to allow respondents some degree of agreement or disagreement.

3.5.1 Piloting the study

A pilot study was done in Siongiroi Division, Bomet County. Therefore, a pre-test sample of tenth of the sample with similar features was appropriate for carrying out a pilot study (Mugenda and Mugenda 2003). The designed questions were administered to DFOs, FECs and CFUGs few forest guards, women and some people from the general population. The researcher used split technique by randomly dividing the sample into two sets and then administering the instrument to each group to respond to. This aided the researcher in checking the consistency by comparing the responses obtained from each half.

3.5.2 Validity of the research instruments

Validity in research is a judgment regarding the degree to which the components of the research reflect the theory, concept or variable under study. This is the degree to which the test measures the variables it claims to measure (Kothari and Pacs 1998). In this study, internal, content and construct validity were taken into consideration. Content validity is the degree to which the data collected using particular instruments present a specific domain of indicators or content of particular concept (Mugenda and Mugenda 2003). Opinions of Division Forest Officers, officers from KFS and Forest Extension Officers were used to check the questionnaires so as to ascertain if all of the objectives were captured in order to assess the content validity.

3.5.3 Reliability of research instruments

Reliability is the consistency of research instruments of measurement over time whether it provides the same results on repeated trials. It is a measure of the degree to which a research instrument yields consistent results after repeated trials (Mugenda and Mugenda 2003). An instrument is reliable if it can measure a variable accurately and consistently and obtain the same results under the same conditions over time. The split-half technique was used to determine the reliability of instruments. The same questionnaire was administered to the same sample which was randomly divided onto two halves. Thereafter, the researcher used the Pearson's Product Moment Correlation Co-efficient to compare the correlation between the total set scores. A coefficient of 0.7 was considered appropriate.

3.6 Data Collection Procedures

The researcher collected data from the selected respondents after seeking consent from the forestry department and obtaining a research permit from the relevant authority that is the Ministry of Education, Science and Technology which issued permit to allow collection of data. This was done after getting the sample population. The researcher requested the respondents to fill the questionnaires as honestly as possible. Follow up was done to check if the questionnaires were fully filled. More time was given to the respondents to enable them fill the questionnaire as exhaustively as possible. Data collected is presented in form of frequency tables and percentages for easier understanding and interpretation.

3.7 Data analysis techniques

This is the process of by which the researcher interpreted the collected data in a systematic way so as to make sense out of it. Questionnaire was used to collect the data apart from using interviews in some situations where the other tool was deemed insufficient or exhaustive enough to collect enough data. The data collected was qualitative but was converted to quantitative one to allow for easier analysis. The researcher, before starting the process of analysis, checked for the completeness of the questionnaire and interview responses. Serial numbers were allocated to the questionnaires to allow for the ease of analysis.

Descriptive statistics, where percentages and frequencies are used, were used to analyze the data. This was appropriate for the study since descriptive statistics helped in the description, analysis and interpretation of the situations the way they are at the time of the study. Finally, the data collected was organized, cleaned, edited and analyzed using the SPSS statistical software.

3.8 Ethical considerations

The researcher obtained permit from the KFS in Chepalungu sub-county office. This enabled the researcher to proceed with the process of carrying out the study. The researcher introduced himself to the respondents, briefed them on the study and explained to them the purpose of the carrying out the study. The information collected was treated with a lot of confidentiality. The names and any form of identity of the respondents were concealed and will not be revealed under any circumstances. The respondents were treated with a lot of respect, dignity and all humanness in order to win their trust that improved the quality of the data collected. The information that was obtained was used only for academic and not any other purpose. Concerns of the

respondents were adequately addressed bearing in mind the financial and legal implications of not adequately addressing confidentiality and privacy issues.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATION, PRESENTATION AND DISCUSSION

4.1 Introduction

This chapter gives detailed data analysis, interpretation and presentation and discussion. Data analysis was undertaken with consideration of the variables that informed the study. These variables were; influence of culture on forest conservation and management, influence of religion on forest conservation and management, influence of legislation on forest conservation and management and influence of technology on forest conservation and management in Chepalungu Constituency of Bomet County.

4.2. Questionnaire return rate

In this study, the researcher administered 100 copies of questionnaires to the respondents upon which 95 were completed and received back, giving 95% response rate. According to Mugenda and Mugenda (2003), response rate refers to percentage subjects that respond to the research instrument. A response rate of 50% is deemed adequate for analysis and reporting; a response rate of 60% is good and a response rate of 70% is considered very good. In the light of this, the study is characterized to have given a superior questionnaire response rate.

4.3. Demographic Characteristics of the Respondents.

In this study, demographic characteristics of the respondents were considered significant as they generally predispose people to display certain unique behaviour patterns in their role as forest managers and environmental conservationists. Such demographic features considered in the study include gender, age, marital status, level of education and religion.

4.3.1 Characteristics of the Respondents by Age

The researcher assumed that the age diversity of the respondents would be of great significance to the study because the active or passive involvement in the management and conservation efforts is to a large extent influenced by how old someone is.

It is also assumed that the roles that the various age groups play in the conservation and management efforts is influenced by their interests and the likely benefits from the forests. On

the basis of this perception, the respondents were requested to complete the questionnaire indicating their ages and Table 4.1 illustrates their responses.

Table 4.1. Characteristics of the respondents by age

Age in years	Frequency	Percentage
18-25	10	10.5
26-33	15	15.8
34-41	15	15.8
42-49	35	36.8
50 and above	20	21.1
Total	95	100

Table 4.1 indicates that of the 95 respondents, 10 (10.5 %) fall in the age bracket of 18-25 years. 15 of the respondents are in the age bracket of 26- 33 years (15.8%). Another 15 (15.8 %) are between 34- 41 years. 35 of the respondents are in the age bracket of 42-49 making 36.8 %. The remaining 20 of the respondents fall in the age bracket of 50 years and above comprising 21.1%.

