GENDER RELATIONS IN FOREST GOVERNANCE AND USE OF FOREST RESOURCES WITHIN CHERANGANY HILLS FOREST, KENYA

BY

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DECLARATION

Declaration by Student

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I would like to dedicate this thesis to my wife Judy, my sons Ethan and Adriel, as well as my parents Daniel and Melisa for their moral support, financial assistance and prayers during the writing of this thesis. God bless you.

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ABSTRACT

Existing studies demonstrate that men and women from forest adjacent communities not only collaborate with other stakeholders in forest governance but also have roles, decision making powers and rights over the use of forest resources. However, there is scanty information about power relations between spouses engaging in forest governance and use of forest resources within state-managed forests in Kenya. To bridge this knowledge gap, this study assessed intra-household gender relations in forest governance and use of forest resources within Cherangany Hills Forest, Kenya. The specific objectives were to: assess the nature and extent of involvement of husbands and wives in Community Forest Association (CFA) activities; analyze the decision making powers, roles and rights of husbands and wives over the use of forest resources; examine the implication of involvement of husbands and wives in CFA activities on livelihoods; and assess the constraints and opportunities for husbands and wives engaging in CFA activities. This study was guided by the 'Typology of Participation' model, Theory of Feminist Political Ecology, and the 'Gender-Box' theoretical framework. Drawing upon the premises of the post-positivist research philosophy and mixed-method research approach, a concurrent triangulation research design was adopted. A household sample size of 280 (140 male and 140 female) CFA members was randomly selected and 35 key respondents (20 CFA members, 7 CFA leaders, 2 village elders, 2 assistant chiefs, 2 forest guards and 2 forest officers) were purposively sampled. Primary data was collected by administering semi-structured questionnaires and conducting key informant interviews. The mean and standard deviation were used to analyze quantitative data and presented as frequencies, percentages, tables and graphs while qualitative data was analyzed thematically and presented as synthesized text. It was revealed that both husbands and wives engaged substantially in forest governance through payment of CFA subscription fees, attendance of CFA meetings, reforestation and forest protection. It was confirmed that husbands and wives shared decision making powers, roles and rights to a great extent during crop farming as well as grazing of the livestock within the forest. The engagement of both male and female spouses in CFA activities contributed substantially to food access, livestock feeds and herbal medicine. Time constraints significantly restricted both husbands and wives from attending CFA meetings and seeking CFA leadership posts while gender norms of behaviour discouraged them from using forest resources. This study concludes that there was substantial collaborative gender relation between husbands and wives during payment of CFA fees, attendance of CFA meetings, engagement in reforestation and forest protection as well as decision making over use of forest land for crop farming and source of livestock feeds. Forest policy makers, practitioners and researchers should apply other research philosophical paradigms, theoretical models and research approaches to examine the implications of intra-household gender relations in forest governance and use of forest resources on livelihoods in other geographical areas.

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ABBREVIATIONS

CAMPFIRE	Community Areas Management Programme For Indigenous Resources
CBO	Community Based Organization
CFA	Community Forest Association
COVID	Corona Virus
DRC	DRC
FPE	Feminist Political Ecology
GoK	Government of Kenya
Ha	Hectares
KFS	Kenya Forest Service
Km^2	Square kilometres
M	Metres
MM	Millimetres
NACOSTI	National Commission for Science, Technology and Innovation
NGO	Non-Governmental Organization
PELIS	Plantation Establishment and Livelihood Improvement Scheme
PFM	Participatory Forest Management
PhD	Doctor of Philosophy
REDD+	Reduce Emissions from Deforestation and Forest Degradation
SDG	Sustainable Development Goal
SPSS	Statistical Package for Social Sciences

OPERATIONAL DEFINITION OF SIGNIFICANT TERMS

Forest actors/ stakeholders: In this study, they include Kenya Forest Service, County Government, Ministry of Environment and Forestry, public administrators, Community Forest Association, and Non-governmental Organizations.

Forest governance: In the present study, it refers to the involvement in CFA activities such as payment of CFA fees, attendance of CFA meetings, consultation with CFA leaders, reforestation programmes, forest protection, and decision making in relation to CFA activities.

Forest knowledge: In the current research, it includes both modern and traditional information, technologies, skills, practices and beliefs that guide the protection, management, conservation and use of forest resources.

Gender: In this study, it refers the differences between husbands and wives in relation to their roles in the protection, rehabilitation, management, conservation and use of forest resources.

Gender relations: In the current study, it encompasses the power relations between husbands and wives of CFA members during decision making powers and performance of CFA roles and use of forest resources. In this study, two gender relations were examined: (a) collaborative gender relations/ balanced gender relations and (b) unequal/unbalanced gender relations were examined.

Livelihoods: In this research, it refers to the household's ability gain access to forest benefits such as food, livestock feeds, medicine, firewood, income and environmental benefits.

Non-timber forest resources: In the present study, it includes forest products such as crops grown within the forest, livestock pasture, herbal plants, honey, indigenous vegetables and wild fruits.

Participatory Forest Management: In this thesis, it refers to the mode of forest governance where forest adjacent communities in collaboration with forest management authorities and other forest actors engage in the protection, rehabilitation, management, conservation, and use of forest resources.

Plantation Establishment and Livelihood Improvement Scheme (PELIS): In the current study, it refers to the programme where CFA members are permitted to grow crops on allocated plots as they take care of the planted tree seedlings within the deforested sections of the forest.

Royalty fee/ Permit fee: In the present research, it includes the stipulated amount of money paid to the Kenya Forest Service to gain rights over some parts of forest land, firewood, herbal plants, and hanging bee-hives.

Use/ exploitation/harvesting of forest resources: In this study, it refers to the use of forest land for crop farming, livestock grazing and hanging of bee-hives as well as collection of livestock pasture, dead wood, vegetables, and fruits.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Gender is one of the significant socio-demographic factors that not only shape identity and responsibilities but also decision making over the protection, management, conservation and use of natural resources (Onzere *et al.*, 2020; Rocheleau, 1995; Rocheleau *et al.*, 1996). The involvement of men and women in forest governance is critical for the achievement of sustainable use of forest resources. This is supported by the argument that men and women possess diverse indigenous ecological knowledge, varied attitudes towards the environment and unique abilities to persuade other community members to engage in forest conservational initiatives (Abate, 2020; Hosseinnezhad, 2017). Further, the inclusion of rural men and women in forest conservation groups increases the 'pool' of citizens monitoring forests against illegal forest users, enhances transfer of information about forest use rules and conservation programmes, promotes inculcation of conservation values to the future generations, curbs adverse forest conflicts and enhances forest regeneration (Abate, 2020; Agarwal, 2009b; Coleman & Mwangi, 2013; Giri, 2009).

Within the developing economies, some men and women from forest adjacent communities are members of not only forest user groups but also active participants in forest protection and conservation organizations (Awono *et al.*, 2010; Egunyu & Reed, 2015; Ngono & Munongo, 2014). Moreover, some of the male and female members of forest based organizations attended forest based meetings while others spoke during these forest meetings (Evans *et al.*, 2020; Rout, 2018; Samndong & Kjosavik, 2017; Sanjay, 2017; Tuijnman *et al.*, 2020). Further, some male and

female members of forest protection organizations engaged not only in the formulation of forest rules but also in forest patrols, reporting of illegal forest users, apprehension of forest intruders, and control of forest fires (Bitange *et al.*, 2021; Killian & Hyle, 2020). In addition, men and women from forest adjacent communities who are members of forest based organizations participated in the reforestation activities (Bitange *et al*., 2021; Kalanzi *et al.*, 2020; Rukundo, 2018). Although both male and female leaders of forest based organizations were involved in decision making over forest issues, men have continuously dominated the decision making over the forest governance issues (Kalanzi *et al.*, 2020; Killian & Hyle, 2020).

With regard to gendered rights over the use of natural resources within the state-owned forests, men and women belonging to forest user organizations gain access to forest land under the modern *Taungya* model where they cultivate crops within the state-managed forests (Kalanzi *et al*., 2020; Manginsela, 2016). Both men and women have usufruct rights over wild fruits and vegetables located within forested areas (Kalanzi *et al*., 2020; Manginsela, 2016; Rotich, 2019). Although both men and women had access to dead wood from state-protected forests, women dominated the collection of this fuel wood because this activity is regarded ‘feminine’ (Fortnam *et al*., 2019; Sithole *et al.*, 2021). In addition, both men and women had access and control over medicinal plants growing in the forest which is used to extract herbal medicine to cater for health needs (Kalanzi *et al*., 2020; Manginsela, 2016). Men dominated the practice of bee keeping within state owned forests not only because they had the indigenous knowledge about bee-hive making and harvesting of honey but also due to socio-cultural norms (Kiprop *et al*., 2017; Mutune & Lund, 2016).

Some members of forest user groups gained the rights to collect forest products for household's need as well as utilized the money obtained from the sale of forest products to promote their well-being and that of their households (Giri, 2009; Ongugo *et al.,* 2017). The crops cultivated as well as vegetables and fruits gathered from the forest are sources of food for the household (Kalanzi *et al*. 2020). Some members of communities residing near state-owned forests collected livestock fodder and had rights to graze livestock within the glades (open spaces) in the state-owned forests during the dry season (Mbuvi, 2018; Rotich, 2019; Thygesen *et al.,* 2016).

Further, some of the food crops harvested from the forest, firewood collected, honey harvested and vegetables gathered from the forest are sold at the village markets earning money which is used to purchase household items (Rotich, 2019). Other forest resources such as herbal plants have medicinal value while honey harvested from the bee-hives hanged in the forest is used as food additive (Kiprop *et al*., 2017). Moreover, the leaders of community forest organizations received stipend for their duties while other members earned income through provision of labour services during the establishment of tree nurseries and cultivation of crops within the forest (Kenya Forest service, 2015).

Although men and women played vital roles in forest governance, there are several constraints that have curtailed their involvement in community based forest management. Time constraints associated with the performance of domestic chores largely by women as well as livelihood activities mainly by men limited the time available to attend forest related meetings, take up leadership roles, engage in forest patrols, and participate in forest rehabilitation programmes (Mashapa *et al.,* 2020;

Onzere *et al*., 2020; Soliku, 2021). Due to financial constraints, some men and women were unable to pay the membership and subscription fees of Community Based Forest Organizations as well as engage in forest rehabilitation programmes (Samndong & Kjosavik, 2017). At the organizational level, the mismanagement of financial resources by the leaders of community based forest organizations discouraged men and women from participating in forest governance (Mbise *et al*., 2021; Okumu, 2017).

Further, inadequate training and sensitization of forest organizational members about the operations of the forest organizations as well as inadequate information about the venue and time of forest meetings hindered the involvement of men and women in forest governance within developing nations (Killian & Hyle, 2020; Kimutai & Watanabe, 2016; Mutune *et al.,* 2015). Due to distance limitations, some members of forest management organizations were unable to attend forest meetings, patrol the forest, and plant trees within the forest (Banana *et al.,* 2012). In addition, socio-cultural norms hindered the active involvement of women during forest meetings, planting of trees and decision making over forest governance issues (Killian & Hyle, 2020; Mashapa *et al.,* 2020; Ndungo *et al.,* 2013; Ongugo *et al.,* 2017; Rocheleau & Edmund, 1997). It is based on the above background that this study examines intra-household gender relations in forest governance and use of forest resources on livelihoods.

1.2 Statement of the Problem

Through participation in community based forest management institutions, men and women are able to voice their concerns during forest meetings, bargain for access to forest resources, engage in decision-making, and minimize socio-cultural restrictions

on access to forest resources (Abate, 2020; Giri, 2009). However, existing literature from Kenya and Cherangany Hills Forest postulates that the female CFA members and leaders had little or no say during forest meetings and were less involved in decision making on the conservation of the forests (Ndungo *et al.,* 2013; Ongugo *et al.,* 2017). This is attributed to the fact that male CFA leaders and members dominated decision making over the management and use of forest resources not only in Kenya but also within Cherangany Hills Forest. Subsequently, this marginalization of women in decision making over forest governance activities may reduce the possibilities of achieving 10 % forest cover in the Kenya by 2022 in order to minimize carbon emissions and reduce the rate of climate change (GoK, 2016; Ministry of Environment & Forestry, 2019).

Despite these gendered socio-cultural norms and marginalization, both men and women continue to engage in the CFA activities in Kenya (Bitange *et al.,* 2021) as well as within the Cherangany Hills Forest in Kenya (Ongugo *et al.,* 2017). But, the existing discourse on gender involvement in forest management have inadequately assessed the extent to which spouses who are CFA members engage in forest governance in Kenya. Therefore, the following questions remain unanswered: what is the nature and extent of involvement of husbands and wives in Community Forest Association activities? Are the husbands and wives of the CFA members likely to continue engaging in forest governance in future and what are the motivating factors? If yes, what is the contribution of the gendered involvement in forest governance on livelihoods?

Under the Participatory Forest Management model in Kenya, the forest adjacent communities are only permitted to exploit non-timber forest resources (Kimutai &

Watanabe, 2016). Further, previous studies from Kenya argue that men dominated the harvesting and use of timber forest products while women engaged mainly in the collection of non-timber forest products such as medicine, vegetables and wild fruits for domestic consumption (Bitange *et al.*, 2021; Obonyo & Mogoi, 2009; Ongugo *et al.*, 2017; Ndungo *et al*., 2013). This unequal gendered access and use of forest resources has negative implications on the livelihoods of not only the women but also other household members.

Although, documented evidence from developing economies demonstrates that men and women shared decision making powers and roles with regard to cultivation of crops and harvesting of pasture in Indonesia (Manginsela, 2016), there is scanty information about intra-household gendered decision making powers, roles and rights over the use of non-timber forest resources within state-managed forests in Kenya and Cherangany Hills Forest. Therefore, the questions that remain unaddressed are: 'Do husbands and wives make joint decisions over the use and sale of non-timber forest resources within Cherangany Hills Forest? If yes, do husbands and wives share the responsibilities and rights over the use of non-timber forest resources equally? Are these men and women intending to continue with use of non-timber forest resources and what are the motivating factors? If yes, what is the implication of gendered access to and use of forest resources on the livelihoods?

A growing body of knowledge demonstrate that forest adjacent communities are restricted from engaging effectively in forest governance activities in Kenya and within the Cherangany Hills Forest ecosystem by unequal intra-household gender relations, time constraints, financial challenges, distance factors, inadequate knowledge and training, and gender norms of behaviour (Kimutai & Watanabe,

2016; Okumu, 2017; Ongugo *et al.,* 2017). Further, it has been demonstrated that these challenges were likely to hinder women more than men in their engagement in forest governance activities (Larson *et al.,* 2015; Obonyo & Mogoi, 2009). It is therefore plausible that these challenges that hinder women and to some extent men whose livelihoods depend on forest resources are likely to encounter food insecurity and poverty at both individual and household levels. Existing studies have insufficiently assessed the extent to which these challenges hindered the involvement of husbands and wives from engaging in forest management and use of non-timber forest resources. Therefore, some research questions remain unaddressed: Do the constraints operating at micro-scale, meso-scale and macro-scale hamper the engagement of husbands and wives to the same extent? If yes, do the husbands and wives address these challenges in the same way?

1.3 Objectives of the study

1.3.1 General objective

The main objective of this study was to assess intra-household gender relations in forest governance and use of forest resources within Cherangany Hills Forest, Kenya.

1.3.2 Specific objectives

The specific objectives of this study were as follows:

1. To analyze the nature and extent of involvement of husbands and wives in Community Forest Association activities within Cherangany Hills Forest;
2. To assess the decision making powers, roles and rights of husbands and wives over use of forest resources within Cherangany Hills Forest;

3. To examine the implication of involvement of husbands and wives in Community Forest Association activities and use of forest resources on livelihoods within Cherangany Hills Forest;
4. To assess the constraints and opportunities for husbands and wives engaging in Community Forest Association activities and use of forest resources within Cherangany Hills Forest.

1.4 Research Questions of the Study

1. Do husbands and wives engage in Community Forest Association activities to same extent within Cherangany Hills Forest, Kenya?
2. Do husbands and wives share decision making powers, roles and rights over the use of forest resources within Cherangany Hills Forest?
3. What is the implication of the involvement of husbands and wives in Community Forest Association activities and use of forest resources on livelihoods within Cherangany Hills Forest?
4. Do husbands and wives engaging in Community Forest Association activities and use of forest resources experience same challenges and have same opportunities within Cherangany Hills Forest?

1.5 Significance of the Study

The findings of this study are important to forest policy makers, forest management institutions, forest adjacent communities, and future researchers as explained below: First, the results of this study are critical in the formulation and implementation of strategies that are geared towards achievement of the United Nations' Sustainable Development Goals (SDG) number five (5) and number fifteen (15) by 2030. The SDG number 5 aims at achieving gender equality and empowerment of all women

and girls while SDG number 15 advocates for the ‘protection, rehabilitation and sustainable use of land ecosystems, management of forests, combating desertification, reversing land degradation as well as halting biodiversity loss (United Nations, 2018). Also, the social and political pillars of the Kenya Vision 2030 highlight the issues of environment, gender, governance and rule of law, and decentralization as a strategy to poverty reduction (Government of Kenya, 2008). Therefore, the results of the current study on the implication of gender relations in forest governance and use of forest resources are essential in informing the Ministry of Environment and Forestry on formulating policies and implementing forest programmes that would enhance gender equity in management, conservation and use of forest resources to achieve the UN Sustainable Development Goals and Kenya Vision 2030.

Second, the findings of this research are imperative to the forest management stakeholders such as Kenya Forest Service, community based forest management institutions and international Non-Governmental Organizations. The current study presents detailed information on the extent to which husbands and wives engage in forest governance as well as the challenges that hinder their involvement in forest governance and the opportunities available to minimize these challenges. It is also clear that the interactions between forest actors play a pivotal role in promoting the involvement of forest fringe communities in forest governance. Drawing upon these findings, the forest management institutions both at national and local levels would initiate practices that promote active participation of men and women in sustainable forest management, use and conservation.

Third, the result of the present study is useful to the forest adjacent communities. This study provides critical information about the involvement of husbands and wives in decision making over the use of forest resources and sharing of forest benefits at the household level. Further, comprehensive information about the challenges and opportunities for husbands and wives engaging in forest governance has been presented. This detailed information is critical in promoting the engagement of men and women in forest governance and sustainable use of forest resources.

Finally, this study is significant to future feminist political ecologists and geographers. This study contributes to a growing body of knowledge on gender issues in forest governance and use of forest resources in developing countries. This study addressed some of the previously unexamined research questions on the intra-household gender relations in the protection, management, conservation and use of forest resources in Cherangany Hills. Therefore, the suggested areas for further research would lay the academic foundation on which feminist political ecologists and geographers would conduct research in future.

1.6 Scope and Limitations of the Study

This study was mainly anchored on the themes of feminist political ecology and feminist political geography. Feminist political ecologists aim to understand the gender differences and intra-household power dynamics in the protection, management, conservation and use to natural resources. On the other hand, the feminist political geographers strive to account for the gender variations in the level of access to and use of forest resources across space and over time. This research mainly focused on the intra-household gender relations in forest governance (CFA activities) and use of forest resources within two locations (Kapterit and Kapcherop) in Sengwer Ward that is adjacent to the Kiptaberr Forest Block of Cherangany Hills

Forest. Specifically, this study focused on the extent to which husbands and wives engaged in forest governance through their membership in CFA, payment of CFA fees, attendance of CFA meetings, consultation during CFA meetings, forest protection, reforestation activities, and continuity with involvement in forest management activities. Moreover, this study dealt with intra-household gendered decision making powers, roles and rights over the use of forest resources. Also, this study examined the challenges and opportunities operating at micro-scale, meso-scale and macro-scale levels for the husbands and wives engaging in forest governance (CFA activities) and use of forest resources.

With regard to limitations of this study, the data collection was limited by various challenges. First, language barrier was a challenge especially among some of the elderly respondents during data collection. This constraint was minimized by recruiting and training four research assistants (two female and two male) who understood the local dialect and were familiar with the study area and were essential in translation during interviews and filling of questionnaires. Second, the data collection was to commence in December 2019, but due to torrential rainfall that was associated with the landslides within the Cherangany Hills Forest the researcher postponed the data gathering to March 2020. However, in March 2020 due to the Corona Virus (COVID) 19 pandemic which was characterized by restrictions on movement and social distancing the data collection was carried out between October 2020 and March 2021 after relaxation on some of the COVID protocols. Moreover, during data collection, taking of photographs showing both men and women engaging in the forest governance was difficult because a majority of the respondents were mainly located some distance from the forest boundary and restricted movement into the forest.

1.7 The Study Area

1.7.1 Justification for the study area and study sites

The Cherangany Hills Forest was a suitable study area due to the various reasons. First, Cherangany Hills Forest is one of the five major water towers in Kenya (others are Mt Elgon Forest, Mt Kenya Forest, Aberdare Forest and Mau Forest) that is facing high rate of deforestation (Rotich & Ojwang, 2021). According to Rotich & Ojwang (2021) about 13,782 hectares of the forest cover within the Cherangany Hills Ecosystem was lost between 1985 and 2020 mainly due to human encroachment. Second, there are nine (9) CFAs and about ninety (90) Community Based Organizations within Cherangany Hills Ecosystem whose members engage in the protection, management and conservation of forest resources (Kagombe *et al.,* 2015).

With regard to selection of the Kiptaber Forest block, recent studies carried out within the western blocks of the Cherangany Hills Forest have largely concentrated within the Kapolet forest block in Trans Nzoia County and Kapkanyar forest block in West Pokot County (Rotich *et al.,* 2020; Rotich, 2019) as well as in Kipkunurr Forest Block, Chemurokoi Forest Block, Toropket Forest Block and Koisungur Forest Block in Elgeyo Marakwet (Langat *et al.,* 2021), thus ignoring the Kiptaberr Forest Block. According to existing literature, most of the natural vegetation within the Kiptaber Forest Block is still intact (County Government of Elgeyo Marakwet Integrated Plan, 2013). Therefore, there is need to establish the role of adjacent communities in the management, conservation and use of forest resources within the Kiptaber Forest Reserve.

Sengwer Ward was selected in this study because this area is adjacent to the Kiptaberr Forest Block and this administrative area has both indigenous and migrant

communities who engaged in the forest governance. Also, two locations (Kapterit and Kapcherop) were purposively selected because there was a forest guard post (Kipsambach Forest guard post) within Kipsambach sub-location in Kapterit Location and a forest station (Cherangany Forest Station) within Kapcherop Location. These two forest management centres indicates that the Kenya Forest Service officers and forest guards monitored the engagement of CFA members in the governance of forest resources as well as enhanced collaboration between the CFA members and other key actors in forest governance. During the reconnaissance, it was established that there was substantial involvement of CFA members within Kapcherop location (especially within Kipsero, Chebai and Yatoi sub-locations) as well as in Kapterit Location (within Kipsambach and Kapterit Sub-locations) in forest management activities such as forest patrols as well as use of forest land for crop farming under the Plantation Establishment for Livelihood Scheme (PELIS).

1.7.2 Cherangany Hills Forest

The Cherangany Hills Ecosystem transcends the counties of Trans Nzoia, Elgeyo Marakwet and West Pokot within the Rift Valley Region (Kenya Water Towers Agency, 2019). It is located within latitude $1^{0}16^{1}$ North of the equator and longitude 35^{0} 26^{1} East of Greenwich meridian. According to the Kenya Water Towers Agency (2019) the gazetted forest covers about 120,841 hectares (ha) of land which is geographically distributed as follows in terms of percentage: sixty seven percent (67 %) in Elgeyo-Marakwet County, thirty one percent (31 %) in West Pokot County, and two percent (2 %) in Trans Nzoia County.

The Cherangany Hills Forest is divided into two: Western block and Eastern Block. The western forest block occupy approximately 20,000 Ha and it consists of Kapolet

Forest block in Trans Nzoia County, Kapkanyar forest block in West Pokot County and Kiptaberr forest block in Elgeyo-Marakwet County (Kagombe *et al*., 2015; Kenya Water Towers Agency, 2019). On the other hand, the Eastern blocks cover a total of about 90,000 ha and they include Lelan forest block in West Pokot County as well as Embobut, Kerrer, Koisungur, Toropket, Chemurokoi, Kipkunurr, Cheboit, Sogotio and Kapchemutwa forest blocks in Elgeyo-Marakwet County as indicated in Figure 1.1 below (County Government of Elgeyo Marakwet Integrated Plan, 2013; Kagombe *et al*., 2015).

The Cherangany Hills Forest Ecosystem can be described as an old fault-block formation of non-volcanic origin with an undulating upland plateau on the western edge of the Rift Valley (Kagombe *et al*., 2015). To the east, the Elgeyo Escarpment drops abruptly to the floor of the Kerio Valley while westwards the land falls gently to the plains of Trans-Nzoia County. The altitude of the ecosystem ranges from 2000 metres to 3500 metres above the sea level with some peaks such as Kameleogon (3581 metres), Chebon (3375 metres), Cheptoket (3370 metres), Karelachgelat (3350 metres) and Sodang (3211 metres) (Government of Kenya, 1980; Kagombe *et al*., 2015; Kenrick, 2014; Kenya Water Towers Agency, 2019).

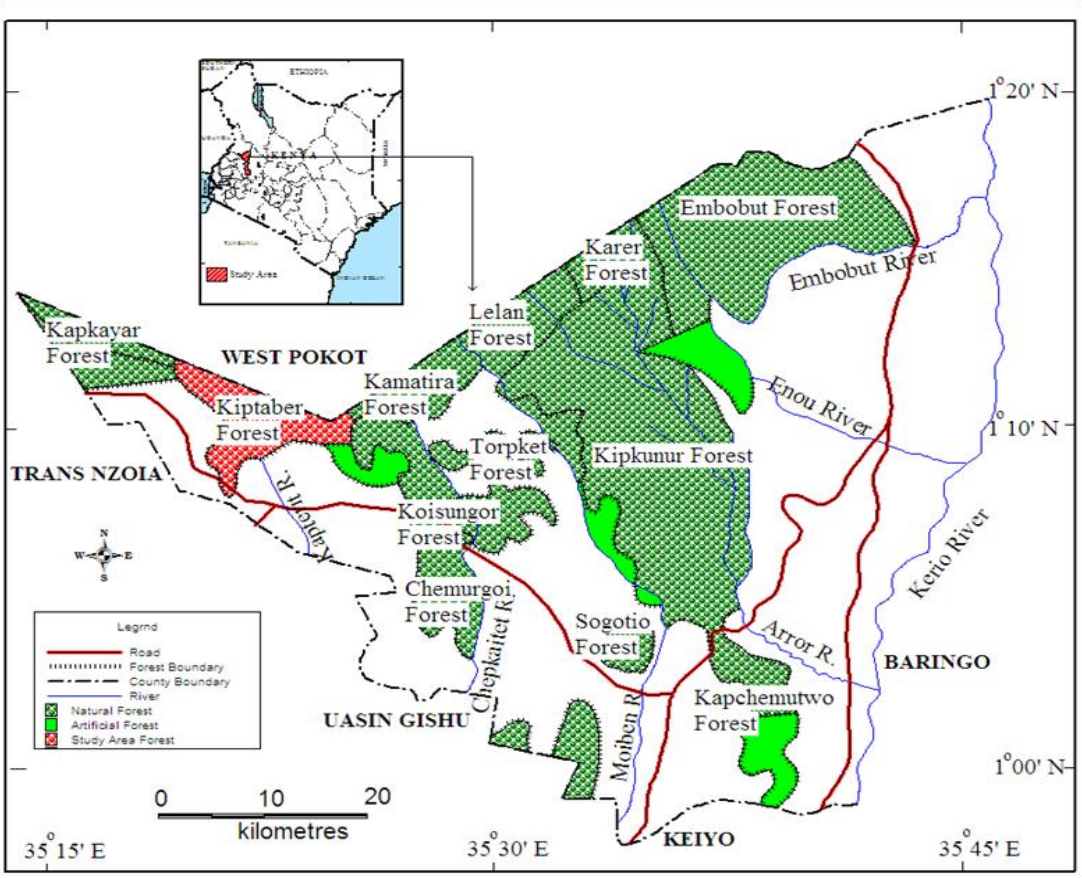

Figure 1.1: Map showing the location of Kiptaber Forest Block
Source: Moi University Department of Geography and Environmental Studies GIS Lab

The hills are composed of metamorphic rocks, with conspicuous quartzite ridges and occasional veins of marble (Kagombe *et al*., 2015). The whole area is occupied by Precambrian rocks of the basement systems and consists of gneisses and schists. The Cherangany Hills is covered by moderately deep soils of good structure and high organic matter content and variable acidity (Kagombe *et al*., 2015). The north-western and northern parts of the forest have deep to shallow soils which are in general, liable to sheet erosion (Kagombe *et al*., 2015).

With regard to temperature, the lowest temperature is 14^0 Celsius which is experienced during the month of July while the highest temperature is 24^0 Celsius which is recorded during the month of January (Kenya Water Towers Agency, 2019). The annual rainfall within the ecosystem varies from about 1200 mm in the

east to about 1500 mm in the west and this is influenced by the prevailing moist winds from Lake Victoria (Government of Kenya, 1980; Kagombe *et al*., 2015). Moreover, the average annual rainfall varies from 800 mm in the northern part to about 1,400 mm in the central part (Kagombe *et al*., 2015). The main rainy season is from March to September and maximum rainfall is recorded in the months of May and August (Government of Kenya, 1980) while the dry season extends from December to February (Kagombe *et al*., 2015).

The streams flowing to the west of the Cherangany Hills feed the Nzoia river system which flows into Lake Victoria while the streams to the east of the watershed flow into the Kerio river and Turkwel (Suam) river that drains into Lake Turkana (Kagombe *et al*., 2015; Kenya Water Towers Agency, 2019). Approximately 60,500 Ha of the forest is a closed-canopy while the remainder is comprised of bamboo, scrub, rock, grassland, moorland or heath, with about 4000 Ha of cultivation and plantations (Kagombe *et al*., 2015).

The communities living within the Cherangany Hills ecosystem include both indigenous and migrant tribes. Kiprop *et al* (2017) reveal that the indigenous communities consist of mainly the Sengwer while the migrant communities include the Keiyo, Marakwet, Pokot, Tugen, and Luhya among others. According to Kenrick (2014) the Cherangany Hills Forest is a significant source of livelihood to these forest adjacent communities who usually obtain herbal medicine, firewood, wild fruits and vegetables, and livestock fodder as well as engaged in crop farming (beans, peas, vegetables, potatoes and green grams) and bee keeping within the forest ecosystem (County Government of Elgeyo Marakwet Integrated Plan, 2013; Kenrick, 2014; Kenya Water Towers Agency, 2019; Rotich, 2019).

1.7.3 Kiptaber Forest Block

Kiptaber Forest Block is found within Marakwet West Constituency, in Elgeyo Marakwet County as shown in Figure 1.2 below. Marakwet West constituency has six elective wards namely: Sengwer, Lelan, Cherangany/Cheborорwa, Arror, Kapsowar and Moiben/Kuserwo as shown in Figure 1.2 below (County Government of Elgeyo Marakwet Integrated Plan, 2013). Marakwet West Constituency covers an estimated area of 804.7 square kilometres (Km^2) (County Government of Elgeyo Marakwet Integrated Plan, 2013). In terms of areal distribution per ward, Sengwer ward covers 161.5 Square Kilometres (Km^2), Lelan ward has an area of 198.4 Km^2, Cherangany/Cheborорwa ward covers 95.2 Km^2, Arror ward has an area of 78.6 Km^2, Kapsowar covers 123.9 Km^2, and Moiben/Kuserwo has an area 147.0 Km^2 (County Government of Elgeyo Marakwet Integrated Plan, 2013). Kiptaberr Forest covers 22,000 Hectares (Ha) and is divided into three zones namely; the highlands, escarpments and the Kerio River.

According to the County Government of Elgeyo Marakwet Integrated Plan (2013) the Kiptaber Forest Block has an average elevation of 2246 metres above the sea level. The area experiences a tropical savannah climatic condition and the areas are covered by the ferrasols, acrisols, and nitosols soils that are very fertile and well drained (County Government of Elgeyo Marakwet Integrated Plan, 2013).

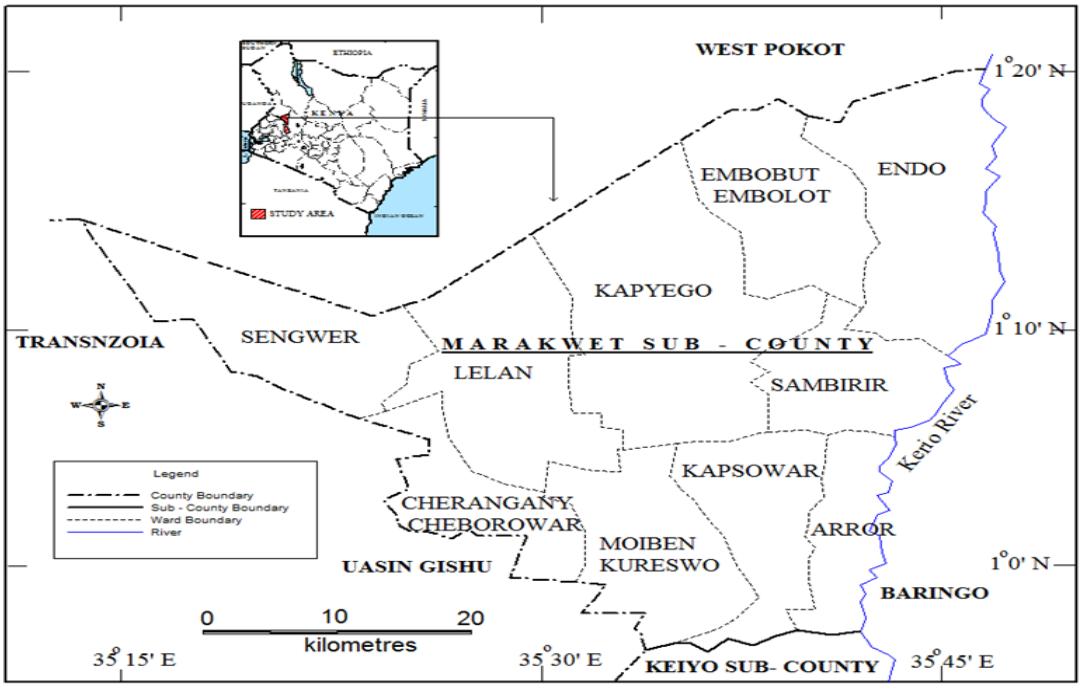

Figure 1.2: Map showing the wards within Marakwet Sub-County
Source: Moi University Department of Geography and Environmental Studies GIS Lab

The area receives annual rainfall of between 400 mm and 1,400 mm. Marakwet West Constituency has a total population of 137,513 people of which 68,948 are male while 68,560 are female residing within 29,523 households and the average household size was 4.6 persons with a population density of 186 persons per square kilometres (Government of Kenya, 2019).

1.7.4 Sengwer Ward and study sites

Sengwer ward has a total of four locations namely; Kamoi location, Kapterit location, Rogor location and Kapcherop location. Moreover, there are a total of eleven sub-locations within Sengwer Ward namely; Kibuga, Kamoi, Kakisango, Rogor, Kapolet, Kipsero, Kapcherop, Chebai and Yatoi (GoK, 2019). Kapterit and Kapcherop locations are located adjacent to the Kiptaberr Forest Reserves and are found within the Sengwer Ward in Marakwet West sub-County within the Elgeyo-Marakwet County in Kenya as shown in Figure 1.3.

Table 1.1: Population distribution in Sengwer Ward per sub-locations

Location	Sub-location	Total Population	Households	Land Area (Km^2)
Kamoi	Kibuga	2371	463	3.7
	Kamoi	2054	420	4.0
	Kakisango	4314	836	18.4
Kapterit	Kapterit	1286	267	2.5
	Kipsambach	650	130	11.4
Rogor	Rogor	765	160	39.8
	Kapolet	575	114	16.7
Kapcherop	Kipsero	1889	364	9.2
	Kapcherop	6542	1738	12.9
	Chebai	1376	250	5.3
	Yatoi	1773	391	15.0
Total		**23595**	**5133**	

Source: Government of Kenya (2019)

Within Kapterit location, the two sub-locations (Kapterit and Kipsambach) were included in this study. The two sub-locations had a total population of about 1936 persons residing within 397 households, land area of 13.9 square kilometres and population density of about 140 persons per square kilometre (Government of Kenya, 2019).

Within Kapcherop location, three sub-locations (Kipsero, Chebai and Yatoi) were sampled while Kapcherop sub-location was excluded because it was mainly a township and most of the residents were not CFA members as shown in Figure 1.3. The three sub-locations within Kapcherop location had a total population of about 5,038 persons residing within 1,005 households, land area of 29.5 square kilometres, and a population density of 171 persons per square kilometre (Government of Kenya, 2019). Therefore, the two locations had a total of 1402 households.

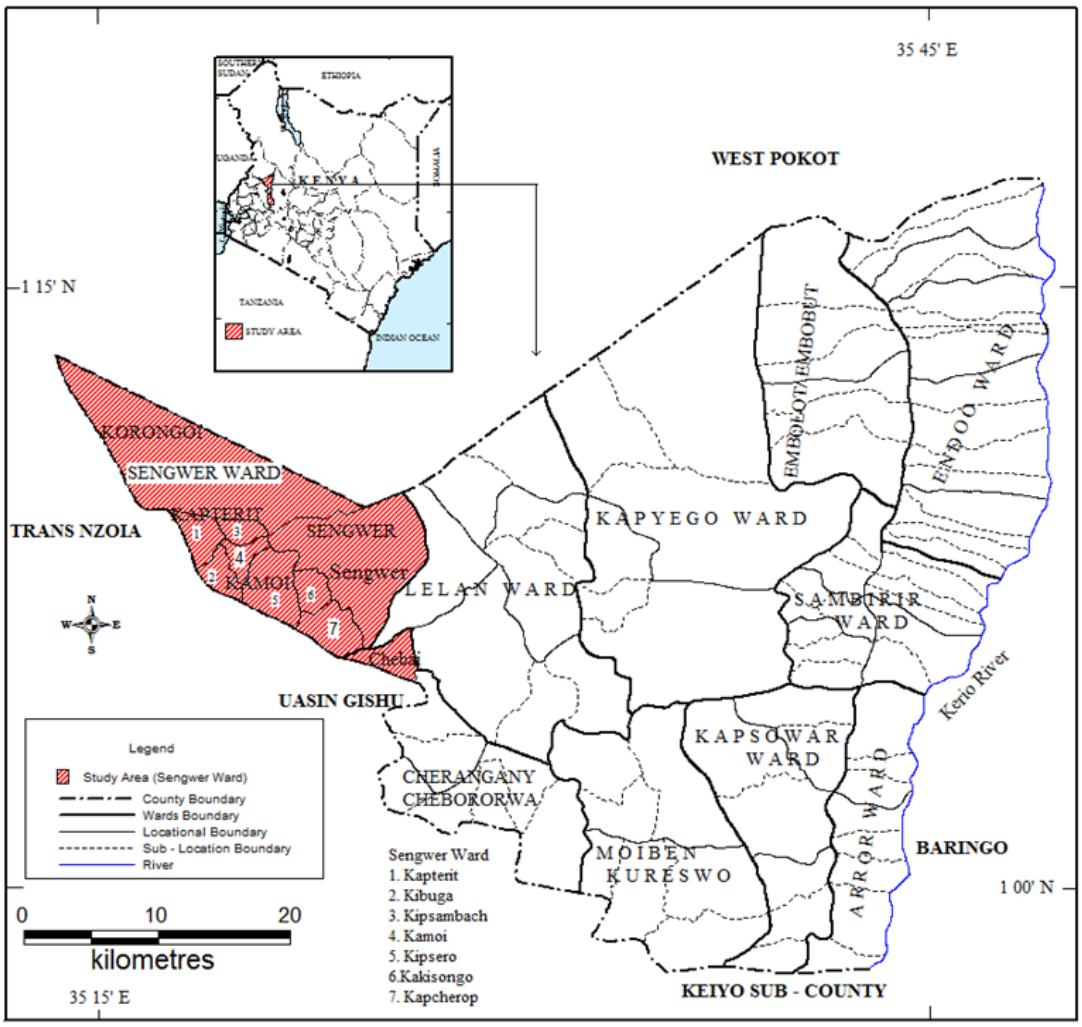

Figure 1.3: Map of Marakwet Sub – County showing the Ward, Location and Sub Locations.
Source: Moi University Department of Geography and Environmental Studies GIS Lab.

1.8 Outline of the Thesis

This thesis comprises of five chapters that examine the gender relations in forest governance and use of forest resources on livelihoods. Chapter one presents the background to the study, the statement of the problem, objectives of the study, hypotheses of the study, significance of the study, scope and limitations of the study and the study area. The existing literature on gender relations in forest governance and use of forest resources as well as theoretical underpinnings of the study was reviewed in chapter two.

Chapter three of this study presents the research design and approach, population and sample size, sampling procedure and techniques, research preparation, methods of data collection, methods of data analysis and presentation, data control and ethical considerations. In chapter four, the following were highlighted: the socio-economic characteristics of the respondents, nature and extent of involvement of husbands and wives of CFA members in forest governance, extent to which husbands and wives shared decision making powers and roles over use of forest resources, as well as the constraints and opportunities for husbands and wives engaging in CFA activities and use of forest resources. Lastly, chapter five provides the summary and conclusions of the study as well as indicates the recommendations for policy, practice and future studies.

CHAPTER TWO

LITERATURE REVIEW, THEORETICAL AND CONCEPTUAL FRAMEWORK

2.0 Introduction

This chapter presents the literature review, theoretical framework and conceptual framework of the study. The literature review focuses on; community participation in forest governance, gender involvement in forest governance, gender responsibilities and rights over use of forest resources, challenges to engagement in forest governance, actors in forest governance, policies and laws guiding forest governance in Kenya, knowledge gaps in literature and summary of literature review. With regard to the theoretical framework, the 'Typology of Participation' model, the Theory of Feminist Political Ecology and 'Gender Box' theoretical framework were examined. While borrowing from the existing discourse on forest governance and the theoretical framework, the conceptual framework was developed and explained.

2.1 Community Participation in Forest Governance

Since 1980's, there has been a shift from the state-centred forest protection strategies to a collaborative forest management approach with the forest adjacent communities (Wasonga *et al.,* 2013). Under the model of community participation in forest governance, forest adjacent communities as well as non-state forest actors engage not only in the protection, management and conservation of state-managed forests but also in decision making over the use of forest resources. A study from Nepal and Sri-Lanka underscore that forest fringe communities participated in decision making over forest related activities under the auspices of the Community Forest User Groups and Community Forestry Programmes (Ekanayake *et al*., 2021; Thapa *et al.,* 2020). In her study conducted among forest adjacent communities in Mexico,

Gutierrez-Zamorah (2021) pointed out that these communities engage in the management and conservation of pine and pine-oak forests through the Community Forest Enterprises. In Nicaragua, Evans *et al* (2020) emphasized that forest fringe communities participated in the protection, management and conservation of forest. A recent study from Ghana indicates that forest adjacent communities participated in natural resource management through the patronage of Community Resource Management Area programme (Soliku, 2021). A growing body of knowledge from Zimbabwe reiterates that forest adjacent communities engage in forest conservation through the Community Areas Management Programme For Indigenous Resources (CAMPFIRE) (Mashapa *et al.*, 2020; Sithole *et al.*, 2021).

Studies from East Africa confirm that Communities living within forested regions in Tanzania engaged in forest protection, capacity building, decision making as well as formulation of forest by-laws (Killian & Hyle, 2020; Luswaga & Nuppenau, 2020; Magessa *et al.,* 2020; Mbise *et al.,* 2021). With regard to community involvement in forest governance in Ethiopia, some researchers advanced that some members of Forest User Groups participated in the drafting forest by-laws as well as making decisions over the management and use of forest resources (Kahsay *et al.,* 2021). Previous studies from Uganda affirmed that forest adjacent communities engaged in the forest governance through the Collaborative Forest Management programmes (Banana *et al.,* 2012). Documented evidence from Kenya reiterates that community participation in forest governance has been conceptualized in terms of 'Participatory Forest Management' (Musyoki *et al.,* 2013; Government of Kenya, 2005).

Under the framework of Participatory Forest Management (PFM), forest fringe communities not only engage in the management and conservation of forest resources but also gain access to forest products (Musyoki *et al.,* 2013). Scholars

reiterated that the first government initiative to promote community participation in forest governance in Kenya was through the launch of the Forest Master Plan in 1991 that was based on the principles of Sustainable Forest Management (Chomba *et al*., 2015). Also, an existing body of knowledge demonstrated that the enactment of forest laws facilitated the formation of community based forest management organizations in Kenya (Kimutai & Watanabe, 2016; Mogoi *et al*., 2012).

Numerous scholars confirmed that the formulation of the Forest Act of 2005 and its enactment in February 2007 necessitated the formation of CFA in Kenya (Chomba *et al*., 2015; Kimutai & Watanabe, 2016; Mogoi *et al*., 2012; Thygesen *et al*., 2016). A CFA is a community based forest organization whose main role is to create a linkage between the forest adjacent communities and the government ministries in the implementation of activities related to forest use, management and conservation (Kimutai & Watanabe, 2016; Thygesen *et al*., 2016). The dynamics in the forest legal framework led to the change of the Forest Department to Kenya Forest Service (KFS) which is a semi-autonomous government institution mandated not only to manage state-owned forests but also finance forest conservation in Kenya (Thygesen *et al*., 2016).

Studies reveal that members of CFAs provide labour during tree seedlings nursery establishment as well as during planting and pruning of trees within the forest (Kimutai & Watanabe, 2016; Mogoi *et al.*, 2012; Mugambi *et al*., 2020; Musyoki *et al*., 2013; Thygesen *et al*., 2016; Wambugu *et al*., 2017). Numerous researchers affirmed that members of the CFA engaged in forest patrol and fighting forest fires which helped in reducing incidences of illegal tree logging and fire spread respectively (Kimutai & Watanabe, 2016; Mogoi *et al.*, 2012; Musyoki *et al*., 2013; Wambugu *et al*., 2017).

Documented evidence demonstrated that some of the members of the CFA were involved in the formulation of rules that guided the: management, compliance with regulations, sanctioning law breakers, arbitration of disputes and extraction of forest resources (Kimutai & Watanabe, 2016; Mogoi *et al*., 2012). With regard to involvement in decision making, Mogoi *et al.* (2012) advanced that some leaders of the CFA engaged in making decisions over when the harvesting of forest products could be done, the kind of technology used in harvesting the forest products as well as the distribution, sale and collection of income from forest resources.

2.2 Gendered Involvement in Forest Governance

Numerous feminist studies from developing countries confirm that both men and women engage in the protection, management, and conservation of forest resources. Studies from India and Nepal reveal that both men and women participated in community forest organizations activities through attendance of the general assembly meetings as well as forest protection committee meetings (Lewark *et al.*, 2011; Rout, 2018). Tuijnman *et al* (2020) advanced that some female representatives that attended the community forest management meetings in Vietnam updated other women who had missed these forest meetings.

In her study based in Peru, Espinosa (2010) found out that some women attended forest related meetings when their husbands were absent because absenteeism attracted a fine. Similarly, studies from Africa corroborate that both men and women attended forest based meetings in the Democratic Republic of Congo (DRC), Tanzania, Uganda and Zambia during which community forest governance issues were discussed (Humphries, 2013; Kalanzi *et al.,* 2020; Rukundo, 2018; Stiem & Krause, 2016).

There is consensus among feminist political ecologists that both men and women spoke during forest management meetings when given the opportunities to do so. Previous studies from India and Nepal confirmed that just like men who spoke during meetings, some women were confident enough to voice their opinions during forest meetings (Agarwal, 2010; Sanjay, 2017). Although men dominated the forest based meetings in South America, existing literature from Brazil and Nicaragua pointed out that some women spoke during forest meetings especially those that were women-only and those that were held in the field (Evans *et al*., 2020; Shanley *et al.*, 2011). Documented evidence demonstrated that some women especially those with external exposure, training, high educational levels and knowledge spoke in the presence of men during forest related meetings in Cameroon, DRC, and Tanzania (Humphries, 2013; Ngono & Munongo, 2014; Samndong & Kjosavik, 2017; Stiem & Krause, 2016).

Empirical evidence from the global south indicates that both men and women participated in forest rule making. Previous studies showed that both men and women participated in the formulation of forest rules in Indonesia, Peru, and Uganda (Monterroso *et al.*, 2019). Studies based in Asia contended that men and women participated in the drafting of the constitution and operational plan of the Forest User Groups as well as forest rules in India and Nepal (Gautam, 2009; Rout, 2018; Sanjay, 2017). In their study on role of women in the implementation of Reduce Emissions from Deforestation and Forest Degradation (REDD+) project, Larson *et al.* (2015) found out that 82 % of the women sampled engaged actively in the formulation of rules guiding the use of forest resources in Cameroon. Existing literature from Tanzania emphasized that both men and women participated in

making rules guiding forest protection and conservation (Killian & Hyle, 2020; Larson *et al.,* 2015; Mhache, 2018).

A growing body of knowledge from developing countries posited that both men and women participated in forest protection. Existing literature revealed that both men and women engaged in forest patrols to guard against violation of forest rules as well as apprehension of illegal forest users in India, Indonesia, Nepal and Thailand (Agarwal, 2009a; Herawati *et al.,* 2019; Lewark *et al*., 2011; Rout, 2018; Siripurapu & Geores, 2016; Upadhyay *et al*., 2013). In their study conducted in Peru, Monterroso *et al.* (2019) found out that women participated in the enforcement of local forest use rules. More studies from Africa averred that both men and women participated not only in forest patrol but also apprehension of illegal forest users and control of forest fires in Cameroon, Kenya, Tanzania and Zambia (Bitange *et al.,* 2021; Larson *et al.*, 2015; Mhache, 2018; Rukundo, 2018). On the other hand, some scholars pointed out that forest patrols and fighting of forest fires in Kenya and Uganda were carried out by men only (Banana *et al*., 2012; Musyoki *et al*., 2013).

Several feminist environmentalists advanced that both men and women engaged in the reforestation programmes in the developing countries. Some scholars contended that men alongside women engaged in the management of tree nurseries, planting, weeding, thinning, and pruning of trees in Indonesia, Nepal and Vietnam (Catacutan & Villamor, 2016; Gurung *et al.,* 2013; Lewark *et al.,* 2011; Manginsela, 2016; Mulyoutami *et al.,* 2015). Studies from Nicaragua and Mexico confirmed that women just like men participated actively in the management of tree nurseries, planting of trees and pruning the tree branches (Evans *et al.,* 2017; Pineda-López *et al*., 2015). Although men dominated tree planting and pruning of trees in Africa,

some studies reiterated that both men and women engaged in tree seedling management, planting, weeding, thinning and pruning in Burkina Faso, Kenya and Uganda (Bitange *et al.,* 2021; Elias, 2015; Kalanzi *et al.,* 2020).

Some feminist political ecologists argued that although both men and women were members of forest executive committees, men dominated the decision making over forest related issues in developing countries. For instance, Samndong & Kjosavik (2017) observed that women rarely engaged in decision making concerning the allocation and management of forest land in the DRC due to fact that it was done by village leaders who were mainly male dominated. Some scholars argued that both men and women were involved in decision making over forest issues in the forested areas in Cameroon, Tanzania and Uganda (Egunyu & Reed, 2015; Larson *et al.,* 2015). Although the existing literature demonstrated that women were members of the forest executive committees in Tanzania and Uganda, some researchers revealed that men dominated both in the composition and power to make decisions with regard to forest rehabilitation (Kalanzi *et al.,* 2020; Killian & Hyle, 2020). On the contrary, other studies emphasized that women dominated the decisions over forest resources in Burkina Faso, Nicaragua and Peru (Elias, 2015; Espinosa, 2010; Evans *et al*. 2017).