The above statistics imply that those between 18-25 years have an indifferent attitude to environmental and forestry matters because they are still young and majority of them are unmarried and not directly affected by environmental issues because they do not have to worry on what to cook with or what to feed their children to. Therefore environmental matters least bother them.

The number in the next age bracket of 26-33 and 34-41 years has increased because these are respondents who are married and they begin to take an interest in matters of forest and environment. This is due to commitment to family and the need to provide food for their children and spouses which in most occasions is cooked using firewood or charcoal which come from the forest. Those of 42 years and above do form the bulk of the married and they deal with matters of the family and are directly affected by forestry issues because they get fuel and food from the forest.

4.3.2. Characteristics of the respondents by marital status

This characteristic was of great importance to the study as it would help reveal the extent to which marital status of the respondents would influence the involvement in the management and conservation of forests and the general environment. Because of this, the respondents were asked to complete the questionnaire and Table 4.2 illustrates their responses.

Table 4.2 Marital Status of the Respondents

Marital status	Frequency	Percentage
Married	50	52.7
Single	15	15.8
Divorced	5	5.2
Widowed	20	21.1
Others	5	5.2
Total	95	100

In Table 4.2, it is revealed that 50 (52.7%) of the respondents who filled the questionnaire were married, 15 (15.8%) were single, 5 (5.2%) were divorced 20 (21.1%) were widowed and the remaining 5 (5.2%) represented other marital orientations including the separated but not divorced. The above figures imply that majority of people who are married are assumed to have children which make them have added responsibility of caring for children. The major duty for these people is provision of meals for their children and the major source of fuel and charcoal is the forest. Forests for them are a source of fruits which supplement their diets. It is also a source of leaves, roots and barks that are used in making herbs which are used to cure various diseases. The respondents who are single may not have children and therefore do not have an added duty that comes with children. As a result, for them, they do not care much about forests and the general environment because they are least affected by it. The widowed ones who make up 21.1% have children and they also rely on forest for various products such as wood fuel and charcoal; timber for construction; fruits and berries that help in supplementing the diet of their families and medicinal roots and leaves for treating ailments. The divorced ones who make up 5.2 % are assumed to have psychological problems that are associated with break up of their families and even though they may want to care for to care for the environment, they may not have the time and heart to do so because of their priority that may be on how to bring their

families back together and therefore environmental issues rank last for them. However, this is not to say all divorced people do not care about the environment.

4.3.3. Characteristics of Respondents by Gender

The researcher considered gender of the respondents as crucial to the study because for it was assumed that gender would influence their involvement in forest conservation and management. The respondents were requested to complete the questionnaire indicating their gender and their responses captured in Table 4.3

Table 4.3 Characteristics of the respondents by Gender

Gender	Frequency	Percentage
Male	30	31.5
Female	65	68.5
Total	95	100

Table 4.3, a higher number of 65 (68.5%) of the respondents who filled the questionnaire stating their gender as female were chosen because the study is trying to investigate factors influencing the involvement of women in forest conservation and management. 30 of the respondents (31.5%) were male. The assumption is that since the study is about women and the environment, a bigger number of them would give a better understanding in what they go through on daily basis with environmental matters. The feminine gender is closer to the environment because they are the ones who are tasked with taking care of their families through the provision of food, medicine and water. These resources are closely related to the forest because they are obtained from there (in the case of firewood) and water from where rivers originate. The same is true for the medicinal leaves and roots that are obtained from the forests. The women are likely to be hit most adversely by the collapse of forests since they will lack constant source of firewood and charcoal; fruits and berries that are used as food and herbs that are obtained from trees and shrubs. The masculine gender who make up 31.5 % of the respondents on the other hand do not have a very close connections to the forest because they are culturally not tasked with care of the family through provision of food and firewood. The men care mostly about the timber and logs

that are sold so as to make money which may not necessarily be used to take care of their families. They are also interested in getting charcoal that they sell to make money that may be used for other uses other than taking care of their families.

4.3.4: Characteristics of the respondents by level of education

Level of education was taken as a crucial determinant on the involvement in the conservation and management of forests. The researcher has assumed that levels of education have an influence whether or not one takes an interest in environmental and forestry issues. The respondents were therefore asked to complete the questionnaire indicating their level of education and Table 4.4 displays their responses.

Table 4.4: Characteristics of the respondents by level of education

Level	Frequency	Percentage
Primary	5	5.3
Secondary	45	47.3
College	30	31.6
University and above	15	15.8
Total	95	100

In Table 4.4, of the 95 respondents who completed the questionnaire indicating their level of education, 5 (5.3%) had primary school level education; 45 (47.3%) had secondary education; 30 (31.6%) had college education and 15 (15.8%) had university education and above. The majority of the respondents who form 47.3% have secondary education. They therefore have a better understanding of forestry and environmental issues because they were taught such in Secondary School curriculum. This gives them the base with which to appreciate and understand environmental and forestry matters. The same applies to those who have college education who constitute 31.6% and those with university education (15.8%). These are people who have a deep understanding of environmental issues such as global warming, Green house gases, effects of environmental pollution and other negative effects of forestry destruction and depletion. This shows the higher educated a person is, the better they understand and appreciate environmental issues and will take a very intimate view about it. They therefore understand the value of

inclusivity in forest conservation and management. On the hand, those who have levels of education that can be categorized as low show a lot of apathy to forestry and environmental matters and do not appreciate issues such global warming, green house gases, effects of pollution and effects of general environmental destruction because their levels of education has not exposed them to importance of such concepts. They care for what they get from the forest and not what happens to the forest afterwards.

4.3.5: Characteristics of the respondents by religion

Religion which is subscribed to by the respondents was taken as an important component in the study because it was assumed to have a lot influence on attitudes towards environmental conservation and general issues about forestry management. The respondents were therefore asked to complete the questionnaire indicating their religious inclinations and Table 4.5 displays their responses.

Table 4.5: Characteristics of the respondents by religion

Religion	Frequency	Percentage
Roman Catholic	40	42.1
Protestant	40	42.1
Traditional faiths	10	10.5
Others	5	5.3
Total	95	100

In Table 4.5, 40 of the respondents (42.1%) are of the Roman Catholic faith and is equivalent to the respondents who profess the protestant religion (42.1%) such as Pentecostal Assemblies of God, Church of God, African Gospel Church, African Inland Church and many other protestant churches which are many and deeply varied in their doctrines and practices. These results show that this is an area that has one predominant religion of Christianity clustered into various sects and cults. Another 10 of the respondents (10.5%) subscribe to traditional religion which involve the worship of the local god *Asis* (The Sun) together with all aspects of traditional worship such as offering of sacrifices and holding worship in prescribed holy places together with the

accompanying rituals. The remaining 5 of the respondents (5.3%) are of other minority faiths which include Islam and other insignificant religions.

4.4. Influence of culture on women involvement in forest conservation and management.

The researcher wanted to know from the respondents if culture influences women involvement in forest conservation and management and their responses are tabulated in Table 4.6

Table 4.6 Responses on influence of culture on women involvement in forest conservation and management

Rating	Frequency	Percentage
SA	45	47.4
A	30	31.6
D	10	10.5
SD	10	10.5
Total	95	100

From the above, 45 of the respondents (47.4 %) strongly believed the prevailing culture plays a major role on women involvement the conservation and management of forests. 30 of the respondents (31.6 %) agreed that local culture plays a role in the conservation and management of forests while 10 of the respondents (10.5%) disagreed and an equal number of 10 (10.5%) strongly disagreed. This shows that the local culture is a strong element that influences women involvement in forestry and conservation efforts and management. This is true because it culture that assigns roles to both genders of the society. Culture also influences the sharing of the forest products. Some of the most important of the forest products are firewood, mushrooms, honey, berries, herbs, posts and timber. Women are more likely to be interested in firewood because it is they who do most of the cooking in the family because that is their cultural duty. They are also interested in herbs and leaves with which they can use to cure minor ailments in the family and especially of their children because they are family physicians. They are also likely to collect mushrooms, herbs, honey, shoots and leaves with which to supplement the family diet because it they who are closer to the children than the men are likely to be. Men on the other hand are more interested in forest products such as posts, timbers, twines because traditionally it is they who are to build homes, put up fences and these products are the ones used by men when they are carrying out these duties. It is culture that dictates and shares out duties that are to be carried by

both masculine and feminine gender. Men are also likely to harvest logs from the forests to sell to timber merchants and also burn charcoal that they sell in order to provide for the needs of the family because men are expected to be the breadwinners of the family more than the women.

4.4.1. First hypothesis on influence of culture on women involvement in forest conservation and management

H₁: Culture influences women involvement in forest conservation and management in Chepalungu Constituency, Bomet County.

Table 4.7 Observed and Expected responses on relationship between culture and women involvement in forest conservation and management

Likert-Scales	1	2	3	4
Observed (O)	45	30	10	10
Expected (E)	23.75	23.75	23.75	23.75

The Expected figure (E) is obtained by dividing the number of respondents who are 95 by the four Likert-Scales i.e. 95/4 and it gives a figure of 23.75

Table 4.8 Chi-square testing for the first hypothesis

O	E	(O-E)	(O-E) ²	(O-E) ² /E
45	23.75	21.25	451.56	19.01
30	23.75	6.25	39.06	1.64
10	23.75	-13.75	189.06	7.96
10	23.75	13.75	189.06	7.96
				$\sum (O-E)^2 = 36.56$

$X^2C = 36.56 > X^2_{\alpha 0.05} = 7.185$ at 3 degrees of freedom and 95% level of confidence.

The calculated Chi-square value of 36.56 is greater than the critical value at 95 % level of confidence. Therefore the alternative hypothesis that there is significant relationship between

culture and women involvement in forest conservation and management in Chepalungu Constituency of Bomet County is accepted. The null hypothesis, H_0 is therefore rejected because there is a significant relationship between culture and women involvement in forest conservation and management. Nickerson (2000) say that a commonly held misconception is that failing to reject H_0 suggests that H_0 is true.

4.5 Influence of religion on women involvement in forest conservation and management.

The researcher wanted to know from the respondents if religion influences women involvement in forest conservation and management and their responses are tabulated in Table 4.9.

Table 4.9 Responses on influence of religion on women involvement in forest conservation and management

Rating	Frequency	Percentage
SA	45	47.3
A	20	21.1
D	15	15.8
SD	15	15.8
Total	95	100

From the above, 45 of the respondents (47.3%) strongly agreed that local religion influences a lot on women involvement in the conservation and management of forests while 20 of the respondents (21.1 %) agreed that religion influences women involvement in forest conservation and management. 15 of the respondents (10.5%) disagreed that religion influences the conservation and management of forests by women and the remaining 10 of the respondents (10.5%) strongly disagreed that religion influences the conservation and management of forests by women. This can be concluded that the local people are closely connected to the forests which they use for their own traditional rites such as circumcision. Circumcision in the local community is done in particular place of the forest under some under some sacred groves made up of trees that are considered to be sacred and these are places that are believed to be the home of the local god *Asis*. The same sacred groves are used to offer sacrifices to *Asis*. These sacrifices can be in times of calamity or just to thank the god for protection and blessing to the people. So by default forests are protected. It also implies that the adherents of mainstream religions also use forests to carry out religious obligations. An example is when Christians are fasting and they

may seclude themselves and conduct prayers far away from the rest of the population because the Bible urges them to do so when they are facing very tough issues. They may also seclude themselves from their families and friends when they want to do special prayers that involve fasting or when they just want to do meditate and contemplate on their religious life. The forests can also offer place that the religious go to conduct their prayer retreats because the forest is cool and quiet. The religious leaders such as pastors and Imams do also encourage their adherents to keep the environment a part of their religious obligations. They urge to plant trees and generally keep the environment clean because the physical holiness is a precursor to the spiritual holiness. These are teachings that are infused on their sermons.