2.3 Gendered Rights, Responsibilities and Benefits from Forest Resources

Existing literature indicates that forest adjacent communities not only have restricted access to forest land but also have usufruct rights over some forest products. Some researchers argued that some forest adjacent communities cultivate crops within the state-owned forests (Kimutai & Watanabe, 2016; Musyoki *et al*., 2013). Kalanzi *et al*. (2020) pointed out that women dominated the decision making over the type of

crops to be cultivated within agro-forestry plots in Uganda due to the gender ascribed roles of women to prepare food for their households. Although some studies contended that men and women played complementary roles such as weeding and harvesting of crops, there is compelling evidence indicating the existence of gender variations (Manginsela, 2016) which is attributed to cultural factors and religious beliefs (Kalanzi *et al*., 2020; Manginsela, 2016).

A growing body of discourse on use of non-timber forest resources indicates that some members of communities residing near forested areas engaged in the collection of fodder and grazing of livestock within the forest glades (grasslands) during the drought season. In their study conducted in Zimbabwe, Sithole *et al*. (2021) argued that men not only had access rights to grass but also had more decision-making powers over the use of communal grazing lands. In his doctoral study conducted among the Maasai community residing near Loita Forest in Kenya, Mbuvi (2018) emphasized that men were more likely than women to graze their livestock within the forested lands because the Maasai women were considered 'home keepers'. On the contrary, other researchers reiterated that some women had access rights to fodder and dominated the collection of pasture from the grasslands in Eastern region of Kenya (Rocheleau & Edmunds, 1997). While explaining how the forest adjacent communities gained access to grazing rights within state-owned forests in Kenya, Rotich (2019) confirmed that grazing of livestock in the forest was permitted upon payment of royalty fee to the Kenya Forest Service.

There is consensus among feminist political ecologists that both men and women have rights over wild fruits and vegetables growing within forested areas. In Indonesia, Manginsela (2016) affirmed that some men had access to wild fruits and vegetables growing in the deeper parts of the forest while women collected fruits and

vegetables growing at the edge of the forest for home consumption and for sale. With regard to selling of forest products, Evans *et al* (2017) posited that women dominated the selling of wild fruits in Nicaragua.

While explaining the intra-gender variations in women's rights over néré pods in Burkina Faso, Pehou *et al*. (2020) pointed out that women from indigenous forest adjacent communities had more rights over néré pods compared to women from migrant tribes. Moreover, Kalanzi *et al*. (2020) found out that women engaged more than men in the collection of fruits for domestic consumption in Uganda. Although earlier studies from Kenya indicated that women had more access and use rights over wild fruits than men found in grasslands located in Eastern region (Rocheleau & Edmunds, 1997), recent studies argued that both men and women harvested wild fruits from the forested lands within Rift Valley region (Kagombe *et al*., 2015; Rotich, 2019).

Numerous studies contended that communities living adjacent to state-owned forests obtained firewood from these forests. While examining gender aspects in the collection of firewood in Indonesia, Manginsela (2016) argued that both men and women engaged in the collection of fuel wood from state-protected forests. Although men and women made decisions about the collection and use of fuel wood in Africa, several authors argue that women had more rights and dominated the collection of fuel wood because this activity was regarded as a 'feminine' (Matiku *et al.*, 2013; Sithole *et al.*, 2021). In relation to the gender disparities in the amount of firewood collected, a study from Ethiopia demonstrated that men managed the collection and transportation of large amount of firewood while women coordinated the collection of small quantity of firewood (Abate, 2020). In a study conducted along the Eastern Coast of Africa, Fortnam *et al* (2019) reported that women were involved in the

collection of firewood. Empirical evidence from the study by Rotich (2019) corroborated that rural residents living near state owned forests in Kenya gained the right to harvest firewood by paying permit fees to the Kenya Forest Service.

Some scholars reiterated that men and women had equal access rights to collection of herbal plants growing within the forested areas. In India, a study carried out by Agrawal *et al* (2006) confirmed that women collected herbal plants and extracted herbal medicines mainly for sale. Although both men and women had access and control over medicinal plants growing within the forest in Indonesia, Manginsela (2016) argued that women had more access and control over extraction of herbal medicine to cater for health needs. In their study conducted in Uganda, Kalanzi *et al*. (2020) pointed out that women participated in the collection of tree leaves used for the preparation of herbal medicine. While explaining the gender dimension in the extraction and preparation of herbal medicine from government protected forest reserves in Kenya, Rotich (2019) contended that both male and female herbalists collected herbal plants for preparation of herbal medicine.

Studies demonstrate that honey is harvested from the bee-hives hanged in state-owned forests. In a research conducted among the communities residing within forest reserves in Kenya, Rotich (2019) revealed that the indigenous communities have continued to practice bee-keeping and honey harvesting as a source of livelihood. While assessing the gender aspects in bee-keeping and honey harvesting, Mutune & Lund (2016) argued that men dominated the practice of bee keeping within state owned forests in Kenya. Kiprop *et al*. (2017) attributed this male dominance in bee-keeping and honey harvesting to the indigenous knowledge and skills about bee-hive making and harvesting of honey as well as socio-cultural norms.

2.4 Challenges to Gendered Involvement in Forest Governance

Scholars argue that intra-household gender relations and discriminatory socio-cultural norms hindered the involvement of women in forest management. While explaining how unbalanced intra-household gender relations hinder the involvement of women in forest management, Evans *et al* (2020) averred that some female leaders of community forest organizations in Nicaragua were not only secluded and sanctioned by the community forest organizations but also physically abused by their spouses to discourage them from participating in forest governance. In addition, Onzere *et al* (2020) opined that some men denied their spouses the permission to attend forest meetings in Liberia. Moreover, Mashapa *et al* (2020) advanced that the female members of the CAMPFIRE were restricted from participating in meetings and decision making in Zimbabwe due to socio-cultural practices and norms.

Owing to discriminatory gender norms, Killian & Hyle (2020) posited that some of the women that attended forest meetings in Tanzania did not speak or engage in decision making. Egunyu & Reed (2015) corroborated that the fear of men influenced the spaces and opportunities available for women to occupy executive positions in forest organizations in Uganda. While accounting for the low involvement of women in tree planting, studies confirm that cultural norms contributed to the low participation of women in tree planting activities in Kenya and Uganda (Banana *et al*., 2012; Rocheleau & Edmunds, 1997).

Due to involvement of women in the performance of household chores and men in other livelihood activities, Onzere *et al* (2020) opined that men and women encountered time and labour constraints that subsequently restricted their involvement in other activities including forest management in Liberia. In

Zimbabwe, Mashapa *et al* (2020) observed that most women were not included in the CAMPFIRE committee since they were busy with household roles such as fetching fuel wood and collection of wild foods. In their study conducted in Uganda, Banana *et al* (2012) reiterated that heavy household chores accounted for the low involvement of women in tree planting programmes. While supporting the debate that women are restricted from engaging in forest management activities due to time limitations in Kenya, Musyoki *et al* (2013) advanced that the women are hindered from engaging in forest management programmes due to the tiring and time consuming household tasks such as child care, cooking, fetching water and collection of firewood.

Existing body of knowledge from developing economies demonstrate that financial constraints and mismanagement of organizations' finances discouraged men and women from joining and paying the subscription fees to Community Based Forest Organizations. As reported by Uprety *et al* (2012) some of the members of Community Forest organizations in Nepal were excluded from the community forest programmes since they were unable to pay the forest entrance fee so that they could graze their livestock in the forest. In the DRC, Samndong & Kjosavik (2017) noted that women did not participate in community forest organizations' activities due to the inability to pay the membership levies. Banana *et al* (2012) and Okumu (2017) affirmed that mismanagement of forest association funds in Kenya and Uganda was one of the reasons for the failure of forest organizations to achieve their objectives. Studies carried out in Kenya pointed out that inadequate finance to pay for CFA membership and annual subscription fees hindered some of the forest adjacent communities from joining the CFA (Kimutai & Watanabe, 2016; Mutune *et al.*, 2015).

Several authors supported the assertion that inadequate forest information and training hindered the involvement of men and women in forest management and conservation in developing nations. Studies from Nepal asserted that women were not informed about the rules guiding the management and use of forest resources (Uprety *et al*., 2012). In their study conducted in Tanzania, Killian & Hyle (2020) pointed out that women unlike men had insufficient knowledge about the decisions on forest management and rules guiding the use of forest resources. Documented evidence from Uganda revealed that there was inadequate training and sensitization of the forest association members about forest management activities (Banana *et al*., 2012). Some scholars have attributed the low participation in forest organizational activities in Kenya to lack of information about how to join the organizations and the main functions of the CFA (Kimutai & Watanabe, 2016; Mogoi *et al*., 2012; Mutune *et al.,* 2015).

Existing literature advanced that distance from the forest boundary hinder the involvement of forest adjacent communities in forest management within developing nations (Ndungo *et al.,* 2013). A study carried out in Uganda by Banana *et al* (2012) corroborated that long distance from their homes hindered the involvement of women in forest management. In his doctoral study that was conducted in Kenya, Okumu (2017:132) revealed that the households that are located far from the forest incur higher '*opportunity costs of participating in CFA activities p. 132'.* Musyoki *et al* (2013) revealed that distance of homesteads from the forest significantly influenced the decision of forest adjacent communities to participate in PFM within Ontulili and Ngare Ndare forests in North Central Kenya.

2.5 Actors in Forest Governance

Existing literature demonstrated that the interaction between and among various forest actors is critical in the management and conservation of forest resources (Davis *et al.,* 2013). Studies argued that the government ministries and departments are central in the management of forest resources in developing countries (Banana *et al*., 2012; Derkyi *et al.,* 2013). In Ghana, the Ministry of Lands and Natural Resources was mandated to draft forest policies and laws while the Forestry Commission implemented the forest policies, laws and management goals (Derkyi *et al.,* 2013). In Uganda, Banana *et al* (2012) affirmed that the National Forest Authority and District Forest Services were the main government institutions mandated to draft forest policies as well as manage and conserve forest resources.

There is consensus within the forest governance literature that local based public administrators played a critical role in the management of forest resources (Derkyi *et al*., 2013). In Sierra Leone, Komorah (2020) indicated that the customary chiefs collaborated with the Gola Rainforest Conservation in the implementation of the Gola REDD+ project programmes. In Ghana, Derkyi *et al* (2013) noted that the chiefs and village elders were the stakeholders representing the customary forest governing structure. In Zimbabwe, Sithole *et al.* (2021) revealed that Rural District Councils represented the communities as well as received and managed revenues under the CAMPFIRE natural resource management programme. In Tanzania, Killian & Hyle (2020) contended that the Village National Resource Council (local based forest institution) engaged in forest management through ensuring conservation plans were implemented and forest rehabilitation was carried out.

More studies from Africa reiterated that local based non-governmental organizations and individuals engaged in forest governance. While supporting this assertion, Onzere *et al* (2020) reiterated that the Community Forestry Development Committee - a local based community organization engaged in forest governance by acting as a link between the local communities and the logging companies and government agencies in Liberia. While contributing to the literature on the role of key actors in forest governance, Derkyi (2012) pointed out that the civil society as well as NGOs promoted capacity building, forest rehabilitation programmes, legal processes and engineered forest policy reforms. Kahsay *et al* (2021) confirmed that the international organizations in partnership with the Ethiopian government established the PFM programme in Ethiopia. In Uganda, Banana *et al* (2012) indicated that Non-Governmental Organizations and Community Based Organizations promoted the engagement of forest fringe communities in forest management, provided financial support, enhanced dissemination of forest information, and promoted networking among the forest adjacent communities.

2.6 Policies and Laws Guiding Forest Governance in Kenya

In Kenya, the first forest policy that dealt with conservation and management of state-protected forest was formulated in 1957 and revised in 1968 as Sessional Paper number one (Mathu, 2007). However, this policy failed to adequately appreciate the roles of the forest fringe communities in forest governance and their rights over the use of state-owned forest. This necessitated the formulation and enactment of the Forest Act of 2005 which recognised the role and responsibility of local communities and other stakeholders in the management of state-owned forests (Mathu, 2007, GoK, 2005). However, this forest Act outlaws the setting of forest fires, illegal grazing, illegal hunting, illegal entry, and possession of charcoal without

permit, cultivation of illegal plants and damping of toxic substances within the forest.

As indicated in the Forest Act of 2005, forest adjacent communities with interests in joining CFAs must be members of pre-existing Forest User Groups (FUGs) and should be available to participate in CFA activities (Mutune *et al*., 2015; Thygesen *et al*., 2016). According to the Government of Kenya (2005) a member or members of a forest community may register a CFA under the Societies Act: the association members may apply to the Director of Kenya Forest Service for permission to engage in the conservation and management of forests. According to the PFM guidelines the interested community members must form CFAs and the selection of leaders of these associations must be through a transparent electoral procedure [Kenya Forest Service, (KFS) 2015]. In addition, the forest association leadership must represent the interests of forest users and other actors as well as consider gender mainstreaming and affirmative action for the marginalized category of people (Kenya Forest Service, 2015). Chomba *et al* (2015) reported that CFAs are supposed to design forest management plans and sign management agreements with Kenya Forest Service as a requirement for their involvement in forest management.

Upon the registration of the CFA as stipulated in the Forest Act of 2005, Thygesen *et al* (2016) noted that the CFA should apply for the permit to engage in the forest management with the Kenya Forest Service and other key forest actors. Also, the forest management plan accompanying this application should specify the proposed use and conservation mechanisms within the forested area (Thygesen *et al*., 2016). After the approval of management plan, a forest management agreement describing the responsibilities of the CFA in forest management and conservation as well as forest user rights is signed between the KFS and the CFA. However, Thygesen *et al*

(2016) contended that one of the weaknesses of the Forest Act of 2005 was that it failed to give guidelines on the membership and governance structure of the CFA as well as the benefits that should be granted to the CFA and this necessitated the amendment of the Forest Act of 2005 in 2016 (GoK, 2016).

As stipulated in the Forest Act of 2016, the CFA in collaboration with the Kenya Forest Service has the following main forest governance roles: (a) formulate and implement sustainable forest programmes, (b) protect sacred groves and protected trees, (c) enforce forest laws, (d) help in fire fighting and (e) communicate with KFS officers and forest guards about forest status and illegal activities (GoK, 2016). Moreover, the Forest Act of 2016 enumerated the forest user rights of the CFA members and they included: (i) establishment of crop plantation, (ii) harvesting of livestock pasture and livestock grazing, (iii) harvesting of fuel wood, (iv) harvesting of honey, and (v) collection of medicinal plants (GoK, 2016).

2.7 Knowledge Gaps in Forest Governance Literature

This sub-section presents the existing knowledge gaps within the forest governance discourse as summarized in Table 2.1. From the documented evidence presented above, there is insufficient information about whether husbands and wives belonging to the same forest organization engaged in forest governance to the same extent in terms of length of time, place and payment of CFA fees as well as decision to continue engaging in forest governance.

Table 2.1: The existing knowledge gap in reviewed literature

Existing literature	Existing sub-objectives	Knowledge gap and questions
1. Documented evidence show that men and women engage in forest governance within developing regions.	❖ Men and women are members of community based forest organizations. ❖ Men and women attend forest meetings. ❖ Men and women speak during forest meetings. ❖ Men and women engage in reforestation and forest protection activities. ❖ Men and women participate in decision making over forest issues	❖ Are husbands and wives been CFA members for the same length of time and do they share roles in paying for the CFA fees? ❖ Do husbands and wives attend CFA meetings at same frequency, place and time? ❖ Are husbands and wives consulted by the CFA leaders at the same extent? ❖ Do husbands and wives engage in reforestation and forest protection activities to same extent? ❖ Do husbands and wives intend to continue engaging in CFA activities?
2. There exist literature on the decision making powers, rights and responsibilities of men and women over use of forest resources.	1. Men and women engage in decision making over use and sale of forest resources 2. Men and women have rights and performed various responsibilities over use of forest resources	❖ Do husbands and wives make joint decision over use and sale of forest resources? ❖ Do husbands and wives share responsibilities and rights over use of forest resources ❖ Do husbands and wives intend to continue engaging in use of forest resources?
3. A growing body of knowledge reiterates that the involvement in forest governance and use of forest resources is significant to livelihoods	Through engagement in forest governance and use of forest resources, both men and women gained access to: ❖ Human food, ❖ Livestock feeds ❖ Income, ❖ Herbal medicine, ❖ Fuel wood	❖ Do the involvement of both husbands and wives in forest governance and use of forest resources influence level of access to human food, livestock feeds, income, herbal medicine, and fuel wood? ❖ Do spouses share the income from forest governance and sale of forest resources equally? If no, why not?
4. Previous studies indicate the various challenges that hindered the involvement of men and women in forest governance and use of forest resources	Engagement of men and women in forest governance and use of forest resources is hindered by: ❖ Intra-household gender relations, time constraints, and financial challenges. ❖ Distance factors, forest information and training, ❖ Gender norms of behaviour	❖ Do these constraints hinder the involvement of husbands and wives in forest governance to same extent? If no, why not? ❖ Do husbands and wives have same opportunities to minimize these challenges? If no, why not?

Source: Author (2023)

There is also scanty information about whether male and female spouses who are CFA members jointly made decision over the use of forest resources and sale of forest products as well as shared responsibilities and rights over use of forest resources.

From the existing literature, insufficient information exists on the implications of gendered decision making powers and roles in forest governance and use of forest resources on access to human food, livestock feeds, income, herbal medicine, and wood fuel. Moreover, there is little information that exists on how the husbands and wives shared income from forest governance and sale of forest resources.

The growing body of literature has little information as to whether the spouses belonging to same forest management organization were discouraged by same challenges and whether they solved in the same way.

2.8 Summary of the Literature Review

Previous studies affirmed that some male and female members of forest based organizations attended forest related meetings. It has been revealed that although both men and women were given opportunities to speak during the forest related meetings, the male members dominated these meetings. Moreover, there was spatial-temporal variation in the extent to which men and women participated in forest patrols, reporting of cases of illegal forest use, apprehension of illegal forest users, as well as control of forest fire. Although men dominated silvicultural activities, it could be inferred that both men and women engaged in the reforestation activities. Also, the literature indicates that both men and women engaged not only in the drafting of forest rules but also implementation of the forest laws and regulations.

In summary, the reviewed literature demonstrated that forest adjacent communities cultivated crops within the state-owned forests. It is clear from existing literature that men not only gained access rights to grass in forested areas but they also had more decision-making powers on the use of communal grazing lands. The reviewed studies revealed that both men and women had rights over wild fruits and vegetables located in the forested areas. Although both men and women made decisions over the collection and use of fuel wood, the literature review showed that women had more rights and dominated the collection of fuel wood. It could concluded that although both men and women had access to and control over medicinal plants growing in the forest, women dominated the extraction of herbal medicine to cater for health needs. The existing literature pointed out that men dominated the decision making and responsibility of bee keeping because they had adequate indigenous ecological knowledge about bee-hive making and harvesting of honey.

In a nutshell, unequal intra-household gender relations and discriminatory socio-cultural norms discouraged some female members not to: attend forest meetings, speak during forest meetings and engage in decision making over forest resources. It is clear that time constraints hindered both men and women from attending forest meetings as well as their involvement in tree planting. Existing literature reveals that financial constraints hindered both men and women from paying the subscription fees to forest organizations and participation in forest monitoring activities. It was concluded that women unlike men had insufficient knowledge about the decisions on forest management and rules guiding the use of forest resources. In summary, long distance from homesteads hindered the involvement of both men and women in the monitoring and patrolling of the forest.

It is clear from the existing literature that government ministries and public administrators were involved not only in the drafting forest policies and laws but also implementing the forest policies and laws. In addition, Non-governmental organizations, media and civil societies engaged in local capacity building, forest rehabilitation, promoting legal processes and policy reforms, and decision-making. Forest policies on community forest management promoted the establishment of local based forest organizations in Africa.

2.9 Theoretical Framework

In the present study, three theoretical perspectives namely: 'Typology of Participation' model, Theory of Feminist Political Ecology, and 'Gender Box' theoretical framework were adopted. The three theoretical approaches guided the understanding of the research problem and conceptualization of the variables mainly because they have been used to complement each other in the conceptualization of the research problem and variables as well as overcome the weaknesses of each of the theories as explained below.

2.9.1 'Typology of Participation' model

The 'Typology of Participation' model was proposed by Bina Agarwal in 2001 and updated in 2010 (Agarwal, 2001; Agarwal, 2010). Bina Agarwal theorizes that the level of participation in forest governance could be assessed at six main levels namely: nominal, passive, consultative, activity-specific, active and interactive (Agarwal, 2001; Agarwal, 2010). As argued by Agarwal (2001; 2010) nominal participation is characterized by one being a member of a forest management institution (Agarwal, 2001; Agarwal, 2010). She contended that passive participation is indicated by a member of the forest based organization attending the forest related meetings as well as being informed about the decisions made without voicing their

concerns (Agarwal, 2001; Agarwal, 2010). During the consultative participation, a member of a forest management institution may be asked an opinion on a particular forest issue but he or she does not influence the decisions being made (Agarwal, 2001; Agarwal, 2010).

As noted by Agarwal (2001, 2010) activity-specific participation is characterized by a member of a forest based organization performing a particular forest management role or task. Agarwal (2001, 2010) advanced that active involvement in forest management institutions is indicated by a member of forest based organizations not only expressing his or her opinion but also engaging in critical environmental initiatives. Finally, Agarwal (2001, 2010) proposed that during the interactive involvement a member of a forest based organization not only occupy a leadership position but also influences the forest decisions and engaged in empowering activities.

The 'Typology of Participation model' has been used by other scholars in their studies. While using the Typology of Participation model, Upadhyay *et al.* (2013) observed that women in Thailand engaged in empowering activities such as conflict resolution, taking personal initiatives, organization and co-ordination of training within other organizations. Moreover, Samndong & Kjosavik (2017) used the 'Typology of Participation' model in their study to assess gender dimensions in forest governance and REDD+ in Equateur Province of the DRC.

In the current study, nominal level of participation in Community Forest Association activities was conceptualized in terms of; length of membership in the CFA and payment of CFA subscription fees. Passive involvement in forest governance was conceptualized in terms of; frequency of attending CFA meetings, venue of CFA

meetings, and time of CFA meetings. With regard to consultative participation, the extent of consultation between CFA members and leaders during the forest meetings was assessed. Borrowing from the arguments of Bina Agarwal, activity-specific participation was conceived in terms of the roles of husbands and wives during reforestation activities. In the current research, active involvement in forest governance was conceptualized in terms of formulation and implementation of forest rules and laws. In this study, interactive level of participation was assessed in terms of making the decision as to whether to continue with CFA activities. However, the 'Typology of Participation' model does not account for the gender differences in the nature and extent of participation in forest governance and use of forest resources. This necessitated for the choice of the theory of Feminist Political Ecology (FPE) which accounts for the gender disparities during management and use of forest resources.

2.9.2 Theory of Feminist Political Ecology

The theory of Feminist Political Ecology (FPE) was proposed by Dianne Rocheleau, Barbara Thomas-Slayter and Esther Wangari in their conceptual framework in 1996. The theory of FPE integrates the ideas of political ecology, feminist cultural ecology, feminist geography and feminist political economy (Rocheleau *et al.,* 1996). Political ecologists deal with not only decision making over access to forest resources and the unbalanced distribution of resources but also the factors that influence environmental regulations and practices (Rocheleau *et al*., 1996).

As proposed by Rocheleau *et al* (1996) the theory of FPE acknowledges gender as a significant factor in influencing the level of access to and control over natural resources, the mechanisms of environmental change, the struggle to promote

livelihoods, and the capacity of communities to achieve sustainable development. Feminist political ecologists argue that gender interacts with other social factors such as class, race, culture and national identity to shape the experiences and interests of local communities (Rocheleau *et al.*, 1996). Proponents of the theory of FPE posit that there are three main themes that are associated with environmental governance: gender knowledge; gender rights and responsibilities; and gender environmental politics and activism (Rocheleau *et al*., 1996; Manginsela, 2016).

The theme of gender knowledge deals with the survival strategies adopted by men and women as well as gender variations in the possession of ecological knowledge in rural areas (Rocheleau *et al*., 1996). According to Rocheleau *et al* (1996) gender knowledge includes the creation, maintenance and protection of a suitable environment at home, work and regional levels. Although there are gender variations in ecological knowledge, feminist political ecologists advanced that this knowledge possessed by men and women usually complemented each other (Rocheleau *et al*., 1996). It has been argued by feminist political ecologists that women have more specialized ecological knowledge than men due to their multitude responsibilities of reproduction, production, marketing and use of natural resources (Manginsela, 2016). While contributing to the debate on existence of gender-specific knowledge about the natural ecosystems, Rocheleau (1995) affirmed that the rural-urban migration of men has left women with new roles of managing the rural ecosystems which has led to the emergence of 'new spatial division of labour' with regard to indigenous ecological knowledge among the women.

While advancing the theme of gender responsibilities and rights, Rocheleau *et al* (1996:4) proposed that there are gender variations in ownership of '*property,*

resources, space' as well as rights over natural resources. With regard to gender responsibilities, Rocheleau *et al* (1996) asserted that men and women performed different roles in the management and conservation of forest resources. Rocheleau *et al* (1996) revealed that gender rights may be *de jure* (governed by statutory laws) which are associated with women or *de facto* rights (guided by traditional customs) which are linked with women. The proponents of the theory of FPE argued that gender division of power recognizes the preservation, modification, and restoration of natural resources as well as to control the actions of other key actors (Rocheleau *et al*., 1996). At the household level, unbalanced gender power relations have contributed to gender division of labour and resources. Feminist political ecologists contend that culture accounts for the variation in the gender spaces and power over access to and management of natural resources (Rocheleau *et al*., 1996). The proponents of the theory of FPE affirm that natural resources are contested by numerous actors at various levels and the nature of natural resources usually change across space and over time (Rocheleau *et al*., 1996). The FPE theorists attribute the dynamics and variations in access to forest resources to diversity in human needs, knowledge, skills, capacities and power relations based on gender, class, ethnicity and geographical location (Rocheleau *et al*., 1996). Moreover, interactions between users, owners and managers of natural resources may result into conflicts, cooperation or harmonious co-existence (Rocheleau *et al*., 1996).

As argued by Rocheleau and other theorists (1996) the theme of gender environmental politics and grass roots activism is manifested in involvement of men and women in local social groups, movements and associations that engage in socio-economic, environmental and political issues. Rocheleau *et al* (1996) stressed that there is a substantial increase in the proportion of women involved in environmental

and economic issues which could be attributed to not only changes in the local environmental concerns and scholarly shift towards 'sustainable development' but also redefinition of women's identities and that of gender. Further, the theme of gender environmental politics and activism assesses the triggers of the environmental grass root activism.