4.5.1. Second hypothesis on influence of religion on women involvement in forest conservation and management.

H₁: Religion influences women involvement in forest conservation and management in Chepalungu Constituency, Bomet County.

Table 4.10 Observed and Expected responses on relationship between religion and women involvement in forest conservation and management.

Likert-Scales	1	2	3	4
Observed (O)	45	20	15	15
Expected (E)	23.75	23.75	23.75	23.75

Table 4.11 Chi-square testing for the second hypothesis

O	E	(O-E)	(O-E) ²	(O-E) ² /E
45	23.75	21.25	451.56	19.01
20	23.75	-3.75	14.06	0.59
15	23.75	-8.75	76.56	3.22
15	23.75	-8.75	76.56	3.22
$\sum (O-E)^2 = 26.04$				

$X^2C=26.04 > X^2_{\alpha 0.05}=7.185$ at 3 degrees of freedom and 95% level of confidence.

The calculated Chi-square value of 26.04 is greater than the critical value at 95 % level of confidence. The null hypothesis H_0 that there is no relationship between religion and women involvement in forest conservation and management is rejected. Therefore the alternative hypothesis H_1 that there is significant relationship between religion and women involvement in forest conservation and management in Chepalungu Constituency of Bomet County is accepted.

4.6 Influence of technology on women involvement in forest conservation and management.

The researcher wanted to know from the respondents if technology influences women involvement in forest conservation and management and their responses are tabulated in Table 4.12

Table 4.12 Responses on influence of technology on women involvement in forest conservation and management

Rating	Frequency	Percentage
SA	36	37.9
A	30	31.6
D	14	14.7
SD	15	15.9
Total	95	100

Of the 95 respondents, 36 of them (37.9%) strongly agreed that technology influences a lot on women involvement in forest conservation and management and another 30 of the respondents (31.5%) agreed that technology has an influence on women involvement in forest conservation and management. 14 of the respondents (14.7 %) disagreed that technology has an influence on women involvement forest conservation and management. The other 15 respondents who make up 15.9 % strongly disagreed that technology has an influence on women involvement in forest conservation and management. The technology in question is like the use of cell phones for communication by the forest guards and the use of computer software for the storage and analysis of data on forests and environment which highly influences forest and environmental conservation efforts and decisions. In follow up interview to the respondents, they expressed the need to embrace other sophisticated technology such as use of satellite imagery and GPS tracking devices to monitor illegal loggers and other forms of forest destruction. They also felt that the government should allocate sufficient funds to forest conservation efforts because forests

are under serious threat from illegal loggers and charcoal burners who are out to exploit and exterminate forests for their selfish gains.

Technology also involves the use of social media apps such as Facebook, Twitter and Whatsapp. These applications are found in cell phones that are owned by many people. Majority of those who own them are the youth who use for socialization and men because of higher levels of education. Women also own these gadgets but it is a very small section of them because of the low levels of education and may not know how to manipulate these devices. They mostly use these devices to make calls and not much of share or to search information. Even if they own these devices, it is their spouses who take control of them and women hardly have absolute control over them. These gadgets are used, apart from other uses, to share matters on environment such forest fires, illegal logging, serious cases of erosion, illegal dumping of wastes and other aspects of environmental destruction and mismanagement. Because of the low levels of education among the women, most environmental issues shared on the social media escape them and they rely on their literate spouses and their literate peers or children to get to know what is going on about the environment. Women therefore lose out on most matters on the environment due to their low levels of education that deny them the chance to know what is going on in their surrounding environment.

4.6.1 Third hypothesis on influence of technology on women involvement in forest conservation and management

H₁: Technology influences women involvement in forest conservation and management in Chepalungu Constituency, Bomet County.

Table 4.13 Observed and Expected responses on relationship between technology and women involvement in forest conservation and management

Likert-Scales	1	2	3	4
Observed (O)	36	30	14	15
Expected (E)	23.75	23.75	23.75	23.75

Table 4.14 Chi-square testing for the third hypothesis

O	E	(O-E)	(O-E) ²	(O-E) ² /E
36	23.75	12.25	150.6	6.31
30	23.75	6.25	39.06	1.64
14	23.75	-9.75	95.06	4.00
15	23.75	-8.75	76.56	3.22
$\sum (O-E)^2 = 15.17$				

$X^2C=15.17 > X^2_{\alpha=0.05}=7.185$ at 3 degrees of freedom and 95% level of confidence.

The calculated Chi-square value of 15.17 is greater than the critical value at 95 % level of confidence. The null hypothesis H_0 that there is no relationship between technology and women involvement in forest conservation and management is rejected. Therefore the alternative hypothesis that there is significant relationship between technology and women involvement in forest conservation and management in Chepalungu Constituency of Bomet County is accepted.

4.7 Influence of legislation on women involvement in forest conservation and management.

The researcher wanted to know from the respondents if legislation influences women involvement in forest conservation and management and their responses are tabulated in Table 4.15

Table 4.15 Responses on influence of legislation on women involvement in forest conservation and management

Rating	Frequency	Percentage
SA	55	57.9
A	35	36.9
D	3	3.1
SD	2	2.1
Total	95	100

From Table 4.15, 55 of the respondents (57.9 %) strongly agreed that Kenya has laws that influence women involvement in environmental conservation and management while 35 of the respondents (36.8%) just agreed that Kenya has laws governing environmental conservation and management that influence the involvement of women in forest conservation and management. 3 of the respondents (3.1%) disagreed with the notion that Kenya has laws that influence women involvement in environmental conservation and management. 2 of the respondents (2.1%) strongly disagreed that Kenya has laws that influence women involvement in environmental conservation and management. The conclusion is that many of the respondents are aware of the legislation that exists in the country about environment and what their provisions are. A follow up interview did confirm that they indeed know these laws as much they as they did not know how they specifically influence the conservation efforts in the local community. However, most of the respondents who were women expressed a higher level of ignorance about the existence of the laws and could not quote even a single piece of legislation neither could they identify the body that is charged with the protection of forests in the country that is Kenya Forestry Service (KFS) and that which is charged with watching over the environment which is NEMA. This is attributed to factor such as low levels of education and the general exposure that they lack.

This implies the failure by women to understand the legislation governing forests is a hindrance to the effective involvement by women in the conservation and management of forests. These laws are not known by the majority of the women respondents. The worst part with these laws is that they are not only discriminative against women who are already put down by the low levels of education and the prevailing oppressive culture but do not also do not anticipate any affirmative action for women in environmental management.

4.7.1 Fourth hypothesis on influence of legislation in forest conservation and management

H₁: Legislation influences women involvement in forest conservation and management in Chepalungu Constituency, Bomet County.

4.16 Observed and Expected responses on relationship between legislation and women involvement in forest conservation and management

Likert-Scales	1	2	3	4
Observed (O)	55	35	3	2
Expected (E)	23.75	23.75	23.75	23.75

Table 4.17 Chi-square testing for the fourth hypothesis

O	E	(O-E)	(O-E)²	(O-E)²/E
55	23.75	26.25	689.06	29.01
35	23.75	11.25	126.56	5.33
3	23.75	-20.75	430.56	18.13
2	23.75	-21.75	473.06	19.99
				$\sum (O-E)^2 = 72.46$

$X^2_C = 72.46 > X^2_{\alpha=0.05} = 7.185$ at 3 degrees of freedom and 95% level of confidence.

The calculated Chi-square value of 72.46 is greater than the critical value at 95 % level of confidence. The null hypothesis H_0 that there is no relationship between legislation and women involvement in forest conservation and management is rejected. Therefore we accept the alternative hypothesis that there is significant relationship between legislation and women involvement in forest conservation and management in Chepalungu Constituency of Bomet County.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION, RECOMMENDATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

5.1 Introduction

This chapter features a summary of key findings of the study, in addition to presenting conclusions on the basis of study findings. Besides, it also highlights recommendations, both for policy formulation and further research studies.

5.2 Summary of the Study Findings

In this study, the researcher administered 100 copies of questionnaire to the respondents upon which 95 were completed and received back giving 95% response rate which is classified a superior questionnaire response rate.

Demographic characteristics of the respondents were considered significant as these features generally predispose people to display certain unique behavior patterns in the performance of their duties in forest conservation and management. Such demographic features considered in the study include sex, age, marital status, level of education and religion. By age, 10.5% of the respondents fall in the age bracket of 18-25 years, 15.7 % are in 26-33 years, 15.7 % are in the age bracket of 34-41, 36.8 % are between 42-49 and 21 % are 50 years and above. By marital status, 52.6% are married, 15.7 % are single, 5% are divorced, 21% are widowed and 5 % make up other types of marital status. By gender, 31.5% are male and the other 68.5% are female. By education, 5.2 % have primary education, 47.2% have secondary education, 31.6 % have college education and another 15.8% have university education and above. By religion, 42.1% of the respondents are Roman Catholic, 42.1 % are Protestants, 10.5% profess traditional faiths and the remaining 5.3% belong to other minor religions.

5.3. Influence of culture in forest conservation and management

On whether culture influences in forest conservation and management, 73.7% said culture helps in forest conservation and management and 21% said that culture does not help. 68.3% said local culture limits the involvement of women in forest conservation and management and 21.1% said it does not limit women involvement. 63.2% said that culture influences the sharing of forest products while 31.5% said it does not. 62.1% reported that foreign culture does not help in forest conservation while 30.5% said it helps in forest conservation and management. 36.7% said that erosion of culture leads to deforestation and general environmental mismanagement while 52.8% agreed with the notion that erosion of culture leads to deforestation and general environmental mismanagement. 38.9% of the respondents said that local culture helps influence both the national and local forestry legislation while 52.6% do not believe that local culture helps influence both the national and local forestry legislation. It can be concluded that culture is a big impediment to the involvement of women in forest conservation and management because it is the culture that influences the sharing of forest products and the position that women can hold in the conservations and management groups because traditionally women are not suppose to rule over men. It is also culture that allocates domestic responsibilities to men and women in the society and this has a direct bearing on the resources that men and women get from the forest. Women will are more interested in getting firewood that is used for cooking and fruits that are used as food while the men get timber for building and posts and sticks for fencing. Local culture also does not have an influence on legislative matters governing the environment and the result is some laws made are insensitive to the culture of the people and do not help in conservation.

5.4 Influence of religion in forest conservation and management

68.5% of the respondents said that traditional religion helps in forest conservation and management while 21% said that it does not help. Traditional religion helps in forest conservation and management because local people use the forest for religious rite such as worshipping of local gods in isolated shrines for offering of special prayers and some trees are preserved for special uses. 92.6% said modern religion helps in forest conservation and management 7.8% said it does not help. Modern religion helps in forest conservation and management because there are some religious tenets that espouse the preservation of the environment.