The theory of FPE has been applied in several studies to examine gender dimensions in use, management and conservation of forest resources. For instance, Westervelt (2017) used the theory of FPE in her doctoral study to assess the gender dimensions of land change, livelihood shift, forest use, and decision-making among Loita Maasai of southern Kenya. Soliku (2021) applied the theory of FPE to examine how gender relations influence the extent to which men and women gained access to and control over natural resources, the effects of conservation on the livelihoods of men and women and the overall impacts of these effects on collaborative natural resources management in Ghana. Sithole and other scholars (2021) used the FPE theory in assessing gender spaces in natural resource utilization for sustainable development in rural communities in Zimbabwe. In her research entitled: '*The coloniality of neoliberal biopolitics: Mainstreaming gender in community forestry in Oaxaca, Mexico*', Gutierrez-Zamora (2021) contended that the theory of FPE enabled her to assess how gender mainstreaming could be incorporated in community forestry against the social relations of gender and racism. Tuijnman *et al.,* (2020) used the theory of FPE to analyze the gender roles, responsibilities and effects of payments for environmental services on local livelihoods in Vietnam. In her doctoral thesis, Manginsela (2016) borrowed the ideas of the theory of FPE to assess how factors such as culture, household responsibilities, indigenous knowledge, and government

policies influenced the involvement of men and women in use, management and conservation of forest resources in Indonesia.

In the present study, the theory of FPE was critical in examining the intra-household gender sharing of decision making powers, responsibilities, rights and income that are obtained from the use of forest resources within Cherangany Hills Forest in Kenya. Also, the FPE theory informed the current study in establishing how culture accounts for the gender differentials in not only the involvement of men and women in forest management and conservation but also the extent to which men and women have access to and control of forest resources. The theory of Feminist Political Ecology fails to recognize the opportunities for men and women engaging in use of forest resources. Therefore, a need for the 'Gender Box' theoretical framework was suitable in accounting for the challenges and opportunities for husbands and wives engaging in forest governance.

2.9.3 'Gender Box' theoretical framework

In their 'Gender Box' theoretical framework, Colfer & Minarchek (2013) proposed that the factors that hinder or promote the gender involvement in forest governance operate at three inter-connected scales, namely: micro-scale, meso-scale and macro-scale. At the micro-scale level, Colfer & Minarchek (2013) advanced that the engagement of men and women in forest management institutions could be hindered by domestic roles and intra-household power dynamics. Colfer & Minarchek (2013) argued that intra-household power dynamics is manifested in the varied interests that men and women have, women's vulnerability to force, and intra-household bargaining. Vulnerability to force is evidenced by domestic violence while intra-household bargaining is demonstrated by women gaining the power through growing

older, absence of men, external support, increased income or wealth, and the labour becomes more lucrative for the household (Colfer & Minarchek, 2013).

With regard to the meso-scale level, Colfer & Minarchek (2013) advanced that the interactions at the village level influenced access to forest resources. Colfer & Minarchek (2013) contended that access to information, educational opportunities, and financial resources may hinder the involvement of men and women in forest management organizations. At the macro-scale level, Colfer & Minarchek (2013) proposed that socio-cultural norms may hinder the involvement of men and women in forest management institutions. They specifically argue that the themes of hierarchy and hegemonic masculinity have strong implications on the involvement of women in forest management (Colfer & Minarchek, 2013).

In relation to the theme of hierarchy, Colfer & Minarchek (2013) affirm that women are usually assigned lower value and therefore there is low women engagement in forest management in more conservative societies. While explaining how hegemonic masculinity influences the involvement of women in forest management, Colfer & Minarchek (2013) observed that men are ascribed roles in the society as providers, protectors and dominators within their households. This ‘Gender Box’ framework was significant in this study especially in assessing the constraints and opportunities to the involvement of men and women in forest governance.

Borrowing from this framework, the micro-scale level was examined in terms of how intra-household gender relations and time constraints hindered the involvement of husbands and wives in forest governance. The challenges at the meso-scale level was analyzed in terms of how financial constraints, distance from forest boundary as well as inadequate forest knowledge and training hindered the involvement of

husbands and wives in forest governance. With regard to the macro-scale level, gender norms of behaviour were investigated. But, this theoretical framework does not propose the opportunities available for both men and women engaging in forest governance and use of forest resources.

2.10 Conceptual Framework

It was critical to use the conceptual framework in this study so that the themes and concepts advanced in the three theoretical frameworks could be integrated in understanding the research questions and identification of key variables. The conceptual framework of this study consists of the independent variables, intervening variables and the dependent variable as explained in text and summarized in Figure 2.1 below. The independent variables of this study were; involvement of husbands and wives in CFA activities as well as gendered decision making powers and roles between husbands and wives during exploitation and sale of forest resources. By borrowing from the ideas and themes of the 'Typology of Participation' model, the nature and extent of involvement of husbands and wives in CFA activities was examined under the following themes: membership in the CFA (nominal participation), attendance of CFA meetings (passive participation), consultation during CFA meetings (consultative participation), reforestation activities (activity-specific participation), protection of the forest resources (active participation), and decision making over continuity with engagement in CFA activities (interactive participation). Guided by the Theory of FPE, decision making powers and roles of husbands and wives during exploitation and sale of forest resources as well as sharing of income earned from forest governance was explained under the themes of: decision making over use of forest resources, sharing of roles in

exploitation of forest resources, decision making over the sale of forest resources and decision to continue using forest resources.

Building from the existing literature on forest governance, the intervening variables included the factors that influenced the involvement of husbands and wives in CFA activities and use of forest resources. From the existing literature, socio-demographic characteristics such as age, household size, educational level, ethnic background, source of livelihood, income earned per month, distance from the forest boundary were identified as the main socio-demographic factors that influences engagement of husbands and wives in CFA activities and use of forest resources. Moreover, guided by 'Gender Box' theoretical framework, the main constraints to involvement of husbands and wives in CFA activities and use of forest resources were examined as follows: intra-household gender relations, time constraints, financial challenges, long distance from the forest boundary, insufficient forest information and training, and gender norms of behaviour.

Contingent upon the documented literature on use of forest resources, the dependent variable was conceived in terms of the implication of the intra-household gender relations in CFA activities and use of forest resources on livelihoods. The intra-household gender relations was conceptualized in terms of how husbands and wives collaborated (collaborative/balanced gender relations) or dominated (unbalanced/unequal gender relations) each other as they performed roles and made decisions during CFA activities and use of forest resources. The implication on livelihood was conceptualized in terms of whether husbands and wives gained access to food, livestock feeds, wood fuel, income and medicine when they both participated in forest governance as demonstrated in Figure 2.1 below.

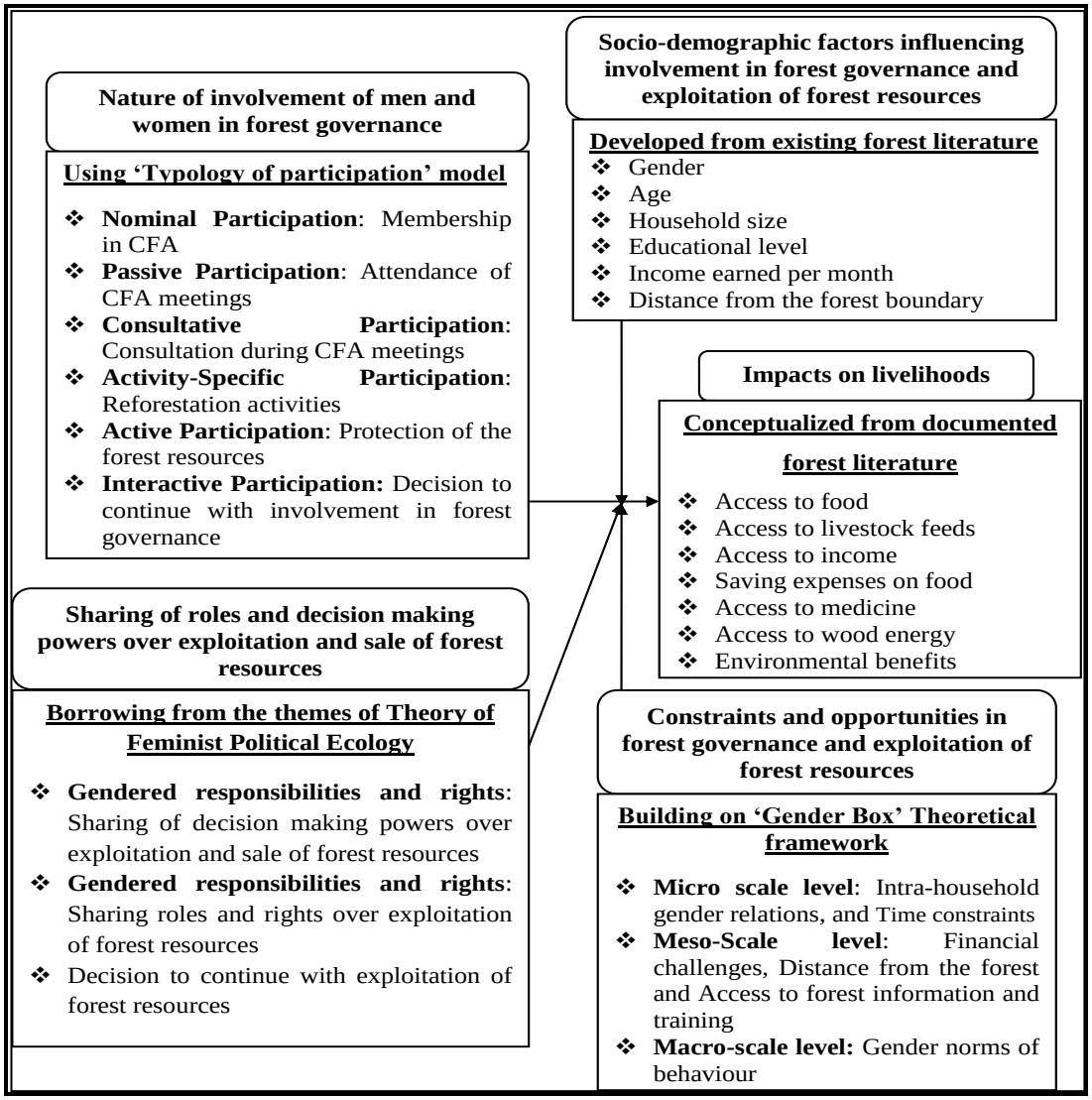

Figure: 2.1: Conceptual Framework of the study

Source: Author (2022)

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter explains the research philosophical underpinnings; the rationale for the selection of the research methods adopted as well as the procedures followed in sample size determination, data collection, analysis and presentation. The research techniques and tools adopted were critically analyzed with supporting evidence from previous studies. This chapter covers: research philosophy, research design and approach; target population; sampling frame and sample size; sampling techniques and procedures; research preparation and procedure; data collection instruments and procedures; data analysis techniques, procedures and presentation; quality data control and ethical considerations.

3.1 Research Philosophy

Some scholars advance that the philosophical orientation of the researcher influences the choice of the research approach adopted in conducting a research (Migiro & Magangi, 2011). This study was anchored on the premises and beliefs of the post-positivism research paradigm. Gamlen & McIntyre (2018) revealed that the research paradigm of post-positivism reiterates the significance of a theory in explaining social phenomena as opposed to only predicting (as advanced in the research paradigm of positivism) and interpreting (as argued in the research philosophy of interpretivism). Moreover, Gamlen & McIntyre (2018) pointed out that the main goal of post-positivist in social science is to develop theories that account for occurrence of phenomena rather than merely description of social reality. The choice of this research paradigm was based on the arguments of the three theoretical models: Typology of Participation model, Theory of Feminist Political Ecology and

'Gender Box' Theoretical model. The three theoretical approaches were used to account for the nature and extent of involvement of husbands and wives in CFA activities, sharing of decision making powers and roles between husbands and wives in use of forest resources as well as the constraints and opportunities for husbands and wives engaging in CFA activities and use of forest resources.

3.2 Research Approach and Design

Guided by the post-positivist research paradigm, the mixed-method research strategy was adopted in this study. The mixed method approach was adopted in this study because it promoted better understanding of quantitative data as well as qualitative data through the other (Gamlen & McIntyre, 2018; Migiro & Magangi, 2011). Also, the mixed-method approach was adopted due to the idea that it enables social scientists to comprehensively explain the diversity and complexity of human behaviour (Cohen *et al.*, 2007).

In addition, a concurrent triangulation research design was adopted in this study. The choice of this research design was informed by the virtue it facilitates the validation of the findings produced by the qualitative and quantitative data collection methods through the arguments produced by the other (Kroll & Neri, 2009). Manginsela (2016) used the triangulation research approach in her doctoral study based in Indonesia to examine gendered access to and control of forest resources in Indonesia because the mixed method (triangulation) approach *'increased the confidence'* in her research findings.

3.3 Target Population

In the present study, the target population included both male and female CFA members while the unit of analysis was the household. The CFA members were

included in this study because according to the Forest Act of Kenya (2005) the CFA is a community based forest organization that is legally mandated to collaborate with the Kenya Forest Service and other stakeholders in the protection, management, and conservation of forest resources. Moreover, it was presumed that the CFA members and their spouses had a wide scope of knowledge and experience with regard to information about forest management. For purposes of data validation, the key informants such as the CFA leaders, village elders, assistant chiefs, forest guards, and forest officers also formed part of target population.

3.4 Sampling Frame and Sample Size

3.4.1 Sampling frame

Due to absence of CFA membership list about the areal and gender distribution of the members of the Kiptaberr CFA, the selection of households in this study was based on all the households within the study sites (Kapterit and Kapcherop locations). According to the Kenya census report of 2019, the two locations had a total population of 13,516 persons residing within 1,402 households (GoK, 2019). Therefore, the 1,402 households formed the sampling frame of this study.

3.4.2 Household sample size

The household sample size was determined by the use of the formulae proposed by Yamane (1967). This formula has been applied by scholars in their doctoral studies. First, Kareri (2018) used the Yamane's formula to determine the household sample size of his study entitled: '*Land use changes and their impacts on wetlands in Loboi Plains Baringo County, Kenya'*. Second, Masayi (2021) adopted the Yamane's formula to determine the household sample size in her study on: '*Land use changes and their effects on Mt Elgon Forest Ecosystem, Kenya'*.

The Yamane's formula states that:

$$\mathbf{n = \frac{N}{1 + N(e)^2}}$$

Where n = sample size, N = population size (1402 households) and e = level of precision in this case (8.0 % = 0.08), therefore

$$n = \frac{1402}{1 + 1402\ (0.08)^2} = \frac{1402}{1 + 8.973}$$

$$n = \frac{1402}{9.973}$$

n = 140.58 households

Sample size (n) = 140 households were selected. The distribution of the households in the two locations and five sub-locations was as indicated in Table 3.1 below. From each of the 140 households sampled, the husband and wife were included in the sample summing up to a total of 280 respondents. The selection of a specific household was based on the following factors: (1) both the husband and wife must be members of the Kiptaberr CFA, (2) both the husband and wife should be present during the study period, and (3) both the husband and wife should be engaging in the exploitation of the forest resources.

Table 3.1: Households sampled in the two locations and five sub-locations

Location	**Sub-location**	**Calculation of households**	**Total sample size (Husband + wife)**
Kapterit	Kapterit	$\frac{267}{1402} \times 140 = 26.66 = 27$	27 x 2* = 54
	Kipsambach	$\frac{130}{1402} \times 140 = 12.98 = 13$	13 x 2* = 26
Kapcherop	Kipsero	$\frac{364}{1402} \times 140 = 36.35 = 36$	36 x 2* = 72
	Chebai	$\frac{250}{1402} \times 140 = 24.96 = 25$	25 x 2* = 50
	Yatoi	$\frac{391}{1402} \times 140 = 39.04 = 39$	39 x 2* = 78
Total		**140**	**280**

Source: Author's calculations (2020) 2* = husband + wife

3.4.3 Key informant sample size

In this study, 35 key informants that included: twenty (20) CFA members, seven (7) CFA leaders, two (2) village elders, two (2) assistant chiefs, two (2) forest guards, and two (2) Kenya Forest Service (KFS) officers were selected purposively. The twenty (20) CFA members included ten (10) men and ten (10) women that accounted for about ten percent (7 %) of the total household respondents (280). Among the 10 male key informants, there were two (2) PELIS members, two (2) grazers group members, two (2) bee-keepers, two (2) tree nursery establishment group members, and two (2) forest scouts. The 10 female key informants included three (3) PELIS members, one (1) bee-keeper, two (2) Tree Nursery Establishment group, two (2) firewood collectors and two (2) forest scouts. The selection of these twenty (20) CFA members was based on the argument that they had more understanding of the extent to which male and female CFA members engaged in Participatory Forest Management, used forest resources as well as the challenges and opportunities for men and women engaging in forest governance.

Further, according to the PFM guidelines of 2015, there are five (5) executive positions of the CFA namely: chairperson, vice chair person, secretary, Assistant secretary and the treasurer (KFS, 2015). Based on this documentation, seven (7) CFA leaders consisted of former CFA chair person (male), current CFA chair person (male), current vice chair person (female), former CFA secretary (male), current CFA secretary (male), former CFA treasurer (female), and current CFA treasurer (female) were sampled purposively. The selection of these CFA leaders was based on the premise that they understood: (a) the regulations and functions of the CFA, (b) the challenges facing men and women engaging in forest governance, (c)

possible solutions to the constraints that hinder the involvement in forest governance and use of forest resources.

In addition, two (2) village elders and two (2) assistant chiefs were included in this study since they were critical stakeholders in the mobilization of forest related meetings, acquisition and transmission of forest knowledge and information as well as enforcement of forest use rules. Further, two (2) forest guards based at Kipsambach Forest guard post and two (2) KFS officers based at Kapcherop Forest Station were selected because they were resourceful in providing information about: (a) the roles of the CFA in management and conservation of forest resources; (b) the implementation of forest regulations that guides access to forest resources and use of forest resources; and (c) understood the challenges hindering the involvement of CFA members in forest management and possible solutions.

The selection of these key respondents was informed by previous studies. Existing literature on forest management from Kenya indicate that some of the key respondents were the forest scouts, Forest User Group members, CFA leaders, forest officers, and village elders (Kimutai & Watanabe, 2016; Masayi, 2021; Mutune & Lund, 2016). In her doctoral study, Manginsela (2016) selected the following as the key respondents: village government leaders, herbalists, and forest farmers.

3.5 Sampling Techniques and Procedures

In line with the assumptions of the mixed method research approach, both probability and non-probability sampling techniques were used (Migiro & Magangi, 2011). The first level of sampling was done at the Forest block level where Kiptaber Forest block was purposively sampled. Secondly, Sengwer ward was purposively selected because it was located within the radius of five kilometres from the

boundary of Kiptaberr Forest Block of the Cherangany Hills Forest. This is also in line with the work of Masayi (2021) who purposively sampled the wards that were adjacent to Mount Elgon ecosystem since the residents of the area could disclose vital information about land use changes and the effects of land use changes on biodiversity and livelihoods of the adjacent communities.

The third level of sampling in this study was done at the location level where two locations (Kapterit location and Kapcherop location) were selected purposively because there was a forest guard post within Kapterit location and presence of a forest station within Kacherop location. The fourth level of sampling included that purposive sampling of the five sub-locations (Kipsambach, Kapterit, Kipsero, Chebai, and Yatoi). This method of sampling has been used by various scholars in their doctoral studies to compute the sample size at each sub-location (Kareri, 2018; Masayi, 2021).

With regard to selection of households with CFA members, systematic sampling technique was applied. At the household level, the first household was randomly selected from the first ten households from the CFA leaders in the study sites, the 6^{th} household was selected first and hence every 6^{th} subsequent household was selected. The households that were located in the range of between 0 and 5 kilometres along the transect walk was systematically sampled on either side of the paths. However, if the household heads or their spouses were absent during the study period then the next household was selected randomly.

3.6 Research Preparation and Procedure

During the research preparation, a reconnaissance was carried out in the month of April 2019 with the aim of familiarization with the forest adjacent communities,

local administrators and forest authorities. Other scholars also preceded their doctoral study with a pre-survey for the purposes of familiarization with the study area, making necessary logistical arrangements, gathering of background details and expanding their understanding of the research problem (Kareri, 2018; Masayi, 2021).

The semi-structured questionnaires were prepared by the researcher and handed to the research experts (supervisors) to assess the relevancy, adequacy and logical organization of the questions and the suggested corrections were made in the final questionnaire. This concurs substantially with the procedure followed by Masayi (2021) who revealed that she presented her questionnaire to the university supervisors for review.

Pre-testing of the questionnaires was done among twenty (20) CFA members within the Kapolet Forest Block in January 2020 whereby the ambiguous questions were re-phrased. This research procedure is similar to that followed by other scholars in their doctoral studies who piloted the data collection instruments so that they could refine the data collection tools in terms of language and cultural conformity (Kareri, 2018; Westervelt, 2017).

Moreover, there was a necessity to recruit research assistants because the researcher was a non-native of the study area. The four (4) research assistants (2 men and 2 women) were recruited based on; being residents in the study area, understood the study area very well, were able to speak the native language, Kiswahili and English languages fluently, were acceptable to the respondents, and had attained secondary school level of education. This is also in line with the steps followed by other scholars in their doctoral studies on natural resource management and use (Masayi, 2021; Nabanoga, 2005; Westervelt, 2017). The two male and two female research

assistants were trained for three days on how to administer the questionnaires and answer the questions from the respondents in a polite and persuasive manner. This is also in line with the research procedure of doctoral study of other researchers who trained the research assistants on questionnaire items and how to administer the questionnaires (Kareri, 2018; Westervelt, 2017).

In conformity with the assumptions of the concurrent triangulation research design during data collection (Kroll & Neri, 2009), the research assistants administered the questionnaires to the respondents while the researcher conducted all the interviews. In addition, one of the research assistant acted as the translator during the interviews among the illiterate respondents. The researcher received the duly filled questionnaires at the end of every day where the key respondents or emerging issues that required further probing from the respondents were identified. During the data collection, the village elders acted as the tour guides in the area.

3.7 Data Collection Methods and Procedure

3.7.1 Semi-structured questionnaires

Building on assumptions of the mixed-method research approach, semi-structured questionnaires were administered to the household sampled to collect data because it enhanced the generation of both quantitative and qualitative data that was imperative in understanding the research problem (Migiro & Magangi, 2011; Nkengla, 2014; Westervelt, 2017). The questionnaire was sub-divided into five sections and used to collect data on the following. The first section of the questionnaire constituted questions that were meant to collect data on the socio-economic characteristics of household respondents. The second section of the questionnaire included questions that were mean to collect data on the nature and extent of involvement of husbands and wives in forest governance (CFA activities).

The third section of the questionnaire comprised of questions that were designed to collect data on decision making powers and roles between husbands and wives who engage in the exploitation and sale of forest resources. The fourth section of the questionnaire encompassed questions used to collect data on the implications of gender relations in forest governance and use of forest resources on livelihoods. The fifth section of the questionnaire included questions meant to gather data on the constraints and opportunities to the involvement of husbands and wives in forest governance and use of forest resources. The questionnaire constituted both close-ended questions and open-ended questions which are in line with the mixed-method approach (Migiro & Magangi, 2011). The questionnaires were administered to 280 respondents (140 male and 140 female) between January and April, 2021 by the research assistants under the guidance of the researcher.

Moreover, the questionnaires were mainly administered between 8.00 am and 5.00 p.m. from Monday to Friday because this is generally the conventional working hours and days in Kenya. If the respondents were found very busy performing their domestic tasks, then the data collection was rescheduled to another time. The literate respondents were able to fill the semi-structured questionnaires on their own while the illiterate respondents that consisted of thirteen (13) male respondents and fifteen (15) female respondents were assisted to fill the questionnaires by the research assistants. Moreover, every questionnaire was filled at an average of between twenty to twenty five minutes. In most cases the questionnaires were filled under a tree while sometimes in the house at the convenience of the respondent or prevailing weather condition.

3.7.2 Interviews

Interviews were conducted among the thirty five (35) key respondents that were selected purposively. The respondents were interviewed to collect qualitative data on: nature and extent of the involvement of husbands and wives in CFA activities, intra-household decision making powers and roles on use of forest resources, implications of intra-household gendered involvement in CFA activities and use of forest resources on livelihoods as well as challenges and opportunities for husbands and wives engaging in CFA activities and use of forest resources.

These interviews were mainly conducted between 8.00 a.m. to 5.00 p.m. mainly because this is generally the conventional working hours and days in Kenya. The household key respondents were interviewed under a tree or in the house depending on the prevailing weather condition while the other respondents (forest guards, forest officers, and assistant chiefs) were interviewed at their place of work. This concurs with the doctoral study by Nkengla (2014) who noted that she conducted her interviews under a tree shade within the homesteads of the key informants. On average, most of the household interviews lasted between one and two hours. During the collection of qualitative data for her doctoral research within Loita Forest in Kenya, Westervelt (2017) conducted interviews that lasted between seventy (70) and eight five (85) minutes.

3.8 Data Analysis Techniques, Procedures and Presentation

As argued in the mixed method research approach, the collected data was analyzed using quantitative and qualitative data analysis techniques (Migiro & Magangi, 2011). Guided by the level of measurement, the quantitative data analysis was conducted based on the following four objectives:

Within the first objective, variables measured on interval scale such as membership length in the Community Forest Association was analyzed using mean and standard deviation. Moreover, the data variables measured on nominal scale such as payment of CFA subscription fees, venue of CFA meetings, time and day of CFA meetings, and decision to continue with engagement in CFA activities were analysed using frequency counts and percentages. In addition, the data variables measured on ordinal scale such as frequency of attending CFA meetings, frequency to which husbands and wives were consulted by CFA leaders, extent to which both male and female spouses engage in reforestation activities, extent to which male and female spouses engage in forest protection activities were analyzed using frequency counts, percentages and mean.

Further, the statements on the frequency of consultation by the CFA leaders about CFA activities, a Likert scale of 4 -points where: 1 = Never (N), 2 = Rarely (R), 3 = Sometimes (S), and 4 = Always (A) were used. The mean score value for the statements on frequency of consultation of 1.00 - 2.00 indicates 'Rarely', 2.00 – 3.00 depicts 'Sometimes' and 2.00 - 3.00 implies 'Always'. The extent of engagement in the reforestation activities and forest protection was assessed on 4 – point Likert scale where: 1 = Not at all (NA), 2 = Less Extent (LE), 3 = Some Extent (SE), and 4 = Great Extent (GE). The analysis of the 4 – point Likert scale was as follows: mean score value of 1.00 - 2.00 implies 'Minimal Extent', 2.00 – 3.00 indicates 'Substantial Extent' and 3.00 - 4.00 indicates 'Great Extent'. Moreover, the statements on the decision to continue engaging in forest governance were examined as follows: 1 = No and 2 = Yes and were analyzed using frequency counts and percentages. The qualitative data that includes the assertions of key informants about

the involvement of men and women in forest governance were transcribed and analyzed thematically (Cohen *et al*., 2007).

With regard to the second objective, data variables measured on nominal scale such as gender sharing of intra-household decision making powers over the sale of forest products and gendered decision to continue using forest resources were analyzed using frequency counts and percentages. Moreover, the data variables measured on ordinal scale such as extent to which spouses engaged jointly in household decision making over exploitation of forest resources and extent to which spouses shared responsibilities and rights over exploitation of forest resources were analyzed using frequency counts, percentages and mean. In addition, the decision making over the use of forest resources and sharing of responsibilities and rights over the use of forest resources was assessed on 4 – point Likert scale of 1-4 where: 1 = Not at all (NA), 2 = Less Extent (LE), 3 = Some Extent (SE), and 4 = Great Extent (GE). The analysis of the 4 - point Likert scale was as follows: mean score value of 1.00 - 2.00 implies 'Minimal Extent', 2.00 – 3.00 indicates 'Substantial Extent' and 3.00 - 4.00 indicates 'Great Extent'. The qualitative data that focuses on the perceptions of key informants about the use of forest resources were transcribed and analyzed in form of themes (Cohen *et al*., 2007).

Concerning the third objective, the data variables measured on nominal scale such as sharing and use of money from forest governance and sale of forest product were analyzed using frequency counts and percentages. Also, the data variables measured on likert scale (ordinal scale) such as implication of gendered involvement in forest governance and use of forest resources on access to livelihood assets were analyzed using frequency counts, percentages and mean. In this study, the likert scale analyses for the statements on level of agreement was based on the recommendations of

Carifio & Rocco (2007) as follows: mean score ranges of 1.0 - 1.8 indicates 'Strongly Disagree', 1.8 - 2.6 implies 'Disagree', 2.6 - 3.4 demonstrates 'Neutral', 3.4 - 4.2 infers 'Agree' and mean score of 4.2 - 5.0 reveals 'Strongly Agree'. The qualitative data in form of views from the key informants about the implications of involvement of men and women in forest governance and use of forest resources on livelihoods were transcribed and analyzed thematically (Cohen *et al*., 2007).

The fourth objective was to assess the constraints and opportunities for husbands and wives engaging in forest governance and use of forest resources within Cherangany Hills Forest. The data variables measured on ordinal scale such as level of agreement to the statements that were related to how intra-household gender relations, time constraints, financial constraints, distance constraints, inadequate forest knowledge and training, and gender norms of behaviour hindered their involvement in forest governance were analyzed using frequency counts, percentages and mean. The statements on level of agreement were determined on 5-point Likert scale as follows: 1 = Strongly Disagree (SD), 2 = Disagree (D), 3 = Neutral (N), 4 = Agree (A) and 5 = Strongly Agree (SA). Also, the likert scale analyses for the statements on level of agreement was based on the recommendations of Carifio & Rocco (2007) as follows: mean score ranges of 1.0 - 1.8 indicates 'Strongly Disagree', 1.8 - 2.6 implies 'Disagree', 2.6 - 3.4 demonstrates 'Neutral', 3.4 - 4.2 infers 'Agree' and mean score of 4.2 - 5.0 reveals 'Strongly Agree'. The qualitative data from key informants about the challenges and opportunities available to involvement of husbands and wives in forest governance and use of forest resources were transcribed and analyzed thematically (Cohen *et al*., 2007).

With regard to data display and presentation, quantitative data was presented in form of frequency tables, percentages, and graphs. The frequency tables were prepared by

use of Microsoft word 2013 while the bar graphs were generated by use of Microsoft Excel 2013. Some of the interviews were presented in narrative format where the assertions of the interviewees were directly quoted while other interviews were paraphrased. This was done by categorizing the data into various themes for purposes of identifying main content.

3.9 Quality Data Control

3.9.1 Validity

Kothari (2004) argued that validity of a data instrument shows the degree to which a questionnaire and an interview schedule measures what it is supposed to measure. According to him, content validity is the extent to which a questionnaire or an interview schedule gives sufficient coverage of the topic under consideration. To ensure content validity is achieved, the questionnaire and the interview schedule were given to the two university supervisors who are experts in the subject matter. Also, there was pre-testing of the questionnaire to establish the scope of the questionnaires. Thereafter, corrections were made and the revised version of the questionnaire and the interview schedules were used. Some scholars have also shared the research instruments with their university supervisors as well as pre-tested their questionnaires to achieve content validity of their research instruments (Kareri, 2018; Masayi, 2021).

3.9.2 Reliability

According to Kothari (2004) a data collection instrument in this case a questionnaire is said to be reliable if it gives consistent results even when used several times. When dealing with reliability of the measuring instrument (questionnaire or interview schedule) then; stability and equivalence aspects must be put into consideration. Cohen *et al* (2007) revealed that internal consistency of a questionnaire can be found

in the Alpha coefficient of reliability. Therefore, a coefficient Alpha of above 0.7 is deemed reliable to test the reliability of the questionnaires and this was calculated to test the reliability among multi-item scales. Also, the research assistants were adequately trained on the research objectives and how to fill the questionnaires so that the errors that could be introduced by different researchers were reduced (Kothari, 2004).

3.10 Ethical Concerns of this Study

The authorization to conduct the study was obtained from National Commission for Science Technology and Innovations (NACOSTI) to conduct the research within Elgeyo Marakwet County. During the data collection, the respondents were given sufficient details about the objective of the study, potential benefits of the study, the process that would be followed during data collection and how their privacy would be guaranteed after providing the information. In the present study, the respondents were given the freedom to choose whether to participate in the study or to withdraw their participation without victimization or condemnation. There was no form of reward for the respondents that participated in this study after giving out the information but only verbal appreciation. The questionnaires were labeled using Arabic numbers for purposes of identification so that the respondents remained anonymous. For the respondents that were more willing to give their names, then pseudonyms were used in the final writing of the thesis and future publications.

When sensitive information about illegal access to forest resources was given, then this information remained confidential between the researcher and the respondents. In instances where photographs taken contained information that revealed the identity of the respondents or their place of residence, then permission was sought

first before they are included in the final thesis document or journal publications. Moreover, the cultural beliefs of the respondents were respected and sensitive questions about the performance of traditional cultural rites were not asked. The sources of secondary data such as government reports, journal articles, theses, and periodicals were properly acknowledged and included in the reference section. Furthermore, the individuals and organizations that offered moral, academic and financial support for the successful completion of the thesis, their effort were revered and appreciated in the acknowledgement section of the thesis. On publications of the research findings in form of journal articles, the conflict of interest if any was declared.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.0 Introduction

This chapter presents the results and discussions of the study in five sections. The first section indicates the socio-demographic profile of the respondents. Section two of this chapter deals with the nature and extent of involvement of husbands and wives in CFA activities. The third section of this study focuses on the sharing of roles and decision making between husbands and wives over the use of forest resources. Section four of this chapter covers the implications of intra-household gendered decision making powers and roles in CFA activities and use of forest resources on livelihoods. The fifth section of this study includes the constraints and opportunities for husbands and wives engaging in CFA activities and use of forest resources.

4.1 Socio-demographic Profile of Respondents

Previous studies on forest governance demonstrate that the age of an individual influences their ability to engage in forest management and conservation activities (Musyoki *et al*., 2013). The results presented in Table 4.1 show that a majority of the male respondents (n = 56, 20.0 %) and female respondents (n = 54, 19.3 %) were aged between 40 and 49 years while a few of the male respondents (n = 15, 5.4 %) and female respondents (n = 17, 6.1 %) were aged between 20 and 29 years. The overall mean age of the respondents was 40.9 ± 3.4 years, the mean age of the male respondents was 43.4 ± 3.9 years and the average age of the female respondents was 38.6 ± 3.2 years.

Table 4.1: Socio-demographic characteristics of household respondents

Demographic characteristic	Male		Female		Total	
	n	%	N	%	n	%
Age group (years)						
20 - 29	15	5.4	17	6.1	32	11.5
30 - 39	42	15.0	51	18.2	93	33.2
40 - 49	56	20.0	54	19.3	110	39.3
50 – 59	27	9.6	18	6.4	45	16.0
Mean of age	43.4 ± 3.9		38.6 ± 3.2		40.9 ± 3.4	
Household size						
2	16	5.7	16	5.7	32	11.4
3	38	13.61	38	13.6	76	27.2
4	51	8.2	51	18.2	102	36.4
More than 4	35	12.5	35	12.5	70	25.0
Ethnic Background						
Sengwer	81	28.9	93	33.2	174	62.1
Marakwet	37	13.2	29	10.4	66	23.6
Others	22	7.9	18	6.4	40	14.3
Highest educational level						
Primary	86	30.71	98	35.0	184	65.7
Secondary	33	1.8	20	7.1	53	18.9
Tertiary	5	1.8	3	1.1	8	2.9
Non-Formal Education	16	5.7	19	6.8	35	12.5
Source of livelihood						
Farming	134	47.9	140	50.0	274	97.9
Selling of forest products	72	25.71	66	23.6	138	49.3
Wage labour	29	0.4	42	15.0	71	25.4
Transport services	31	11.1	0	0.0	31	11.1
Shop business	7	2.5	2	0.7	9	3.2
Income per month (Ksh)						
< 10000	68	24.3	84	30.0	152	54.3
10001-20000	46	16.4	41	14.6	87	31.1
20001-30000	17	6.1	15	5.4	32	11.5
>30000	9	3.2	0	0.0	9	3.2
Mean income per month (Ksh)	13860 ± 530		11910 ± 470		12840 ± 490	
Homestead distance to forest (Km)						
0.1 - 1.0	62	22.1	62	22.1	124	44.3
1.1 - 2.0	38	13.6	38	13.6	76	27.2
2.1 - 3.0	26	9.3	26	9.3	52	18.6
3.1 - 4.0	11	3.9	11	3.9	22	7.8
4.1 - 5.0	3	1.1	3	1.1	6	2.2
Mean distance to forest (Km)			1.48 ± 0.23			

Source: Field survey data (2021)

As demonstrated in Figure 4.1, a simple majority of the male respondents (n = 66, 23.6 %) and female respondents (n = 58, 20.7 %) had been members of the CFA for between six and eight years (joined the CFA between 2012 and 2014). On the other hand, a few of the male respondents (n = 4, 1.4 %) and female respondents (n = 5, 1.8 %) had been members of the CFA for less than two years (joined the CFA between 2019 and 2020). The mean length of CFA membership for male respondents was 5.4 ± 0.4 years while that of the female respondents was 5.1 ± 0.6 years.

Existing literature points out that the household size determines the demand for forest products, the need to join forest management organizations and motivation to engage in forest conservation initiatives (Musyoki *et al.*, 2013; Okumu, 2017). Table 4.1 reveals that a majority of respondents (n = 102, 36.4 %) noted that their households had four members while a few of the respondents (n = 32, 11.4 %) said that their households had two members. This finding is in line with the Kenya Population census report 2019 which documents that the average household size within Marakwet West sub-county was 4.6 persons (GoK, 2019).

Documented evidence demonstrates that the cultural background of a person has an influence on their choice of economic activity and the values they attach to the natural environment (Okumu, 2017). Table 4.1 demonstrate that a majority of the male respondents (n = 81, 28.9 %) and female respondents (n = 93, 33.2 %) were from the Sengwer tribe, 37 (13.2 %) of the male respondents and 29 (10.4 %) of the female respondents were from the Marakwet sub-tribe while 22 (7.9 %) of the male respondents and 18 (6.4 %) of the female respondents were from other tribes such as Keiyo, Pokot, Tugen and Luhya. A majority of the respondents were from the

Sengwer tribe because it is the pre-dominant indigenous community adjacent to the Cherangany Hills Forest (Rotich, 2019).

Several scholars indicate that education level of a forest organization member significantly influences their level of participation in not only forest meetings but also drafting of the forest management plans (Mogoi *et al.*, 2012; Okumu, 2017). From Table 4.1, a majority of the male respondents (n = 86, 30.7 %) and female respondents (n = 98, 35.0 %) had primary education while a few of the male respondents (n = 5, 1.8 %) and female respondents (n = 3, 1.1 %) had tertiary education. Rozaki *et al* (2021) confirms that a majority of the respondents in his study conducted in Indonesia had elementary education level because most of the respondents were living in the remote mountainous regions and hence were less interested in furthering their education.

In the present study, it was important to examine the source of livelihood of the respondents since it has strong links with the availability of time to participate in forest management (Mashapa *et al.,* 2020; Onzere *et al.,* 2020). Table 4.1 highlights that a majority of the male respondents (n = 134, 47.9 %) and female respondents (n = 140, 50.0 %) engaged in farming activities. This revelation reflects the findings of the study conducted by Rotich (2019) in Embobut Forest Reserve of Cherangany Hills where most of the respondents engaged in mixed farming. A few of the respondents (n = 9, 3.2 %) operated shop business as a livelihood activity within their compounds or at the market places.

Documented evidence demonstrates that the income level of the household determines the extent to which men and women are likely to engage in management, conservation and use of forest resources (Ekanayake *et al*., 2021). Table 4.1 shows

that a majority of the male respondents (n = 68, 24.3 %) and female respondents (n = 84, 30.0 %) earned less than Ksh 10,000 while a few of the male respondents (n = 9, 3.2 %) and none of the female respondents (0.0 %) earned more than Ksh. 30,000 per month. The mean monthly income for men was Ksh 13,860 ± 530 and the mean income per month for women was Ksh 11,910 ± 470. Existing literature indicates that 57 per cent of the residents in the county of Elgeyo Marakwet are below the poverty line which is slightly high in relation to the national poverty level of 46 percent (County Government of Elgeyo Marakwet Plan, 2013). Further, the overall mean monthly income was Ksh 12,840 ± 490 which differs with the scholarly work of Okumu (2017) who found out that the mean household monthly income was estimated to be Ksh 13,492 in his research carried out among the communities residing adjacent to Mau Forest in Kenya. This could be attributed to differences in the economic status and livelihood activities that the residents in the two regions engage in.

Studies affirm that the distance from the forest boundary influences the decision to join forest organizations since the longer the distance from the forest boundary the higher the time and transport costs incurred when engaging in forest management (Musyoki *et al*., 2013). Table 4.1 illustrates that a majority of the respondents (n = 124, 44.3 %) reported that their homesteads were located between 0.1 and 1.0 kilometres from the forest boundary while a few of the respondents (n = 6, 2.2 %) noted that their homesteads were found between 4.1 and 5.0 kilometres from the forest boundary. In addition, the mean homestead distance from the forest boundary was 1.48 ± 0.23 kilometres which is in line with the findings of Okumu (2017) who found out that the average homestead distance from the forest edge of the Mau forest was approximately 1.4 kilometres.

4.2 Nature and Extent of Involvement of Husbands and Wives in Community Forest Association activities

The first objective of this study examines the nature and extent of involvement of husbands and wives in Community Forest Association activities within the Cherangany Hills Forest, Kenya. Borrowing from the 'Typology of Participation' model as explained under the theoretical framework and conceptual sections of this study, the nature and extent of involvement of husbands and wives in CFA activities was examined under the following sub-themes: length of membership in the CFA, payment of CFA fees, frequency of attending CFA meetings, venue of CFA meetings, time of attending CFA meetings, consultation between CFA members and CFA leaders, reforestation activities, forest protection, and decision to continue with involvement in CFA activities as discussed below.

4.2.1 Length of membership in the Community Forest Association

As proposed by Bina Agarwal in her 'Typology of Participation' model, nominal level of participation in this study was conceptualized in terms of length of membership of husbands and wives in the CFA. To establish the length of membership in the CFA, the respondents were asked to respond to the question: '*How long have you been a member of the Community Forest Association*?' The responses were analyzed and presented as indicated in Figure 4.1 below.

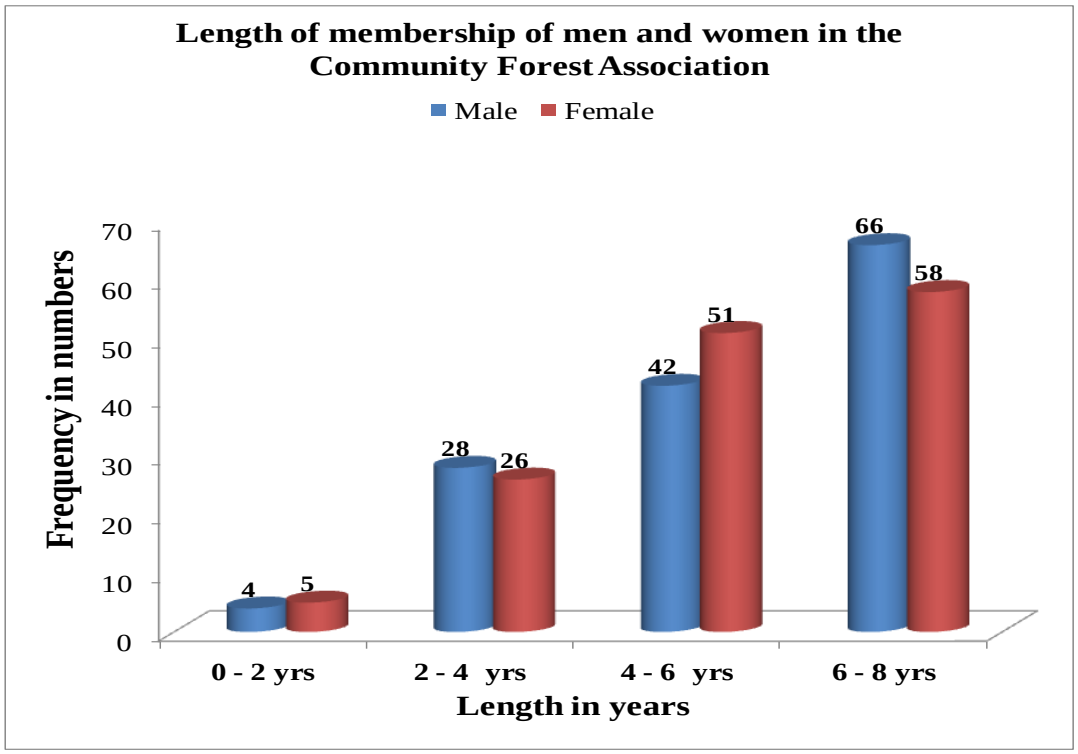

Figure 4.1: Length of membership in Community Forest Association
Source: Field survey (2021)

As demonstrated in Figure 4.1, a simple majority of the male respondents (n = 66, 23.6 %) and female respondents (n = 58, 20.7 %) had been members of the CFA for between six and eight years (joined the CFA between 2012 and 2014). On the other hand, a few of the male respondents (n = 4, 1.4 %) and female respondents (n = 5, 1.8 %) had been members of the CFA for less than two years (joined the CFA between 2019 and 2020). The mean length of CFA membership for male respondents was 5.4 ± 0.4 years while that of the female respondents was 5.1 ± 0.6 years. This mean length difference implies that the husbands indicated longer duration of 'Nominal' level of participation in forest governance compared to the wives.

Through interviews, it was noted that some of the men who were founder members of the CFA convinced their female spouses to join the CFA. It was also revealed through interviews that a few of the women who were founder members of CFA had

persuaded their husbands to join the CFA so that they could gain access to forest resources. Moreover, it is clear from Figure 4.1 that the number of men and women who were joining the CFA was reducing over time. While accounting for the reasons as to why the number of men and women joining the CFA was reducing over time, male key respondent number 8 when probed reiterated that:

> '*I have been a member of this CFA for the last eight years. When I joined this association in 2012 the number of men and women joining the CFA was very high due to the high level of public awareness about Participatory Forest Management as well as sufficient financial support from Non-Governmental Organizations. But, with time, the number of both men and women joining the association has been reducing every year. This is generally because the financial support for the CFA has dwindled and the public awareness has been very low*.'[KII-8, 2021]

The assertions above indicate that the proportion of men and women joining the CFA has been on the down turn due to low financial support for the CFA as well as low level of public awareness. This concurs substantially with the scholarly writing of Mutune *et al* (2015) who revealed that some of the members of the CFA were passive participants in the forest group's activities in Sururu and Eburu forest reserves within the Mau Forest in Kenya due to lack of information about how to join the CFA and roles of the CFA.

4.2.2 Payment of CFA subscription fees

According to PFM guidelines of 2015, a CFA member may be deregistered if his or her monthly subscription falls into arrears for more than six months (KFS, 2015). The respondents were asked to respond to the question: *Who within the household usually pay the CFA subscription fees*?' The results were analyzed and presented in Table 4.2 as shown below.

Table 4.2: Household members that pay the CFA subscription fees

Who usually pays the CFA fees	Frequency	Percent (%)
Both husband and wife	136	48.6
Husband only	74	26.4
Wife only	48	17.1
Other household members	22	7.9
Total	280	100

Source: Field survey (2021)

Table 4.2 highlights that a majority of the respondents (n = 136, 48.6 %) observed that both the husbands and wives shared the role of paying the CFA subscription fees while a few of the respondents (n = 22, 7.9 %) noted that other household members paid the CFA subscription fees. This finding emphasizes the idea that both husbands and wives engaged in forest governance at 'Nominal' level during the payment of the CFA subscription fees in most of the households of the CFA members. Moreover, there was no gendered nature and extent of 'Nominal' participation of husbands and wives in forest governance during the payment of the CFA subscription fees within a few of the households because other household members such as parents and siblings paid the CFA subscription fees on their behalf.

While explaining how husbands and wives collaborated with each other during the paying of the CFA subscription fees at the household level, male key respondent number 1 opined that: '*I usually pay the CFA subscription fees for the household. Sometimes, when I do not have the money my wife pays*.' This finding affirms that both male and female CFA members reported 'Nominal' nature and extent of participation within some of the households through payment of CFA fees.

However, female key respondent number 12 revealed that: '*My husband does not pay the CFA subscription fees for the household whether he has the money or not because I am the one who always pay.'* The opinion of the female respondent above

highlights that within other households the female CFA members were the only ones who engaged in forest governance at 'Nominal' level through payment of CFA fees.

Through interviews, it was revealed that the CFA subscription fee was used to: (i) finance the CFA programmes especially the establishment and maintenance of tree nurseries, (ii) facilitate the organization of CFA meetings especially communicating to members about upcoming meetings and other CFA programmes, and (iii) motivate the forest scouts by fuelling the motorcycles that were used as a means of transport during forest patrols and reporting of illegal activities that occur within the forest. This finding supports the academic documentation of Mogoi *et al* (2012) and Ombogoh *et al* (2022) who found out that the CFA subscription fees was used to operate the CFA offices, pay salaries of the hired personnel as well as establish and maintain tree nurseries within the state-managed forests such as Mt Elgon Forest in Kenya.

4.2.3 Frequency of attending CFA meetings

In her 'Typology of Participation' Model, Agarwal (2001; 2010) argues that 'Passive' level of participation in forest management was indicated by attendance of forest meetings. Moreover, studies confirm that CFA members attended forest related meetings in Kenya (Coleman & Mwangi, 2013; Obonyo & Mogoi, 2009). The respondents were asked: '*How often do you attend the CFA meetings*?' The responses were analyzed and presented as shown in Figure 4.2.

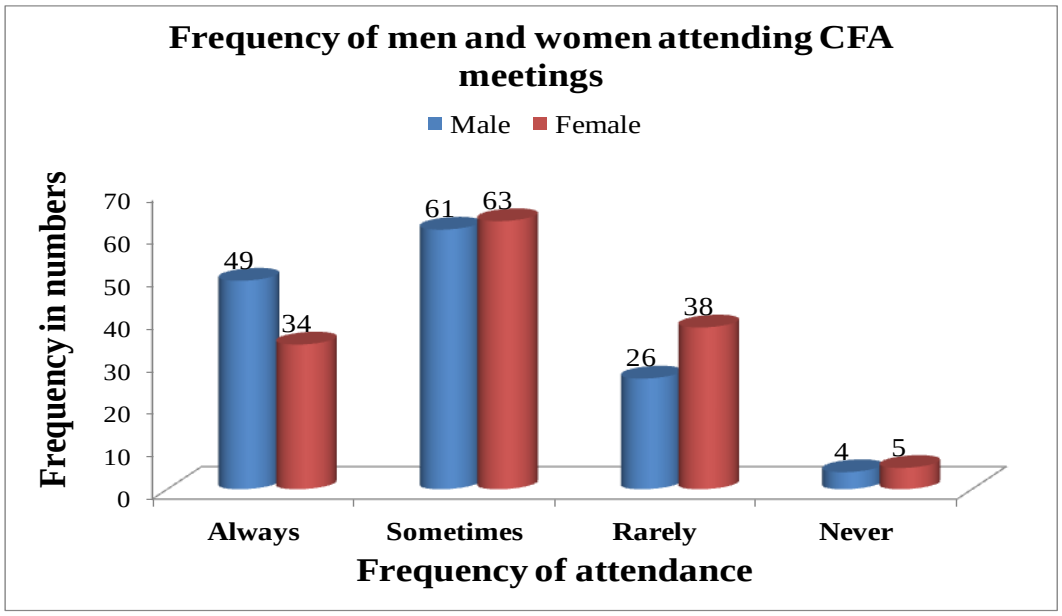

Figure 4.2: Frequency of attending CFA meetings Source: Field survey (2021)

As highlighted in Figure 4.2, 49 (17.5 %) of the male respondents while 34 (12.1 %) of the female respondents reported that they 'Always' attended the CFA meetings. This indicates that the husbands of CFA members were more likely than wives of CFA members to always engage at 'Passive' level in forest governance through attendance of CFA meetings. The results presented in Figure 4.2 illustrated that 61 (21.8 %) of the male respondents while 63 (22.5 %) of the female respondents said that they 'Sometimes' attended the CFA meetings. This reinforces the argument that more women than men occasionally engaged in forest governance at a 'Passive' level through attendance of CFA meetings.