Some religious practices such as fasting and offering of special prayers away from the people is done at the quietness of forests. 88.9% of the respondents said that religious leaders play a central role in forest conservation and management while 12.6% said they do not play a role in forest conservation and management.

Religious leaders are actively involved in forest conservation because they preach the conservation of environment as part of their religious duty. The holy books i.e. the Bible and the Quran teach about the value of clean environment and being responsible for the surrounding. Forests are also used for religious purposes such as conducting special prayers and fasting. There are also situations when Christians seclude themselves from the rest of the population to conduct very special prayers and forests are perfect places for such events. On whether local community uses the forest for religious purposes, 90.6% of the respondents agreed while 8.3% did not agree. The local community does use forests for religious purposes be they for traditional religions functions or for modern religious issues. The adherents of modern religion may use forests for prayers that may require them to be secluded from the rest of the population or to take time away to meditate on a serious spiritual issues. 42.2% of the respondents said that religious practices determines how forest products are shared while 36.7% said they do not. Religious practices of the local community influence how the forest products are shared because the people's religious practices are closely tied to the culture and how domestic duties at home are shared. Women are expected to take care of household chores such as cooking, washing and collecting firewood from the forests. Their main benefits from the forests are firewood; fruits and berries because they are the ones who feed the family; herbs and medicinal roots because they use them to not only treat their children but also the rest of the family including their spouses. Men, because they are suppose to build shelters, benefit from the timber; posts and sticks for fencing. 21% of the respondents said that religious leaders do play role in legislation of forest and environmental matters while 68.5% said they do not. This means that religious leaders are not consulted when making environmental laws.

5.5 Influence of technology in forest conservation and management

69.4% of the respondents said that modern technology plays a role in forest conservation and management while 23.2% said it does not. This shows that modern technology in the form of cell phones and internet influence the way information is collected and shared and easily made available to several people. Environmental destruction aspects are easily filmed or photographed and easily shared online making it known to the interested audience. 12.6% said that modern

technology is easily accessible to women who are involved in forest conservation and management while 69.4% said modern technology is not easily accessible to women who are involved in forest conservation and management. This shows that women are not equipped enough with this technology and therefore do not play any significant role in forest conservation and management. This could be caused by low levels of education and culture which do not allow women to play a major role in management. 63.1% of the respondents said that social media influences forest conservation and management while 31.6% said social media does not. The explanation is that phones that have Facebook and Twitter applications are readily available and when any environmental issue is highlighted in them, it gets picked up and widely shared. Social media can be used to drive any agenda that may be of interest to the majority population. 66.3% of the respondents said that levels of technology influence the rate of deforestation and general environmental mismanagement and 22.1% said that levels of technology do not influence the rate of deforestation and general environmental mismanagement. The levels of technology heavily correlates with the rates of deforestation i.e. the lower the levels of technology, the higher the rates of environmental destruction and the vice versa. This means that higher enlightenment levels reduces the rate of deforestation because many people know what is going on and is of interest to them and they will share their opposition to it. 63.2% said technology does not complement the local conservation methods in forestry conservation and management and 26.3% said that modern technology complements the role played by technology in conservation efforts. Therefore it is apparent that technology and local conservation efforts do not go hand in hand.

5.6 Influence of legislation in forest conservation and management

94.7% of the respondents said that Kenya has laws governing conservation and management and 4.2% said that Kenya does not have laws governing the forest conservation and management. This shows a high number of the population are aware of these laws and can quote some of them including the agency that is responsible for watching over forests and that charged with taking care of the environment. 87.4% of the respondents said that Kenyan laws are strong enough to stop illegal logging and environmental destruction while 4.2% said Kenyan laws are not robust enough to deter illegal logging and environmental destruction. This shows that majority of the respondents have faith in the efficacy of the Kenyan laws in fighting against actions that degrade the forests and the environment. 33.7 % of the respondents said that Kenyan and international laws and conventions give prominence to women in conservation and

management while 61% said that women are not given prominence by Kenyan laws and international conventions. The explanation is that these laws, women are not accorded enough chances and even if they are accorded the chance, these laws are rarely implemented and they remain good on paper but not in the implementation. Therefore it can be concluded that legislation is an obstacle to women in forest conservation and management. 70.6% of the respondents said that international laws and conventions do not play a role in forest conservation and management while 23.2% said that they play a role. The respondents reported that these conventions are very effective when they are on paper after ratification in the country but are rarely implemented which does not bring in the desired effect. 23.2% of the respondents said that laws governing forest conservation and management are understood by the local community while 68.4% said these laws are not understood by the women of local community. Therefore it can be concluded that ignorance of these laws do bar women from understanding their role in management and to effectively play a role in forest conservation.

5.7 Conclusions of the study

Based on the findings of the research, the following conclusions were made:

Culture is a factor that influences the participation of women in forest conservation and management. Culture determines the sharing of the forest products because the benefits derived by each gender form are dictated by it. Women culturally are supposed to cook for the families. As a result, they are the ones who harvest firewood for cooking; fruits and berries with which to supplement the family diet. Because they are the ones who are closer to the children and take care of the family health issues, they get medicinal herbs, roots, tubers and barks from various forest vegetation for treating their families. Men on the other hand, because of their expected duties of building houses and making fences in the compound, are the beneficiaries of timber, logs, posts and sticks with which to use for construction of structures and fencing. It is also culture that has a strong bearing of the sharing of responsibilities in the society and by extension the forest groups. Women in these forest groups are given few and less influential positions thereby limiting their contributions in the forest and environmental matters. On the other hand, men take majority of the positions including the very powerful ones and consequentially have an overwhelming say in matters of the forest and the general environment. It is also culture that has bearing of the sharing of professional opportunities. Among the Kenya Forest Services guards in Chepalungu constituency, more than eighty percent of them are men and the remainder is women. In addition, women rarely hold high ranking positions in this agency and when it comes

to patrolling of the forests, women are seldom given a chance to be part of it because they are assumed to be weak and cannot surmount the challenges of patrol job.