From Figure 4.2, it is clear that 26 (9.3 %) of the male respondents and 38 (13.6 %) of the female respondents 'Rarely' attended the CFA meetings. This implies that a slightly higher number of women than men seldom participated in forest governance at 'Passive level' through attendance of CFA meetings. According to Figure 4.2, 3 (1.4 %) of the male respondents while 5 (1.8 %) of the female respondents observed that they have 'Never' attended the CFA meetings. This implies that a slightly high

number of women than men had never participated in forest governance at 'Passive level' through attendance of the CFA meetings.

During the interviews, some of the reasons as to why husbands and wives often attended the CFA meetings were established. For instance, male key respondent number 5 when interviewed he affirmed that:

> '*I always attend the CFA meetings because of three reasons. First, since I am the secretary of our CFA and therefore I must attend the meetings to write the minutes of the CFA meetings. Second, one of the CFA by-laws states that if you fail to attend the CFA meetings for three consecutive times without permission you are likely to be deregistered. Third, another CFA by-law reiterates that if you fail to attend the meeting on time you are required to pay a fine of between Ksh 20 and Ksh 50.'*[KII-5, 2021]

The views presented above emphasizes that some CFA members always attended the CFA meetings mainly because they were CFA leaders and wanted to abide by the stipulated by-laws of the CFA. This finding supports the revelations of a study conducted by Espinosa (2010) who noted that some women attended the community wildlife meetings in Brazil because absenteeism during these meetings attracted a fine.

While giving divergent reasons for always attending CFA meetings, female key respondent number 2 opined that:

> '*I always attend most of the CFA meetings because I usually receive the messages about the meeting time and venue. Further, I am encouraged by my husband, friends and neighbours to attend. When my husband and neighbours are busy they encourage me to attend so that I can brief them of what transpired during these meetings.'* [KII-2, 2021]

The assertions above reiterates that some of the reasons as to why the wives of CFA members always participated in forest governance at 'Passive' level through attendance of the CFA meetings because they had received the invitation messages

for the forest meetings and had received moral support from their spouses, friends and neighbours.

4.2.4 Venue of CFA meetings

The spatial nature and extent of involvement of men and women in the forest governance was assessed in terms of the venue of the CFA meetings. The respondents were asked to respond to the question: '*Where do you usually attend the CFA meetings?*' The responses were analyzed and presented as shown in Figure 4.3.

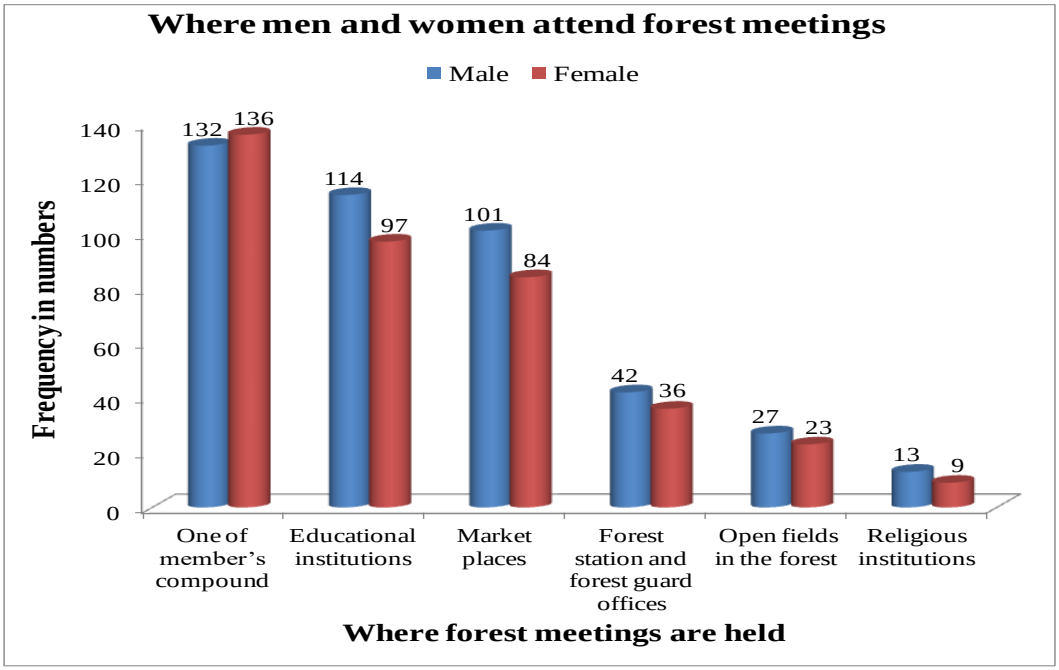

Figure 4.3: Venue of CFA meetings Source: Field Survey (2021)
***Multiple responses apply**

As highlighted in Figure 4.3, 132 (47.1 %) of the male respondents while 136 (48.6 %) of the female respondents attended the CFA meetings that were held within one of the member's compound. While accounting for this result, most of the male and female CFA members argued that they participated in forest governance at 'Passive level' through attendance of CFA meetings within one of the member's compound since it was nearer their households and therefore no transport cost was incurred. This finding supports the scholarly writing of Samndong (2018) who observed that

some of the forest related meetings were conducted within the residence of the local leaders in the DRC. In their study conducted in Uganda, Banana *et al* (2012) corroborates that women always attended forest meetings that were held within their locality because it did not require travelling.

The results presented in Figure 4.3 show that 114 (40.7 %) of the male respondents while 97 (34.6 %) of the female respondents attended the CFA meetings that were held within the educational institutions especially the public primary schools. It was revealed through interviews that most of the men and women who engaged in forest governance at 'Passive' level through attendance of CFA meetings that were held within the primary school grounds were members of PELIS forest user group. This revelation is in line with the academic work of Samndong (2018) who posit that some of the forest meetings in the DRC were held within the village schools.

The results in Figure 4.3 underlines that 101 (36.1 %) of the male respondents while 84 (30.0 %) of the female respondents attended the CFA meetings that were held within the market places. Through in-depth interviews, it was established that some of the forest related meetings were held at the following market places: Kapcherop Township, Kapterit market centre, and Kipsero market centre. Some respondents pointed out that the wives of CFA members were less likely to attend these forest related meetings because they were restricted by household gender division of labour.

As indicated in Figure 4.3, 42 (15.0 %) of the male respondents while 36 (12.9 %) of the female respondents attended the forest related meetings that were held within the CFA offices (located within the Cherangany Hills forest station at Kapcherop Township) as well as forest guard post (at Kipsambach forest guard post). It can be

inferred that more husbands than wives of CFA members participated in forest governance at ‘Passive’ level through attendance of forest related meetings held within the forest station and forest guard posts. This gender asymmetry in attendance of the meetings was mainly due to gendered ascribed roles which restricted the mobility of women within the public spaces located far away from their homes.

Figure 4.3 shows that 27 (9.6 %) of the male respondents while 23 (8.2 %) of the female respondents attended the forest meetings that were held within the glades (open spaces within the forest that are mainly covered with grass). This result highlights that more husbands than wives of CFA members engaged in forest governance at ‘Passive’ participation through attendance of forest related meetings that were held within the open fields in the forest. Through interviews, it was established that the forest related meetings that were held within the open fields in the forest were mainly attended by members of the Forest User Groups such as grazers who were mainly men.

The results presented in Figure 4.3 demonstrate that 13 (4.6 %) of the male respondents while 9 (3.2 %) of the female respondents attended the forest related meetings that were held within the religious institutions’ compound especially the churches. This finding indicates that there was negligible gender disparity at ‘Passive’ level of engagement in forest governance through attendance of CFA meetings that were held within the religious compounds. In his study based in the DRC, Samndong (2018) asserts that some of the forest related meetings were held within the church compounds.

4.2.5 Time of CFA meetings

The temporal nature and extent to which husbands and wives engaged in forest governance was assessed in terms of the time and day when male and female CFA members attended forest meetings. The respondents were asked: '*At what time and day do you usually attend Community Forest Association meetings?'* The responses were analyzed and presented as shown in Figure 4.4 below.

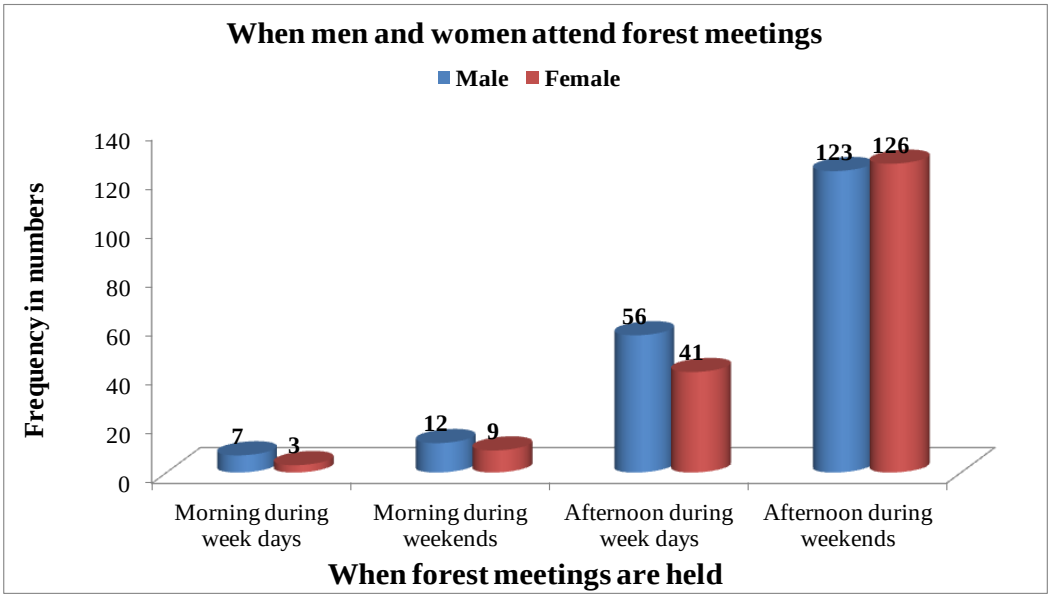

Figure 4.4: When husbands and wives attend CFA meetings Source: Field Survey (2021) *Multiple Responses Apply

From Figure 4.4, 7 (2.5 %) of the male respondents and 3 (1.1 %) of the female respondents attended CFA meetings that were held during morning hours of week days. This finding affirms that husbands were more likely than wives to be involved in forest governance at 'Passive' level through attendance of CFA meetings during the morning hours of weekdays. It was confirmed through interviews that the CFA meetings that were held during this time were mainly attended by the CFA leaders. The gender asymmetry in attendance of CFA meetings during the morning hours of weekdays was due to the argument that there were very few female CFA leaders. To ascertain the type of forest related meetings that were held during morning hours, male key respondent number 4 asserted that:

> '*Most of the CFA meetings that were held in the morning from about 8.30 am were based on whether there was an urgent report that was needed by the Kenya Forest Service or when a representative from the Ministry of Environment and Natural Resources from Nairobi was planning to attend such meetings.'* [KII-4, 2021]

This verbal expression indicates that the forest related meetings that were held in the morning were attended by not only the CFA leaders but also representatives from Ministry of Environment and Natural Resources.

It is clear from Figure 4.4 that 12 (4.3 %) of the male respondents while 9 (3.2 %) of the female respondents attended the forest meetings that were scheduled during the morning hours of weekends. This result advances that husbands were more likely than wives to be involved in CFA activities at 'Passive' level through attendance of CFA meetings that were held in the morning during weekends. When both the male and female key respondents were asked why they attended the CFA meetings scheduled in the morning of weekends, they revealed that this was the time when the CFA executive committee held their meetings and therefore mainly attended by the CFA leaders.

From the analysis shown in Figure 4.4, 56 (20.0 %) of the male respondents while 41 (14.6 %) of the female respondents attended the CFA meetings that were held in the afternoon hours of week days. This finding emphasizes that both the husbands and wives of CFA members were involved in forest governance at 'Passive' level through attendance of CFA meetings held in the afternoon of week days. It was revealed during interviews that some of the CFA members attended the CFA meetings in the afternoon hours of weekdays mainly during the school holidays when their children were available at home to take care of some domestic chores and child care tasks. This is in line with the scholarly work of Manginsela (2016) who

confirmed that the forest related meetings in Indonesia were held every week on Monday in the evening.

Figure 4.4 demonstrates that 123 (43.9 %) of the male respondents while 126 (45.0 %) of the female respondents attended CFA meetings that were held in the afternoon hours of weekends. This infers that both husbands and wives were involved in forest governance at 'Passive' level through attendance of CFA meetings held in the afternoon hours of weekends. While accounting for the high rate of CFA meetings attendance at this time, some of the female respondents when interviewed revealed that by this time they had performed their domestic chores while the young children were being taken care of by their older siblings who had returned from school.

4.2.6 Consultation between CFA members and CFA leaders

Borrowing from the Agarwal's model, 'Consultative' level of participation was conceived in terms of frequency of consultation between CFA members and CFA leaders (Agarwal, 2001; Agarwal, 2010). To achieve this, the respondents were asked to respond to the question that: '*How frequent do you and your spouse consulted by the CFA leaders about forest governance activities?* The results were analyzed and presented in Table 4.3 below.

Table 4.3: Frequency to which husbands and wives were consulted by CFA leaders

Statements	Gender	Frequency of consultation: Always n (%)	Sometimes n (%)	Rarely n (%)	Never n (%)	Mean score
C61. Consulted over the scheduling of CFA meetings	M	12 (4.3)	18 (6.4)	51 (18.2)	59 (21.1)	1.88
	F	3 (1.1)	7 (2.5)	54 (19.3)	76 (27.1)	1.55
C62. Consulted over planning for forest patrol	M	9 (3.2)	10 (3.6)	48 (17.1)	73 (26.1)	1.68
	F	4 (1.4)	6 (2.1)	13 (4.6)	117 (41.8)	1.26
C63. Consulted over the establishment of tree nurseries	M	23 (8.2)	38 (13.6)	52 (18.6)	27 (9.6)	2.41
	F	17 (6.1)	32 (11.4)	43 (15.4)	48 (17.1)	2.13
C64. Consulted over financial matters of CFA	M	4 (1.4)	7 (2.5)	38 (13.6)	91 (32.5)	1.46
	F	1 (0.3)	3 (1.1)	35 (12.5)	101 (36.1)	1.31
C65. Consulted over indigenous ecological knowledge	M	18 (6.4)	36 (12.9)	51 (18.2)	35 (12.5)	2.26
	F	6 (2.1)	12 (4.3)	49 (17.5)	73 (26.1)	1.65

Source: Field survey (2021)

In relation to statement C61 – Consulted over the scheduling of CFA meetings, 12 (4.3 %) of the male respondents and 3 (1.1 %) of the female respondents were ‘Always’ consulted, 18 (6.4 %) of the male respondents and 7 (2.5 %) of the female respondents were ‘Sometimes’ consulted, 51 (18.2 %) of the male respondents and 54 (19.3 %) of the female respondents were ‘Rarely’ consulted, and 59 (21.1 %) of the male respondents and 76 (27.1 %) of the female respondents were ‘Never’ consulted. As shown in Table 4.3, the mean score value for men was 1.88 which implies ‘Rarely’ while the mean score value for women was 1.55 which demonstrates ‘Rarely’. Although both the husbands and wives were rarely consulted over the scheduling of CFA meetings, this finding supports the premise that male CFA members engaged in forest governance more than the female CFA members at ‘Consultative’ level during organization of CFA meetings.

Through interviews, it was ascertained that men were involved in CFA activities by playing various roles in relation to organization of CFA meetings. For instance, male key respondent number 11 (the current CFA chair person) when interviewed, noted that:

> '*I am involved in coordinating CFA meetings and giving the CFA direction in cases of conflicts or misunderstanding between CFA leaders or among CFA members. I am also the spokesperson of the CFA and represent all the Forest User Groups.*' [KII-11, 2021]

This revelation is in line with the functions of the Chair person of the CFA which according to the PFM guidelines of 2015 was to '*preside over all meetings of the committee and at all general meetings*' (KFS, 2015: 30)

When female key respondent number 3 (the current CFA treasurer) was asked whether she was consulted by other CFA leaders, she revealed that: *'In most cases, I am usually consulted by the chairman and the secretary when planning for CFA meetings.'* This revelation above indicates that some of the female CFA members especially leaders were usually consulted by the CFA leaders especially over planning for the CFA meetings. However, through interviews it was established that there are incidences when the male CFA leaders did not consult the CFA members. For instance, it was noted that the chair person when invited to attend forest workshops or meetings organized by the Kenya Forest Service he rarely consulted the other CFA members.

With regard to statement C62 – Consulted over planning for forest patrol, 9 (3.2 %) of the male respondents and 4 (1.4 %) of the female respondents were 'always' consulted, 10 (3.6 %) of the male respondents and 6 (2.1 %) of the female respondents were 'sometimes' consulted, 48 (17.1 %) of the male respondents and 13 (4.6 %) of the female respondents were 'rarely' consulted, 73 (26.1 %) of the

male respondents and 117 (41.8 %) of the female respondents were ‘never’ consulted. As shown in Table 4.3, the mean score value for men was 1.68 which indicates ‘Rarely’ while the mean score value for women was 1.26 which reveals ‘Rarely’. The mean score difference imply that the male CFA members engaged in forest governance more than the female CFA members at ‘Consultative’ level during planning for forest patrol.

During interviews, male key respondent number 12 advanced that:

> *‘Since the forest scouts were mainly young men from the forest adjacent communities, the CFA leaders usually consulted men on venue and time of the forest patrols should be conducted. Very few female forest scouts participated in forest patrols. Therefore, during the forest related meetings very few women are usually consulted by the CFA leaders in relation to organization of forest patrols’* [KII-12, 2021]

The sentiments above affirm the argument that there were some consultative participation between the men and the CFA leaders in comparison to the women who were CFA members in relation to forest patrol.

With regard to the statement C63 – Consulted over the establishment of tree nurseries, 23 (8.2 %) of the male respondents and 17 (6.1 %) of the female respondents were ‘always’ consulted, 38 (13.6 %) of the male respondents and 32 (11.4 %) of the female respondents were ‘sometimes’ consulted, 52 (18.6 %) of the male respondents and 43 (15.4 %) of the female respondents were ‘rarely’ consulted and 27 (9.6 %) of the male respondents and 48 (17.1 %) of the female respondents were ‘never’ consulted. As shown in Table 4.3, the mean score value for men was 2.41 which imply ‘Sometimes’ while the mean score value for women was 2.13 which reveals ‘Sometimes’. Although both the husbands and wives of CFA members were sometimes consulted over the establishment of tree nurseries, the mean score difference reiterate that male CFA members engaged in forest governance more than

the female CFA members at ‘Consultative’ level during the establishment of tree nurseries.

While confirming how the CFA leaders consulted the CFA members, male key respondent number 13 revealed that:

> *‘I have been consulted by the CFA leaders during the establishment of tree nurseries. This is because I am not only a member of tree nursery establishment group but also I have my own tree nursery’* [KII-13, 2021]

The narrative above emphasizes the observation that there was consultative participation between the male CFA members and the CFA leaders on how to establish and maintain tree nurseries.

On statement C64 – Consulted over financial matters of the CFA, 4 (1.4 %) of the male respondents and 1 (0.3 %) of the female respondents were ‘always’ consulted, 7 (2.5 %) of the male respondents and 3 (1.1 %) of the female respondents were ‘sometimes’ consulted, 38 (13.6 %) of the male respondents and 35 (12.5 %) of the female respondents were ‘rarely’ consulted, and 91 (32.5 %) of the male respondents and 101 (36.1 %) of the female respondents were ‘never’ consulted. As shown in Table 4.3, the mean score value for men was 1.46 which demonstrates ‘Rarely’ while the mean score value for women was 1.31 which indicates ‘Rarely’. The mean score underscores that both male and female CFA members minimally engaged in forest governance at ‘Consultative’ level over CFA financial matters.

While explaining the extent of ‘Consultative’ level of participation in forest governance between CFA leaders and female CFA members over financial matters, female key respondent number 3 (current CFA treasurer) argued that:

> *'I am the treasurer of our CFA. Since my functions include keeping the financial records of the CFA, the chair man and secretary usually consult me in relations to financial matters of the CFA.* [KII-3, 2021]

This verbal expression above supports the view that men in the CFA leadership positions were consulted by the female CFA leaders to a great extent especially on monetary matters of the CFA. The finding above is in line with the functions of the CFA treasurer, which according to PFM guidelines of 2015 include: receiving and disbursing all money belong to the CFA, issuance of receipts for all money received, keeping of vouchers for all money spent, and accounting for all the CFA finances (KFS, 2015).

On statement C65 – Consulted by CFA leaders over indigenous ecological knowledge, 18 (6.4 %) of the male respondents and 6 (2.1 %) of the female respondents were 'always' consulted, 36 (12.9 %) of the male respondents and 12 (4.3 %) of the female respondents were 'sometimes' consulted, 51 (18.2 %) of the male respondents and 49 (17.5 %) of the female respondents were 'rarely' consulted, and 35 (12.5 %) of the male respondents and 73 (26.1 %) of the female respondents were 'never' consulted. As shown in Table 4.3, the mean score value for men was 2.26 which indicate 'Sometimes' while the mean score value for women was 1.65 which reveals 'Rarely'. The mean scores emphasize the argument that male CFA members engaged in forest governance more than the female CFA members at 'Consultative' level over indigenous ecological knowledge. Through interviews, it was noted that the elderly male and female CFA members were consulted over the indigenous knowledge that guided the protection, management, conservation and use of forest resources.

4.2.7 Reforestation activities

Within the framework of PFM, CFA members are involved in the reforestation activities such as maintenance of tree nurseries, planting of tree seedlings, weeding of planted trees, and silvicultural activities (Kimutai & Watanabe, 2016). The respondents were asked to respond to the question: *To what extent do you engage in the reforestation activities*? The results were analyzed and presented in Table 4.4 below.

Table 4.4: Extent to which both male and female spouses engage in reforestation activities

Statements	Gender	Extent of engagement				
		NA n (%)	LE n (%)	SE n (%)	GE n (%)	Mean score
C71. Establishment and maintenance of tree nurseries at forest station	M F	39 (13.9) 65 (23.2)	47 (16.8) 43 (15.4)	26 (9.3) 22 (7.9)	28 (10.0) 10 (3.6)	2.30 1.84
C72. Planting of tree seedlings within the forest	M F	24 (8.6) 53 (18.9)	31 (11.1) 32 (11.4)	27 (9.6) 29 (10.4)	58 (20.7) 26 (9.3)	2.85 2.20
C73. Weeding of planted trees within the forest	M F	44 (15.7) 29 (10.4)	41 (14.6) 32 (11.4)	37 (13.2) 33 (11.8)	18 (6.4) 46 (16.4)	2.21 2.69
C74. Pruning and thinning of planted trees within the forest	M F	38 (13.6) 73 (26.1)	31 (11.1) 56 (20.0)	44 (15.7) 9 (3.2)	27 (9.6) 2 (0.7)	2.22 1.57

Source: Field survey (2021)

On statement C71 – Establishment and maintenance of tree nurseries at the forest station, 28 (10.0 %) of the male respondents and 10 (3.6 %) of the female respondents engaged to a ‘Great extent’, 26 (9.3 %) of the male respondents and 22 (7.9 %) of the female respondents participated to ‘Some extent’, 47 (16.8 %) of the male respondents and 43 (15.4 %) of the female respondents engaged to a ‘Less extent’, 39 (13.9 %) of the male respondents and 65 (23.2 %) of female respondents did not engage at all. As shown in Table 4.4, the mean score value for statement C71

for male respondents was 2.30 which imply ‘Substantial extent’ while the mean score value for the female respondents was 1.84 which indicates ‘Minimal extent’. The mean scores indicate that the male CFA members participated to a more extent than female CFA members in forest governance at ‘Activity-specific’ level during the establishment and maintenance of tree nurseries. This contradicts the previous studies from Indonesia and Nicaragua which contend that women engaged more actively than men in the management of tree nurseries (Evans *et al*., 2017; Manginsela, 2016; Mulyoutami *et al.*, 2015).

Through in-depth interviews, some of the reasons why men dominated the role of maintaining tree seedlings at the mega-nurseries at the Cherangany Hills Forest Station at Kapcherop were established. For instance, male key respondent number 11 opined that:

> *‘Men dominated the role of maintaining the tree nurseries because the work involved in the preparation of the nursery bed and seedlings is quite tedious and also it required travelling to the Forest Station.’* [KII-11, 2021]

The observation above affirms that the main reasons why men dominated the role of establishing and maintaining tree nurseries was because the labour involved and more expenses involved in travelling to the forest station to perform the various tree nursery establishment and maintenance tasks.

On statement C72 – Planting of tree seedlings within the forest, 58 (20.7 %) of the male respondents and 26 (9.3 %) of the female respondents participated to a ‘Great extent’, 27 (9.6 %) of the male respondents and 29 (10.4 %) of the female respondents engaged to ‘Some extent’, 31 (11.1 %) of the male respondents and 32 (11.4 %) of the female respondents participated to a ‘Less extent’, and 24 (8.6 %) of the male respondents and 53 (18.9 %) of female respondents did not participate at

all. As revealed in Table 4.4, the mean score value for male respondents was 2.85 which imply ‘Substantial extent’ while the mean score value for female respondents was 2.20 which reveals ‘Substantial extent’. The mean scores affirm that both men and women participated substantially in forest governance at ‘Activity-specific’ level during planting of tree seedlings within the forest. The result of the present study is in line with the documented evidence which advance that although both men and women engaged in the planting of trees within the forest, the men dominated the activity of tree planting in Indonesia, Nepal and Vietnam (Catacutan & Villamor, 2016; Lewark *et al.,* 2011; Manginsela, 2016).

On statement C73 – Weeding of planted trees, 18 (6.4 %) of the male respondents and 46 (16.4 %) of the female respondents engaged to a ‘Great extent’, 37 (13.2 %) of the male respondents and 33 (11.8 %) of the female respondents participated to ‘Some extent’, 41 (14.6 %) of the male respondents and 32 (11.4 %) of the female respondents engaged to a ‘Less extent’, and 44 (15.7 %) of the male respondents and 29 (10.4 %) of female respondents did not engage at all. As noted in Table 4.4, the mean score value of statement C3 for male respondents was 2.21 which shows ‘Substantial extent’ while the mean score value for the female respondents was 2.69 which indicates ‘Substantial extent’. The mean scores infer that both male and female CFA members were involved in forest governance at same ‘Activity-specific’ level during weeding of planted trees within the forest. This result agrees with the documented evidence from Indonesia and Uganda which reveals that women were involved in the weeding of planted trees in the protected forest since women are more patient than men and it was socially acceptable that weeding was a ‘feminine’ activity (Banana *et al*., 2012; Kalanzi *et al.,* 2020; Manginsela, 2016).

In relation to statement C74 - Pruning and thinning of planted trees within the forest, 27 (9.6 %) of the male respondents and 2 (0.7 %) of the female respondents participated to a 'Great extent', 44 (15.7 %) of the male respondents and 9 (3.2 %) of the female respondents engaged to 'Some extent', 31 (11.1 %) of the male respondents and 56 (20.0 %) of the female respondents participated to a 'Less extent', and 38 (13.6 %) of the male respondents and 73 (26.1 %) of female respondents did not engage at all. As presented in Table 4.4, the mean score value for the male respondents was 2.22 which imply 'Substantial extent' while the mean score value for women was 1.57 which indicates 'Minimal extent'. The mean score difference emphasizes that the male CFA members engaged to a more extent than the female CFA members in forest governance at 'Activity-Specific' level during pruning of trees within the forest.

Through in-depth interviews with the CFA members, it was affirmed that husbands dominated the role of pruning of the planted trees because it is role that is culturally ascribed to men. Although existing literature from Mexico and Nepal advance that both men and women engaged in the thinning and pruning of trees from the forest (Lewark *et al*., 2011; Pineda-López *et al*., 2015), it is clear from documented evidence from Kenya and Uganda that men dominated the role of thinning and pruning trees since women are culturally prohibited from climbing trees (Bitange *et al.,* 2021; Kalanzi *et al*., 2020).

4.2.8 Forest protection

In the 'Typology of Participation' model, Agarwal (2001; 2010) argue that active participation in forest management is evidenced by involvement in environmental actions. Borrowing from these ideas, this study established that the gender sharing of

roles in the formulation of forest rules and enforcement of forest laws. The respondents were asked to respond to the question: *To what extent do you engage in the following forest protection activities*? The results were analyzed and presented in Table 4.5 below.

Table 4.5: Extent to which male and female spouses engage in forest protection activities

Statements	Gender	Extent of engagement				
		NA n (%)	LE n (%)	SE n (%)	GE n (%)	Mean score
C81. Formulation of CFA by-laws and forest use rules	M	43 (15.4)	42 (15.0)	44 (15.7)	11 (3.9)	2.02
	F	88 (31.4)	37 (13.2)	15 (5.4)	0 (0.0)	1.48
C82. Articulation of forest use rules	M	38 (13.6)	41 (14.6)	32 (11.4)	29 (10.4)	2.37
	F	22 (7.9)	54 (19.3)	31 (11.1)	33 (11.8)	2.54
C83. Forest patrols	M	46 (16.4)	43 (15.4)	37 (13.2)	14 (5.0)	2.14
	F	101 (36.1)	27 (9.6)	12 (4.3)	0 (0.0)	1.36

Source: Field survey (2021)

In relation to the statement C81 - Formulation of CFA by-laws and forest rules, 11 (3.9 %) of the male respondents and none (0.0 %) of the female respondents engaged to a 'Great extent', 44 (15.7 %) of the male respondents and 15 (5.4 %) of the female respondents were involved to 'Some extent', 42 (15.0 %) of the male respondents and 37 (13.2 %) of the female respondents engaged to a 'less extent', and 43 (15.4 %) of the male respondents and 88 (31.4 %) of the female respondents did not engage at all. As presented in Table 4.5, the mean score value for men was 2.02 which reveals 'Substantial extent' while mean score value for women was 1.48 which demonstrates 'Minimal extent'. The mean score difference reiterate that male CFA members participated more than female CFA members in forest governance at 'Active' level during formulation of forest rules. While accounting for the reasons as to why some men and women were involved in the formulation of forest rules, male key respondent number 14 argued that:

> *'The formulation of forest rules within the CFA is mainly done by the founder members of the CFA. In most cases, the founder members were both men and women.'* [KII-14, 2021]

The assertion above indicates that both men and women engaged in the formulation of forest use rules because they were the founder members of CFA. This is in contradiction with the scholarly work of Westervelt (2017) who confirmed that men dominated the process of making forest rules such as: not cutting live trees, no burning, no selling of timber and no cutting of tree near water sources within Loita Forest in Kenya**.**

With regard to statement C82 – Articulation of forest use rules, 29 (10.4 %) of the male respondents and 33 (11.8 %) of the female respondents engaged to a 'Great extent', 32 (11.4 %) of the male respondents and 31 (11.1 %) of the female respondents to 'Some extent', 41 (14.6 %) of the male respondents and 54 (19.3 %) of the female respondents to a 'Less extent', and 38 (13.6 %) of the male respondents and 22 (7.9 %) of the female respondents did not engage at all. As shown in Table 4.5, the mean score value for men was 2.37 which indicate 'Substantial Extent' while that of women was 2.54 which demonstrates that 'Substantial Extent'. The mean score values demonstrate that both male CFA members and female CFA members engaged substantially in forest governance at 'Active' level during the articulation of forest use rules within the community. In addition, it was revealed through interviews that women engaged in the articulation of the forest rules because they were more interactive with other women while men engaged in the articulation of forest rules because they occupied influential positions not only in the CFA but also public administration such as chief, assistant chief and village elders who played key role in articulation of forest use rules.

On statement C83– Forest patrols, 14 (5.0 %) of the male respondents and 0 (0.0 %) of the female respondents participated to a 'Great extent', 37 (13.2 %) of the male respondents and 12 (4.3 %) of the female respondents to 'Some extent', 43 (15.4 %) of the male respondents and 27 (9.6 %) of the female respondents to a 'less extent', and 46 (16.4 %) of the male respondents and 101 (36.1 %) of the female respondents did not engage at all. As presented in Table 4.5, the mean score value for men was 2.14 which indicates 'Substantial extent' while the mean score value for women was 1.36 which implies 'Minimal extent'. The mean score difference advances that the male CFA members participated more than female CFA members in forest governance at 'Active' level during the forest patrol.

While establishing the reasons for the male dominance in 'Active' level of participation in forest governance during forest patrol, male key respondent number 12 observed that:

> '*Although we have some female forest scouts, in most cases men are the ones who conduct the forest patrol. This is attributed to the fact that the forest patrol sessions are done in the evening and the illegal forest use especially the charcoal burning and illegal timber harvesting is carried out in the deeper parts of the forest. Most of the forest scouts are men aged between twenty and thirty five years (20-35) years especially from the Sengwer tribe (indigenous community). Our main role is to identify the illegal forest activities such as charcoal burning and illegal timber harvesting. When we identify charcoal burning the forest scouts usually destroy the charcoal earth mounds and cases of illegal timber harvesting were handled by confiscating the timber and reporting the cases to the forest guards.'* [KII-12, 2021]

The verbal expressions above highlight the idea that young men dominated the forest patrol because they were energetic and therefore walk for long distance in the steep terrain. Also, the men dominated the forest patrol because it was mainly done during evening hours and women are not allowed to walk around outside at night due to socio-cultural norms and restrictions. This observation is in line with the results of a

study carried out in Uganda by Banana *et al* (2012) who revealed that women feared to confront people intruding the forest and illegally obtaining forest resources and therefore men dominated the forest patrols and protection against intruders and forest fires.

However, it was also clear from the interviews that some women were active participants in forest patrols. For instance, female key respondent number 13 argued that:

> *'Although we have very few women who engage in forest patrol, I joined the forest scout team because I want to participate fully in the protection of the forest. I only engage in forest patrols during the day in a company of other women. My role is to identify illegal forest users which mainly includes unregistered firewood collectors.'* [KII-13, 2021]

The views above illustrate that some women engaged in forest patrol mainly during the day since they wanted to protect the forest from intruders. This finding is also consistent with the documented evidence from India and Nepal which indicates that women were active members in forest patrol that engaged in discouraging other women from breaking the law, arresting female forest intruders, and fighting of forest fires (Agarwal, 2001; Siripurapu & Geores, 2016).

4.2.9 Decision to continue with engagement in CFA activities

Borrowing from the Agarwal's model, 'Interactive' level of participation in forest governance was assessed through examining the decision to continue with engagement in CFA activities. The respondents were asked: '*Do you intend to continue with engagement in the following CFA activities?* The analyzed results were presented in Table 4.6 as indicated below.

Table 4.6: Frequency of male and female CFA spouses' intention to continue with engagement in CFA activities

Statement	Gender	Intention to continue with engagement in CFA activities		
		Yes n (%)	No n (%)	Total
C91. To continue paying CFA fees	M	67 (23.9)	73 (26.1)	140 (50.0)
	F	54 (19.3)	86 (30.7)	140 (50.0)
C92. To continue attending CFA meetings	M	46 (16.4)	94 (33.6)	140 (50.0)
	F	51 (18.2)	89 (31.8)	140 (50.0)
C93. To continue engaging in reforestation activities	M	73 (26.1)	67 (23.9)	140 (50.0)
	F	56 (20.0)	84 (30.0)	140 (50.0)
C94. To continue engaging in forest protection activities	M	18 (6.4)	112 (43.6)	140 (50.0)
	F	5 (1.8)	135 (48.2)	140 (50.0)
C95. To continue with articulation of forest use rules	M	123 (43.9)	17 (6.1)	140 (50.0)
	F	127 (45.4)	13 (4.6)	140 (50.0)

Source: Field survey (2021)

With regard to statement C91 - To continue paying CFA fees, 67 (23.9 %) of the male respondents and 54 (19.3 %) of the female respondents reported 'Yes' while 73 (26.1 %) of the male respondents and 86 (30.7 %) of the female respondents indicated 'No'. This implies that men were more likely than women to engage in forest governance at 'Interactive' level through making the decision to continue with payment of the CFA fees. Through probing, it was noted that both male and female CFA members were planning to continue paying the CFA fees because the amount of CFA fees was affordable.

In relation to statement C92 – To continue attending CFA meetings, 46 (16.4 %) of the male respondents and 51 (18.2 %) of the female respondents said 'Yes' while 94 (33.6 %) of the male respondents and 89 (31.8 %) of the female respondents indicated 'No'. This indicates that women were more likely than men to participate in forest governance at 'Interactive' level through making the decision to continue with attendance of CFA meetings. During interviews, it was affirmed that some of the men and women were planning to continue with attendance of CFA meetings so that they could get more information about the CFA activities.

Concerning statement C93 – To engage in reforestation activities within the forest, 73 (26.1 %) of the male respondents and 56 (20.0 %) of the female respondents revealed ‘Yes’ while 56 (20.0 %) of the male respondents and 84 (30.0 %) of the female respondents indicated ‘No’. This result affirms that men were more likely than women to engage in forest governance at ‘Interactive’ level through making the decision to continue engaging in reforestation activities. During interviews, it was revealed that the main reason as to why some men and women were intending to continue with maintenance of tree nurseries was because there were some financial gains through paid wage labour and the sale of the tree seedlings.

With regard to statement C94 - To continue engaging in forest protection activities, 18 (6.4 %) of the male respondents and 5 (1.8 %) of the female respondents noted ‘Yes’ while 112 (43.6 %) of the male respondents and 135 (48.2 %) of the female respondents reported ‘No’. This revelation advances that male CFA members were more likely than female CFA members to engage in forest governance at ‘Interactive’ level through making the decision to continue engaging in forest patrols. During interviews, it was confirmed that the men and women were planning to continue engaging in forest patrols mainly because they had been trained on the roles of forest scouts and had been remunerated by Non-Governmental organizations.

With regard to statement C95 - To continue with articulation of forest use rules, 123 (43.9 %) of the male respondents and 127 (45.4 %) of the female respondents indicated ‘Yes’ while 17 (6.1 %) of the male respondents and 13 (4.6 %) of the female respondents revealed ‘No’. This finding suggests that more female CFA members than male CFA members engaged in forest governance at ‘Interactive’ level through making the decision to continue engaging in articulation of forest use

rules. Through probing, it was pointed out that the men and women were planning to continue engaging in articulation of forest use rules because they had the knowledge about the roles of the CFA members and the importance of informing others about forest management.

4.2.10 Summary of the section

This section examined the nature and extent of involvement of husbands and wives in forest governance. With regard to length of membership in the CFA, the husbands had been members of CFA for a longer time compared to their wives. Concerning payment of CFA fees, both the husbands and wives paid the CFA subscription fees in most of the households sampled. In addition, husbands of CFA members attended CFA meetings more frequently than their spouses especially those held within one of the CFA members' compound.

With regard to consultation, the husbands of CFA members were likely to be consulted more than the wives of the CFA members especially during planning for upcoming CFA meetings and establishment of tree nurseries. The husbands of CFA members dominated establishment and maintenance of tree nurseries, and pruning of trees but they shared there was intra-household sharing of roles during planting and weeding of tree seedlings within the forest. Husbands dominated the role of formulation of forest use rules and forest patrols but the husbands and wives engaged in articulation of forest use rules equally. With regard to continuity with involvement in forest governance, the husbands more than their wives were likely to continue payment of CFA fees, reforestation activities and forest patrols while the wives were more likely than their husbands to continue attending CFA meetings. The continuity of husbands and wives in CFA activities such as payment of CFA fees was motivated by affordability of the CFA fees while attendance of CFA meetings was

driven by the need get more information about CFA activities. With regard to continuity with maintenance of tree nurseries the financial gain was the main driving factor whereas the continuity with forest patrols was motivated by the training and remuneration received. The adequate knowledge about the roles of the CFA members and significance of the information to others was the driving force for husbands and wives to continue engaging in articulation of forest use rules.

4.3 Gendered Decision Making Powers and Roles over Use of Forest Resources

The second objective of this study was to assess the decision making powers and roles of husbands and wives over the use of forest resources. As noted in the PFM guidelines of 2015 in Kenya, one of main objectives of the PFM is to promote sustainable use of forest resources (KFS, 2015). Building on the Theory of Feminist Political Ecology, this section examined; intra-household gendered decision making over use of forest resources, intra-household gendered responsibilities and rights over use of forest resources, intra-household gendered decision making powers over sale of forest resources, and intra-household gendered decision making to continue with use of forest resources as indicated below.

4.3.1 Gendered decision making powers over use of forest resources

This sub-section examines decision making powers and roles of husbands and wives over the use of forest resources in Cherangany Hills Forest, Kenya. The respondents were asked: '*To what extent does you and your spouse jointly engage in decision making over the use of the following forest resources*? The results were analyzed and presented as shown in Figure 4.5.

Figure 4.5 illustrates that 216 (77.1 %) of the respondents posited to a 'Great extent', 22 (7.9 %) of the respondents observed to 'Some extent', 29 (10.4 %) of the

respondents argued to a 'Less extent', and the remaining 13 (4.6 %) of the respondents noted 'Not at all'. The mean score value for the statement was 3.58 which demonstrate that there was 'Great' intra-household gendered sharing of decision making powers over the use of forest land for crop farming. This confirms the existence of collaborative relations between men and women during use of forest resources which is one of the forms of relations of power as identified in the Theory of Feminist Political Ecology (Rocheleau *et al*., 1996).

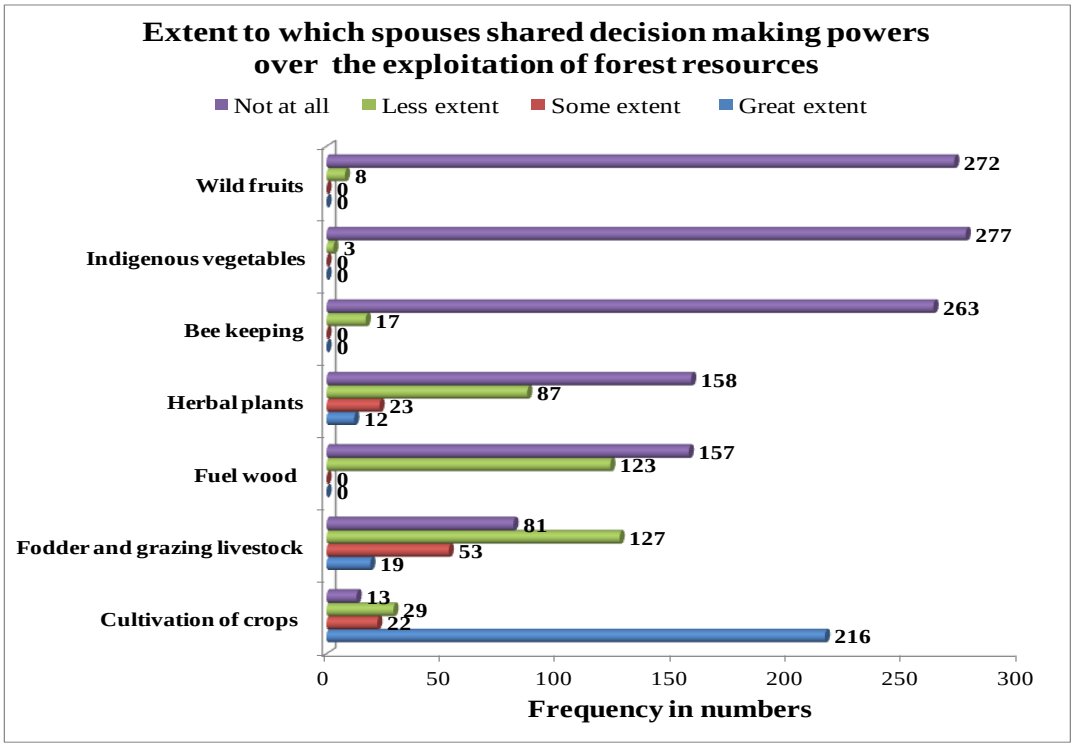

Figure 4.5: Extent to which spouses engaged jointly in household decision making over use of forest resources Source: Field Survey (2021) * Multiple responses apply

To ascertain how spouses collaborated with each other during decision making over the use of forest land for crop farming, male key respondent number 7 during an interview emphasized that:

> '*I had to agree with my wife before deciding to join the Plantation Establishment for Livelihood Improvement Scheme (PELIS) forest user group. Therefore, the decision making over the cultivation of crops such as beans, Irish potatoes and vegetables within the forest was a joint one.'* [KII-7, 2021]

This verbal expression above advance the argument that some husbands and their wives had collaborative intra-household gender relations during decision making in relation to joining the PELIS forest user group and the cultivation of food crops within the forest.

Through the views of female key respondent number 9, the reasons as to why both the men and women joined the PELIS forest user groups were identified. She opined that:

> '*Since the crops such as Irish potatoes, vegetables and beans grown under the PELIS system are highly marketable and help to supplement for the household food needs, both men and women are motivated to join PELIS forest user group*.' [KII-9, 2021]

The observations above suggests that both men and women were motivated to join the PELIS group and CFA because the crop products were on high demand at the market level and it could cater for the food needs within the households. This finding is consistent with the observation of Kimutai & Watanabe (2016) who posited that forest fringe communities were motivated to join the CFA around Lembus forest in Nakuru County (Kenya) so that they could benefit from the PELIS programme and enhance their food security.

However, female key respondent number 8 when interviewed opined that:

> '*My husband does not participate in making decisions with regard to the type of crops cultivated within the forest. This is because, most of the time he is away operating a shop at Kapcherop township. Therefore, I am the one who decides the type of crops to cultivate and when to cultivate it within the PELIS plots*'. [KII-8, 2021]

The assertions above supports the view that, within some households the wives had more intra-household decision making powers with regard to the types of food crops to be cultivated in the forest since their husbands were engaging in non-forest livelihood activities. This finding concurs greatly with the study findings of Kalanzi

et al. (2020) who found out that women dominated the decision making with regard to crops to be grown within the agro-forestry plots in Uganda due to the gender division of labour which suggests that women are food providers within their households.

Figure 4.5 shows that out of the 280 respondents, 19 (6.8 %) of the respondents affirmed that the husbands and wives made joint decision over the collection of animal fodder and grazing of livestock within the forest to a 'Great extent', 53 (18.9 %) of the respondents contended to 'Some extent', 127 (45.4 %) of the respondents argued to a 'Less extent', and the remaining 81 (28.9 %) of the respondents emphasized 'Not at all'. The mean score value for the statement was 2.04 which revealed that there was 'Substantial' gendered sharing of decision making powers over the collection of livestock fodder and grazing of animals within the forest. This finding reiterates that there was collaborative gender relation during decision making over collection of livestock fodder and grazing of animals within the forest. Thus, according to the Theory of Feminist Political Ecology there was collaborative relation between husbands and wives (Rocheleau *et al*., 1996).

During an interview with male key respondent number 6, he argued that:

> '*Both men and women have equal decision making powers to use the forest as long as they adhered to the KFS regulations. Within my household, I decide when the livestock pasture should be collected from the forest or when the livestock is taken to the forest for grazing. During the dry season we usually take the cattle and sheep to graze within the forest while during the wet season when there is a lot of livestock fodder we feed the animals within the homestead. But, when I am away from the homestead, my wife makes all the decisions concerning the feeding of the livestock.'* [KII-6, 2021]

The narrative above supports the view that men dominated the decision over when the livestock was taken to the forest for grazing as well as when the feeding of the livestock was carried out at home. This supports the arguments of the theory of

Feminist Political Ecology that reiterates the existence of unbalanced power relations between men and women during exploitation of forest resources (Rocheleau *et al*., 1996). However, women gained the decision making powers over feeding of livestock in the forest when their husbands were away from home. This revelation concurs with the academic writings of Sithole *et al*. (2021) who affirmed that men had absolute decision-making powers over the use of communal grazing areas in Zimbabwe since men were the cattle owners. Moreover, Sithole *et al*. (2021) reiterated that grazing of livestock within the communal lands in Zimbabwe was mainly done during the dry season - between the months of August and October.

While accounting for the factors that contributed to this gender asymmetry in the membership within the Grazers FUG, male key respondent number 4 advanced that:

> '*Most of the livestock owners in this community are men because compared to women, men have high financial powers and sufficient market information about the cattle. Therefore, men are joining the Grazers FUG to access grazing fields in the forest'.* [KII-4, 2021]

The revelation above highlights that men in comparison to women were better positioned to own cattle due to adequate financial resources and sufficient market information. This accounts for the reason as to why more men than women were likely to join the grazers' Forest User Group so as to gain rights to access the grazing fields in the forest to feed their livestock. This observation is in line with the academic documentation of Musyoki *et al.* (2013) who pointed out that the number of livestock has a significant influence on the decision to join CFAs within forested areas in Meru County (Kenya).

While giving the reasons as to why some women joined the Grazers FUG, female key respondent number 6 emphasized that:

> '*Although, I have low financial ability to buy livestock, the main reason as to why I joined the grazers FUG is because my husband*

> *encouraged me to join, since he is very busy with his retail shop business at Kamoi market centre*'. [KII-6, 2021]

The verbal expression above illustrates that women were encouraged to join the grazers' FUG by their spouses since some of the men were performing other livelihood activities away from their villages. This finding concurs with the scholarly writing of Giri (2009) who observed that women could assume the roles and responsibilities that were socially ascribed to men as well as gain access to forest resources with minimal restrictions when their male spouses are absent within nuclear households in Nepal.

As shown in Figure 4.5, 123 (43.9 %) of the respondents posited that the husbands and wives engaged in joint decision making over the collection of firewood to a 'Less extent' while 157 (56.1 %) of the respondents advanced that within their households there was no joint intra-household decision making over the collection of firewood from the forest. The mean score value for the statement was 1.44 which underscores that there was 'Minimal' sharing of decision making powers over the collection of firewood from the forest. This result advances that there was an unequal gender relation during decision making over collection of firewood from the forest which is in line with the Theory of Feminist Political Ecology (Rocheleau *et al*., 1996).

When female key respondent number 11 was interviewed, she said that:

> '*I make decisions over when and how much of the firewood was collected and sold because the women are the ones that know the amount of firewood required during food preparation within the households*.' [KII-11, 2021]

These verbal expressions above underline that female spouses had more intra-household decision making power over the time when the fuel wood was collected, the amount of fuel wood to be collected for home use and the amount of firewood

sold because of the gender household responsibility of food preparation for the family. Studies from Kenya corroborates that women had more decision making powers over the collection and use of fuel wood (Matiku *et al.*, 2013; Rocheleau & Edmunds, 1997). However, the results of this study contradicts the academic documentation of Manginsela (2016) who noted that both men and women made decision over the harvesting of fuel wood from protected forests in Indonesia. Further, existing literature indicates that both men and women had access to and made decisions over the exploitation of fuel wood in Uganda (Nabanoga, 2005).

Through interviews, some of the reasons as to why women dominated the firewood collectors' Forest User Group were identified. Since socio-cultural norms obligated women and girls the role of food preparation for their families as argued in the Theory of Feminist Political Ecology, some women advanced that they were motivated to join the firewood collection FUG so that they could gain access rights to firewood within the forest. This revelation concurs substantially with the observation of Sithole *et al*. (2021) who advanced that women dominated the responsibility of collecting firewood in Zimbabwe because of socio-cultural norms. It was also noted that some women were motivated to join the firewood collectors FUG so that they could earn some income by selling the extra firewood to their neighbours. This observation resembles the academic writing of Fortnam *et al*. (2019) who reiterated that women obtained income from the sale of firewood from mangrove trees within the Wasini Island of Kenya.