Religion has an influence in the participation of women in forest conservation and management. There is a thin line between the religious and cultural expectations of men and women in the society. Men religiously and culturally are expected to be the heads of the families and women are supposed to obey men in all aspects and this is true for both the modern and the traditional religions. This is clearly reflected when it comes to sharing of positions in the places of worship and even in the professional duties and responsibilities. Because women are expected to be custodians of the homes, they are discouraged from taking up positions that may remove them from their homes and that may explain a small number of women among the forest guards. Religion also arrogates roles to either gender where women are meant to be home keepers and men to do the hard outside duties. As a result, women are the ones who use the 'light' forest products such as firewood for cooking; fruits and berries for supplementing the family diet and medicinal herbs and leaves for treating ailments in the family in contrast to men who use the 'heavy' forest products such as logs for sale; timber for building and posts and sticks for fencing. In religious dispensation, women do not take up very powerful positions in places of worship and that explains why there are few women pastors and no women leaders in traditional religious rites because culture does not permit them. All they can do is perform very peripheral roles.

Technology has a big influence in the roles that women play a role in forest conservation and management. The levels of technology go hand in hand with the levels of education. Because culturally women are discriminated against in provision of education, they do not have the requisite skills with to manipulate sophisticated cell phones that have fairly advanced applications such as Facebook and Twitter. Women in the traditional setting are not supposed to own these cell phones and even when they own them, it is their husbands who keep for them most of the times and may regulate how their wives use them. This denies them the chance to use them in accessing or sharing environmental issues that are available over the net. Technology also has not yet well penetrated all spheres of the society. Internet and modern phones are not accessible to everybody because of prohibitive costs, lack of power for charging and low levels of education. Since women are not all equal in standing with men, it means technology least reaches women thereby limiting their contribution in forest conservation and management. Consequently, women will be locked out of very important happenings touching on the environment thereby reducing their participation.

Legislation limits the involvement of women in forest conservation and management. The national and local legislation do not expressly authorize or empower women to carry out conservation and management efforts. Some of these laws mention women as being very important components of conservation but the weakest link is the implementation of these laws. As a result, these good intentions of the legislation remain good on paper which will not benefit women in any way. Another weakness of these laws is that women are rarely consulted when making legislation that touches them. This means these laws are not sensitive to the needs of women from the beginning and may have serious knock on effects. Legislation also has a bearing on the punishment that is meted out on the offenders of environmental crimes such as illegal logging, charcoal burning and dumping of toxic substances in areas with sensitive ecosystems. Some of the forest guards are bribed by those who have committed serious environmental crimes such as being involved in massive charcoal burning and felling of trees for illegal lumbering. On the other hand, those who commit petty crimes such as collecting dry firewood are put in and heavily punished because they cannot raise a bribe. It is the women who do collection of firewood and because they are poor, they are put in by the guards while the more financially capable who commit more serious forest crimes are let off the hook. This therefore shows the legislation becomes a stimulant to forest destruction rather than being a deterrent.

5.8 Recommendations of the study

The following recommendations were made based on the study:

There is an urgent need to ensure that the number of women in environmental and conservation positions is increased so as to ensure their participation is felt and taken seriously. It is not just enough to put women in leadership but it should be in positions that are able to influence policy and push their feminine agenda. This calls for the review of the selection criteria in such a way it favours women. The mode of choosing forest group officials should be made in such manner that women get preferential treatment because of the many obstacles on their way.

The Kenyan 2010 constitution calls for the strict adherence of the two-thirds rule in employment opportunities where no one gender should exceed two thirds of the employment positions. The study discovered that the male KFS guards in Chepalungu constituency make up more than two thirds of the total guards force. This means that women do not stand a chance to serve in senior positions that come through promotions. Therefore, women should be encouraged to participate in the recruitment exercises and be given preferential treatment so as to motivate them otherwise

the number of women will gradually decline despite the constitution giving them that minimum guarantee. Discriminative conditions such as not being pregnant or being underweight during the recruitment exercise should be scrapped because it is only the women that are heavily affected by such requirements.

The local population especially women should be sensitized on the legislation governing the forest and the general environment. One factor that reduces the participation of women is ignorance on what environmental laws are. This is attributable to low levels of education among the women. This call for concerted efforts to be made right from the nursery schools to the higher levels and the result will be higher education among the women. This will translate to better understanding of legislation that holds a big sway in environmental conservation and forest management. Religious leaders should be encouraged to come up with teachings that are favourable to women. The hard line interpretation of the holy books should be softened such that women get to hold senior positions in religious leadership and stand a chance to influence policy legislation in the country. This does not mean that the crux of the teachings of these religions should be structurally altered.

5.9 Recommendations for policy issues

The Kenya Forestry Service (KFS) should be given an enhanced mandate of not only arresting those who carry out illegal logging and charcoal burning but also to prosecute them. The weakness with the present system is that the offenders are arrested and handed over to the police who due being compromised by these offenders may forward sloppy cases that end up being throw out the courts leading to the freeing of the culprits.

NEMA should also have an expanded mandate that will make it robustly deal with environmental issues. The work of NEMA as of now is to recommend to the law enforcement authorities how the environmental polluters should be dealt with. NEMA itself should not only apprehend the offenders but also be the ones to prosecute cases in court. This therefore calls for radical change in police laws to take away that t role from the police force.

The making of environmental laws should be extensive and inclusive which is contrary to how it is now. The current trend where MPs present laws to the parliament without sufficient input of the people on the ground is not tenable because it results in the legislation that is not sensitive to the needs of the and especially women who are highly discriminated against by many sectors of

the society. Women should be given a priority in public participation so as to present their views which may radicalize the way things are done.

Finally, the Kenyan 2010 Constitution should be enforced when it comes to employment opportunities because this is the only hope for equality between men and women. Discriminative requirements such as weight, height, marital status and being pregnant or not by women when they are being recruited to the Kenya Forestry Service guards should be abolished. This will boost the participation of women in positions of conservation of the environment and forestry matters.

5.9 Suggestions for further research

Further research is recommended on the following:

Technology is a biggest hindrance to women participation in forest conservation and management. Further research should be carried out on the specific aspects of technology that bar women from being active participants in conservation and management. In addition, culture is another factor that hinders women from meaningfully taking part in forest management. Further research should be done on the specificity and the scope of those cultural factors that prevent women from actively participating in forest conservation and management.

Furthermore, religion is a hindering factor in forest conservation and management. Further research is needed to ascertain the scope on how religion limits rather than motivate women in forest conservation and management. Finally, further research is needed to establish the actual aspects of legislation that prevent women from taking part in forest conservation and management with the intention of repealing or amending them. Progressive legislation should be the result of the repealing or amendment of the present legislation and should give equal opportunities to both genders.

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APPENDIX I: LETTER OF TRANSMITTAL

ST.MICHAEL'S SEC.SCHOOL,
P.O. BOX 11,
BOMET.

30TH SEPTEMBER, 2015.

THE DIRECTOR OF FORESTRY,
CHEPALUNGU CONSTITUENCY,
P.O. BOX
SIONGIROI.

Dear Sir/Madam,

RE: REQUEST FOR PERMISSION FOR DATA RESEARCH COLLECTION.

I am a student undertaking Masters of Arts in Project Planning and Management at the University of Nairobi. As part of my studies, I am required to submit research project. Consequently, I have written a proposal titled "Factors influencing the involvement of women in the conservation and management of forests in Chepalungu Constituency of Bomet County".

As result, I have designed a questionnaire that will enable me to collect data. The community users of forest resources who live adjacent to the forest will be my respondents. I am therefore seeking for authorization to collect data from these groups. The information obtained will be treated with utmost confidentiality and for education purposes only.

Your assistance on this matter is highly appreciated.

Thank you.

Yours faithfully,

HILLARY KIPRONO RUTO.

APPENDIX II: RESPONDENT'S QUESTIONNAIRE

I am a student taking Masters of Arts (Project Planning and Management) at the University of Nairobi. At present I am doing a research on “Factors influencing the involvement of women in forest conservation and management in Chepalungu constituency, Bomet County”.

You have been identified as one of the respondents in this study. The information that you will provide will be treated with confidence and respect. The results obtained are expected to enhance the participation of women in forest conservation and management in Chepalungu Constituency.

Kindly fill in the questionnaire to the best of ability and honesty. Your support and co-operation is very important and will be highly appreciated.

Thank you.

SECTION A:

Demographic characteristics

i) Name (optional).....

ii) Age: (Tick one) (a) 18-25 years (b) 26-33 years

(c) 34-41 years (d) 42-49 years

(d) 50 years and above

iii) Highest level of education attained:

a) Primary b) Secondary

b) College d) University and above

iv) Marital status: a) Single b) Married c) Divorced d) Widowed e) Others

v) What is your role in management of forests?

(a) Divisional Forest Officer (b) District Forest Officer (c) Executive Committee (d) Forest guard

vi) Gender: a) Male b) Female

SECTION B:

Please read the given statement and give your opinion by ticking (✓) in the appropriate column:

KEY: SA-Strongly Agree, A-Agree, D-Disagree, SD-Strongly Disagree.

1. Influence of culture on women involvement forest conservation and management

SN	STATEMENT	SA	A	D	SD
	In forest conservation and management				
i.	Local culture helps in forest conservation and management				
ii.	Local culture limits women in forest conservation and management				
iii.	Culture influences the sharing of forest products				
iv.	Foreign culture does not help in forest conservation and management				
v.	Erosion of culture leads to deforestation and mismanagement of the environment				
vi.	Local culture influences the national and local legislation on forest conservation and management				

2. Influence of religion on women forest conservation and management

SN	STATEMENT	SA	A	D	SD
	In forest conservation and management				
i.	Traditional religion helps in forest conservation and management				
ii.	Modern religion helps in forest conservation and management				
iii.	Religious leaders play a central role in forest conservation and management				
iv.	Local community uses the forest for religious rites				
v.	Religious practices of the local community determines how forest products are shared				
vi.	Religious leaders play a role in legislation of local legislation in forest conservation and management.				

3. Influence of technology on women forest conservation and management

SN	STATEMENT	SA	A	D	SD
	In forest conservation and management				
i.	Modern technology plays a role in forest conservation and management				
ii.	Modern technology is easily accessible to women who are involved in forest conservation and management				
iii.	Social media such as Facebook and Twitter influences forest conservation and management				
iv.	Levels of technology influence the rate of deforestation and environmental mismanagement				
v.	Modern technology complements the role played by local forestry practices in forest conservation and management				

4. Influence of legislation on women forest conservation and management

SN	STATEMENT	SA	A	D	SD
	In forest conservation and management				
i.	Kenya has laws governing forest conservation and management				
ii.	Kenyan laws are strong enough to stop illegal logging and environmental pollution				
iii.	Both Kenyan and international laws give prominence to women in forest conservation and management				
iv.	International laws and conventions play a role in forest conservation and management				
v.	Laws on forest management and conservation are understood by the local community				

5. Give suggestions on what can be done to improve the participation of women in forest conservation and management.

- (i).....
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- (ii).....
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- (iii).....
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- (iv).....
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(v).....
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(vi).....
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