As presented in Figure 4.5, 12 (4.3 %) of the respondents observed that husbands and wives made joint intra-household decisions over the collection of herbal plants to a 'Great extent', 23 (8.2 %) of the respondents observed to 'Some extent', 87 (31.1 %) of the respondents argued to a 'Less extent' and the remaining 158 (56.4

%) of the respondents noted ‘Not at all’. The mean score value for the statement was 1.60 which implies that there was ‘Minimal’ gender sharing of decision making powers over the collection of herbal plants from the forest. This revelation indicates that there was unbalanced gender relation during decision making over the collection of herbal plants from the forest which resembles the premise of the Theory of Feminist Political Ecology (Rocheleau *et al*., 1996).

Some of the forest dependent communities extracted leaves, roots, barks, stems and sap from trees located along the foot paths within the forest and deeper parts of the forest (Kiprop *et al*., 2017). In addition, Kiprop *et al*. (2017) posited that these parts of plants were infused to prepare herbal medicines that were used to treat numerous ailments such as colds and cough, allergies, stomach-aches, venereal diseases, wounds and arthritis among others. From the interviews, it was established that both the male and female herbalists were either middle-aged or elderly. When female key respondent number 1 was asked why she joined the herbalists’ forest user group, she aptly noted that:

> ‘*I have traditional knowledge about diagnosis of human and livestock diseases as well as preparation of herbal medicine. My grandmother was a traditional medicine woman and she transferred this traditional knowledge to my mother who eventually transmitted the information to me and my sister. Although, nowadays most people go for medication at the hospitals, some of the elderly and middle-aged people still seek our services and buy our herbal medicine. Therefore, I joined the herbalists’ FUG to gain access to herbal plants found in the forest.*’ [KII-1, 2021]

The sentiments above affirm that the some women joined the herbalists’ forest user group to gain rights to herbal plants in the forest. Moreover, the verbal expressions above emphasizes that the herbalists had adequate traditional medicinal knowledge that had been transmitted across generations. This revelation concurs substantially with the academic work of Rotich *et al.* (2020) who advanced that within the

Cherangany Hills Ecosystem, the indigenous community (Sengwer) had prominent medicine men and women who diagnosed and treated various human and livestock diseases.

The results shown in Figure 4.5 highlights that 17 (6.1 %) of the respondents argued that the husbands and wives made joint decisions over hanging of bee-hives and harvesting of honey to a 'Less extent' while the remaining 263 (93.9 %) of the respondents reiterated 'Not at all'. The mean score value for the statement was 1.06 which suggests that there was 'Minimal' gender sharing of intra-household decision making powers over the hanging of bee hives and harvesting of honey. This observation implies that there was an unequal intra-household gender relation during decision making over the hanging of bee hives and harvesting of honey. According to the Theory of Feminist Political Ecology, the unbalanced intra-household gender relation is common during exploitation of natural resources (Rocheleau *et al*., 1996).

Through interviews, it was noted that only the men from the indigenous community (Sengwer) dominated the decisions over bee-keeping since they had the indigenous knowledge of making traditional bee-hives, hanging of the bee hives and harvesting of the honey (Kiprop *et al*., 2017; Rotich, 2019; Rotich *et al.*, 2020). Moreover, another reason as to why men dominated the proportion of bee keepers was established. Male key respondent number 3 opined that: '*The role of hanging the bee-hives and harvesting of the honey is basically for men. This is because traditions forbade women from climbing trees*.' The preceding narration underlines that the traditional gender norms while restricting women from climbing trees, mandated men to climb on trees to hang the bee-hives and harvest the honey. This revelation is in line with other studies conducted in Cameroon and Uganda that underscore that men dominated the installation of bee-hives because men were believed to be

physically capable with carrying and climbing the trees while women are culturally prohibited from climbing trees (Ingram, 2014; Kalanzi *et al.*, 2020). In addition, the revelation of present study are in line with the scholarly documentation of Mutune & Lund (2016) who argued that men dominated the practice of bee keeping in state owned forests in Kenya.

As reported during interviews, some of the reasons for joining the bee keeping forest user group were gender neutral. For instance, some of the men with adequate traditional bee-keeping knowledge joined the bee keeping forest user group to gain rights to hang bee-hives and harvest honey for both domestic and commercial uses. On the other hand, women joined the bee-keeping FUG to obtain honey for both domestic use or for sale. Some studies indicate that forest dependent communities engaged in bee-keeping since honey is useful in the treatment of bone fractures, dressing wounds, making traditional wine and as appetizers (Kiprop *et al*., 2017).

As presented in Figure 4.5, 3 (1.1 %) of the respondents opined that the husbands and wives engaged to a ‘Less extent’ in making decisions over the collection of indigenous vegetables while 277 (98.9 %) of the respondents observed that the husbands and wives did not make joint decisions over the collection of indigenous vegetables from the forest. The mean score value for the statement was 1.01 which underlines that there was ‘Minimal’ intra-household gender sharing of decision making powers over the collection of indigenous vegetables from the forest. This finding suggests that there is unequal intra-household gender relation during decision making over the collection of indigenous vegetables from the forest as advanced in the Theory of Feminist Political Ecology (Rocheleau *et al*., 1996).

According to the interview that was carried out, it was confirmed that female spouses had more decision making powers over the collection of indigenous vegetables mainly because socio-cultural norms ascribed women the responsibility of food preparation for their households. This is in line with the propositions of the Theory of Feminist Political Ecology whereby Rocheleau *et al*. (1996) contend that culture contributes greatly to the variation in gender spaces and powers over the access to natural resources. Moreover, this finding is similar to revelations of previous studies from Uganda which argues that women were more engaged in making decisions over managing of vegetables growing not only in their farm lands but also inside the forest (Nabanoga, 2005). However, the finding of the present study above differs greatly from the observations of Manginsela (2016) who in her doctoral study carried out in Indonesia indicated that both men and women made decisions about harvesting of indigenous vegetables growing in state protected forest.

Figure 4.5 indicates that out of the 280 respondents, 8 (2.9 %) of the respondents observed that husbands and wives engaged in making joint intra-household decisions over the collection of wild fruits to a ‘Less extent’ while 272 (97.1 %) of the respondents noted that in their households the husbands and wives did not engage in joint decision making. The mean score value for the statement was 1.03 which emphasizes that there was ‘Minimal’ intra-household gendered sharing of decision making powers over the collection of wild fruits from the forest. This revelation supports the propositions of the Theory of Feminist Political Ecology that there is unequal intra-household gender relation during decision making over the collection of wild fruits from the forest (Rocheleau *et al*., 1996). Recent studies from Kenya argue that both men and women harvested wild fruits from the Embobut forest reserve in the Elgeyo Marakwet County (Rotich, 2019). Moreover, Nabanoga (2005)

assert that men predominantly made decisions over the use of wild fruits such as wild guavas growing in the forest in Uganda.

4.3.2 Gendered responsibilities and rights over use of forest resources

Drawing upon the Theory of Feminist Political Ecology, this section of the study examines the gender sharing of responsibilities and rights over the use of forest resources from the Cherangany Hills Foresta. The respondents were asked: '*To what extent do you and your spouse share the responsibilities and rights over the use of the following forest resources*? The results were analyzed and indicated as shown in Figure 4.6.

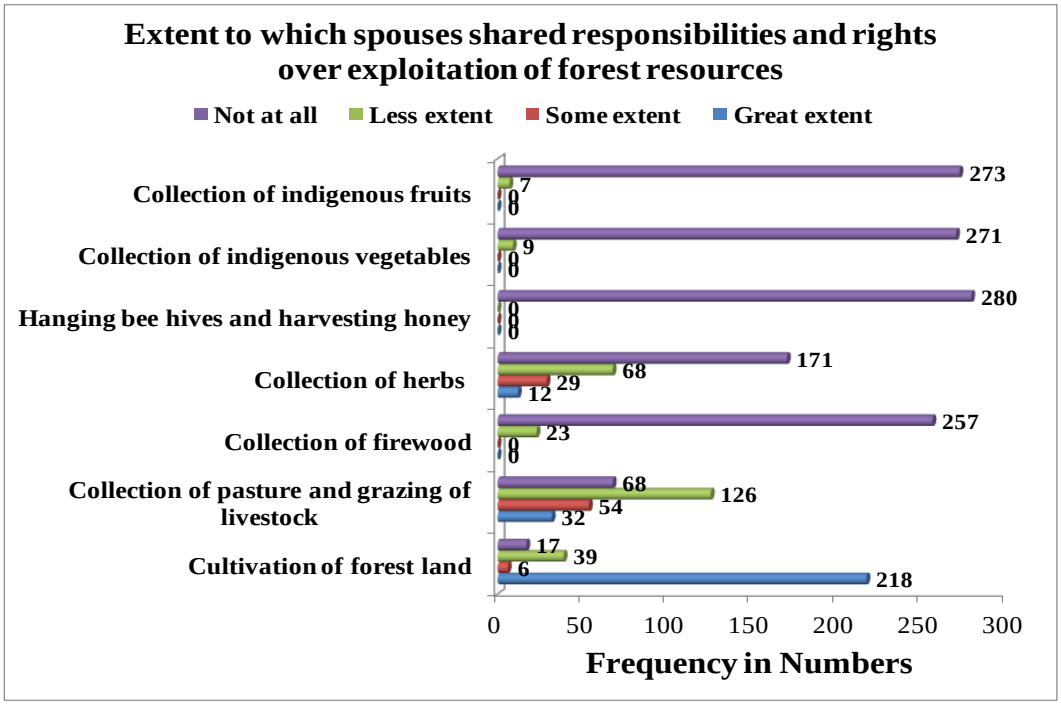

Figure 4.6: Extent to which spouses shared responsibilities and rights over use of forest resources Source: Field Survey (2021) * Multiple responses apply

As presented in Figure 4.6, 218 (77.9 %) of the respondents reported that husbands and wives shared the responsibilities and rights over the cultivation of crops within the forest land to a 'Great extent', 6 (2.1 %) of the respondents observed to 'Some Extent', 39 (13.9 %) of the respondents advanced to a 'Less Extent' and the

remaining 17 (6.1 %) of the respondents posited ‘Not at all’. The mean score value for the statement was 3.52 which indicate that the husbands and wives shared the responsibilities and rights over the cultivation of crop within the forest to a ‘Great extent’. This finding illustrates that there was substantial collaborative gender relations and minimal gender division of labour during crop farming within the forest and this contradicts the Theory of Feminist Political Ecology that emphasizes on gender division of household tasks (Rocheleau *et al*., 1996).

Through interviews, it was confirmed that there was substantial collaborative gender relations during cultivation of crops under the PELIS system. For instance, male key respondent number 1 noted that:

> ‘*I sometimes engage in the planting and weeding of crops when my wife is taking care of the children at home. Occasionally, when I need money I provide hired farm labour services to other PELIS farmers such as land clearing, ploughing, planting, weeding, harvesting, and transportation of the crop products.’* [KII-1, 2021]

These verbal expressions above underscores that although there was gender division of farm tasks, some men were motivated to perform the farm tasks that were regarded ‘feminine’ like planting and weeding when their spouses were taking care of children as well as to obtain cash from farm labour.

Through interviews, it was established that men and women shared the responsibilities over cultivation of food crops under the PELIS programme. While accounting for the reasons as to why there was minimal intra-household gender division of responsibilities in relation to cultivation of crops within the forest, male key respondent number 2 advanced that:

> *‘I engage in land preparation while my wife is the one who plants and weeds the beans and Irish potatoes because the crops are very marketable. I also help in the harvesting and transportation of these crop products from the forest.’* [KII-2, 2021]

The narration above reiterates that the amount of the work involved during cultivation of crops discouraged some men from cultivating crops under the PELIS system. During harvesting of crops grown within the forest, it was reported that women engaged in harvesting while the men lend a '*helping hand*' to their wives by transporting the crop produce to their homes or markets. Interviews indicate that the male spouses transported the crop products by use of motorcycles or on their backs depending on the quantity and distance to be covered.

This revelation demonstrates that there was gender division of labour with regard to cultivation of food crops as well as harvesting and transportation of crop products. The findings of the present study above concurs with the scholarly writing of Nkengla (2014) who advanced that women made decisions over the type of crops to be grown in the forest since they are responsible for household food and health care provision in Ghana. Moreover, Manginsela (2016) revealed that men participated in land preparation, application of pesticides and fertilizers, and transportation of food crops products whereas the women engaged in planting, weeding, harvesting and selling of food crop products cultivated in the forest in Indonesia.

When the Kenya Forest Service law enforcement officer was asked how men and women gained the rights to cultivate food crops within the protected forest under the PELIS programmes he noted that*:*

> *'The forest farmer must be a registered member of both CFA and the subsidiary PELIS forest user group and residing within a radius of 5 kilometers from the forest boundary. He/she must pay an annual royalty fee of 250 Kenya Shillings per a quarter (1/4) of an acre of land. Cultivation of the allocated PELIS plot is for duration of between 3 and 5 years since by this time the planted trees will be tall enough and therefore rendering intercropping within the PELIS plot untenable. After ploughing the plot, the PELIS user is given tree seedlings by the Kenya Forest Service for planting within the allocated PELIS plot which is intercropped with short term food*

> *crops such as beans and Irish potatoes (maize growing within the PELIS plots was outlawed as from 2019). During weeding, the PELIS users must ensure they do not damage the young trees and if the trees wither the PELIS user must report to the KFS so that the PELIS farmer is given more trees for replacement which is monitored by the KFS guards. The PELIS user must be very keen to avoid destroying the planted trees during harvesting of their crop products since failure to adhere to these regulations the PELIS user was denied the permit to continue farming*.' [KII-17, 2021]

The excerpt above underlines that the rights to practice crop farming within the forest land was gained through payment of royalty fees while the ability to continue using the PELIS plot depended on the stipulated time (3-5 years) and ability to monitor and protect the planted trees from destruction. As argued by Mbuvi *et al*. (2009) the Plantation Establishment for Livelihood Improvement Scheme (PELIS) involved the allocation of newly cleared sections of forest to forest adjacent communities to grow food crops for 2-3 years after trees have been planted. These scholars add that the crop farming permitted to continue for another 2 years when the tree shade could not allow for further crop growing (Mbuvi *et al*., 2009).

As shown in Figure 4.6, 32 (11.4 %) of the respondents argued that husbands and wives shared the responsibilities and rights over the collection of livestock fodder and grazing of livestock within the forests to a 'Great extent', 54 (19.3 %) of the respondents advanced to 'Some Extent', 126 of the respondents (45.0 %) quipped to a 'Less extent', and 68 (24.3 %) of the respondents revealed 'Not at all'. The mean score value for the statement was 2.18 which underscores that there was 'Substantial' gendered sharing of intra-household responsibilities over the collection of livestock fodder and grazing of livestock within the forest.

This observation supports the view that there was collaborative intra-household gender relation and minimal gender division of labour during collection of livestock fodder and grazing of livestock within the forest and this disagrees with the

propositions of Theory of Feminist Political Ecology that emphasizes on gender division of household tasks (Rocheleau *et al*., 1996). The result of present study corroborates with the findings of Mbuvi (2018) and Westervelt (2017) who reported that men engaged more than women in grazing of livestock within the Loita forest in Kenya due to the idea that the Maasai women were regarded as 'home keepers' while some women believed that herding livestock in the forest was dangerous due to wild animals.

Through interviews, it was reported that some of the women were culturally ascribed the role of feeding the livestock owned by their husbands. However, it was noted that this gender ascribed role was challenged by the economic status, educational background and employment status of some of the wives as male key respondent number 11 noted that:

> '*My wife is well educated and has a job. I do not expect her to go to the forest to graze the animals. We have employed a worker who can take care of livestock and other household chores*.' [KII-11, 2021]

Moreover, it was pointed out that some men and male children from households located nearer the forest grazed their cattle and sheep in the open grasslands (glades) within the forest during the dry season. This revelation concurs substantially with the documentation of Kimutai & Watanabe (2016) who advance that some of the livestock keepers grazed their cattle and sheep in the open fields (glades) found in the forest.

Moreover, some respondents opined that men and women harvested grass and shrub leaves for the cattle, sheep and goats from the forest margins, along the paths and deeper inside the forest depending on the availability of the pasture. Although men among the forest adjacent communities living around Loita Forest (in Kenya) went to the forest particularly to herd their livestock, Westervelt (2017) corroborated that

both men and women shared roles with regard to herding and watering of cows. In their study, Kiprop *et al*. (2017) argued that forest dependent communities around Mt Elgon forest and Cherangany Hills Forest collected grass as well as leaves from the forest to supplement animal feeds during the drought seasons.

When one of the Kenya Forest Service law enforcement officers was asked how men and women gained the rights to access grazing fields within the forested areas, he quipped that:

> '*1. The livestock keeper must be a member of the CFA and grazers FUG; 2. He or she must be ready to pay a royalty fee of between Ksh 30 and Ks 100 per month depending on the type of the livestock; 3. The cattle and sheep are the only animals allowed to graze within the forest but the goats and donkeys are not allowed (mainly because goats and donkeys tend to destroy the tender tree seedlings and leaves of trees); 4. The grazing should be confined within the zoned areas within the forest; and 5. The livestock grazing within the forest should not be left unattended to.'* [KII-17, 2021]

The sentiments of the KFS forest law enforcement officer implies that the right to access grazing spaces within the forest was determined by one being a member of the CFA and FUG, ability to pay a monthly royalty fee, and abide by the stipulated regulations such as to graze only allowed animals in the zoned areas under the supervision of the cattle owners. The findings of the current study is in line with the academic writing of Rotich (2019) who advanced that grazing of livestock in the Embobut Forest in Kenya was permitted upon payment of 30 Kenya Shillings per head of animal per month. Upon payment of the grazing fee, Kimutai & Watanabe (2016) corroborated that livestock keepers were allowed to graze cattle and sheep within the Lembus forest located in Nakuru County in Kenya. While stating the amount of the royalty fees paid for grazing animals in the forest, Mbeche *et al*. (2021) added that forest adjacent communities within Mt Elgon Forest were permitted to graze their livestock within forest upon payment of 100 Kenya Shillings

per month per head of animal to the Kenya Forest Service. However, this finding contradicts the observations of Sanjay (2017) who revealed that grazing of livestock in the forest within Nepal was for free throughout the year.

The results presented in Figure 4.6 demonstrate that 23 (8.2 %) of the respondents argued that the husbands and wives shared the responsibilities and rights over the collection of firewood from the forest to a 'Less extent' while 257 (91.8 %) of the respondents revealed that the husbands and wives did not share 'Not at all'. The mean score value for the statement was 1.08 which suggests that spouses shared the responsibilities over the collection of firewood from the forest to a 'Minimal extent'. This result reiterates that there was unbalanced intra-household gender relation and gendered division of responsibilities with regard to collection of firewood from the forest which is in line with the Theory of Feminist Political Ecology that proposed for gender division of household responsibilities (Rocheleau *et al*., 1996).

The interviews carried out indicated that women collected firewood found at the margins of the forest, along the foot paths within the forest, and deeper parts of the forest. It was established through interviews that the gender roles ascribed to women such as food preparation accounted for the dominance of women in the collection of firewood from the forested lands. In her doctoral study conducted among communities living adjacent to Loita Forest, Westervelt (2017) affirmed that firewood collection was mainly the role of women and the firewood collection was mainly done during the dry season because there was more cooking taking place during this time. This finding concurs with the recent scholarly writing of Sithole *et al*. (2021) who revealed that women dominated the responsibility of collecting firewood in Zimbabwe since it was perceived to be a 'feminine' job.

Moreover, it was clear through interviews that the quantity of firewood and home distance from the forest accounted for the gender asymmetries that were observed during fetching and transporting of the firewood from the forest. For example, women and children carried the dead wood harvested from the forest on their backs if the distance to be covered was shorter and the amount of firewood was smaller. This finding agrees with the previous studies from Ethiopia which demonstrates that men managed the collection and transportation of large quantities of firewood while women were concerned with the collection and transportation of little amount of firewood (Abate, 2020).

While demonstrating the parts of trees from which the women obtained firewood, studies from Uganda corroborates that women were involved more in the extraction of firewood from twigs and branches of trees (Kalanzi *et al*., 2020). More previous studies from Uganda contend that women and children dominated the collection of firewood from the forest (Nabanoga, 2005).

When one of the KFS law enforcement officers was asked how men and women gained the right to access small scale firewood collection, he noted that:

> *The firewood collector must be a member of CFA and a member of firewood collectors FUG. He/she must pay a royalty fee of about 120 Kenya Shillings per month (100 Kenya Shillings goes to KFS and 20 Kenya Shillings goes to the Kenya Revenue Authority). The firewood collector should only collect a dead wood or a tree that has fallen due to natural causes and should not collect firewood by cutting down the trees*.' [KII-17, 2021]

The revelations of the KFS forest rules enforcement officer implies that the right to access the firewood from the forest for small-scale household use (although there was also large scale firewood collection for schools and tea factories, this was beyond the scope of this study) was contingent upon being a member of the CFA, ability to pay the royalty fee and ability to abide by the forest laws and regulations.

This revelation is in line with the research finding of Rotich (2019) who observed that the forest adjacent communities within the Embobut forest in Kenya obtained the firewood harvesting permit by paying 120 Kenya Shillings per month as royalty fees to the Kenya Forest Service. In a study carried out in Mt Elgon, Mbeche *et al.* (2021) pointed out that forest dependent communities paid 100 Kenya Shillings per month to gain access to firewood within the forest.

It is clear from Figure 4.6 that out of the 280 respondents, 12 (4.3 %) of the respondents reported that the husbands and wives shared the responsibilities and rights over the collection of herbs for medicinal purposes from the forest to a 'Great extent', 29 (10.4 %) of the respondents confirmed to 'Some extent', 68 (24.3 %) of the respondents opined to a 'Less extent' and 171 (61.1 %) of the respondents revealed 'Not at all'. The mean score value for the statement was 1.58 which indicates that there was an unequal intra-household gender relation and gender division of labour with regard to collection of herbal plants from the forest for medicinal reasons as argued in the Theory of Feminist Political Ecology (Rocheleau *et al*., 1996). The findings of the present study substantially contradicts the academic revelation of several studies which observed that both elderly female and male herbalists harvested herbal plants from state-managed forests in Kenya (Kurui, 2016; Rotich, 2019; Rotich *et al.*, 2020; Westervelt, 2017).

During interviews, some of the reasons for the unbalanced intra-household gender relations and gendered division of labour between husbands and wives during the collection of herbal plants were established. Some of the interviewed respondents noted that women dominated the collection of herbal plants and preparation of herbal medicine because they were the ones taking care of the sick family members. Therefore, they were motivated to go to the forest to collect herbal plants for the

preparation of herbal medicine to treat the various ailments that their family members were suffering from. On the other hand, some of the key respondents revealed that some of the men collected the herbal plants for preparation of the herbal medicine mainly for sale. This revelation concurs substantially with the documentation of Kalanzi *et al*. (2020) who pointed out that women participated in the harvesting of tree leaves for medicinal purposes in Uganda.

While examining how the herbalists gained rights to access herbal plants within the forest, one of the KFS law enforcement officers noted the following: *'1. The herbalist must be a member of the CFA and herbalist FUG; 2. He/she must pay a royalty fee of 1000 Kenya Shillings per year to KFS*.' The verbal expressions of the KFS law enforcement officer indicates that men and women gained rights to access herbal plants growing in the forest through being members of CFA and herbalist FUG, and payment of the royalty fee to the KFS.

Moreover, through an interview with male key respondent number 10, it was clear that indigenous ecological knowledge and rules guided the traditional herbalists during collection of the herbal plants and they included:

> *(i) The barks from trees with medicinal value must be keenly removed and the 'bruised part' must be smeared with soil or cow dung to enhance healing and to prevent the drying up of the whole tree (since through indigenous forest knowledge the tree recovers after four (4) years). (ii) Only a small part of tree roots or 'branches of the tree roots' and shrubs of medicinal value must be retrieved, but not the whole root and thereafter the cut part is covered with soil to accelerate healing of the tree. (iii) Concerning the collection of tree leaves for medicinal purposes, only some parts of the leaves are removed. (iv) With regard to harvesting of tree fruits with medicinal significance e.g. 'lamaywo' (Syzigium cordatum), it was noted that only a few of the fruits should be removed since the remaining tree fruits are meant for wild animals like monkeys.'* [KII-10, 2021]

It is clear from the narrative above that the indigenous ecological knowledge enhanced the sustainable harvesting of barks, roots, leaves, fruits and sap from trees

for medicine purposes. In their studies carried out in Mt Elgon and Cherangany Hills Forest, Kiprop *et al*. (2017) and Kurui (2016) contended that uprooting of the whole herbal plant was outlawed, after extraction of barks the wound is smeared with soil to enhance faster healing and evade insect attack, only one side of the tree is debarked and only a few roots of trees are removed and the remaining roots are covered with soil to avoid the dying of herbal tree.

As demonstrated in Figure 4.6, all the 280 respondents (100 %) affirmed that within their households the husbands and wives did not share the responsibilities and rights over the hanging of bee hives and harvesting of honey from the forested spaces. The mean score value for the statement was 1.00 which implies that there was 'Minimal' gender sharing of intra-household responsibilities over the harvesting of honey within the forested landscapes. This finding reveals that there was unbalanced intra-household gender relation and gender division of labour during hanging of bee hives and harvesting of honey from the forest as explained in the Theory of Feminist Political Ecology (Rocheleau *et al*., 1996). This revelation is in line with the scholarly documentation of Mutune & Lund (2016) who argued that men dominated the practice of bee keeping within state owned forests in Kenya. However, it was highlighted during interviews that some women from the indigenous forest community (Sengwer) played a role in processing of the honey and encouraging their husbands to join and practice bee-keeping with the forested landscape. Although bee keeping is a culturally male dominated activity in Cameroon, Ingram (2014) who noted that women are increasing engaging in bee keeping through processing and sale.

While assessing how honey gatherers gained the rights to practice bee keeping within the forest, one of the KFS law enforcement officer pointed out the following: *'(1) The bee keeper must be a member of CFA and bee keeping FUG (2) He/she must pay a royalty fee of 100 Kenya Shillings per year to hang the hives'.* From the views of KFS law enforcement officer, it was revealed that the right to access forest resources was gained through being members of the bee keeping FUG and payment of the royalty fee.

Apart from the KFS regulations, it was clear that there existed some communal based informal rules that guided the hanging of bee hives and harvesting of honey within the forested lands as male key respondent number 9 noted that:

> *(i) While hanging the bee hives, the bee keepers must ensure it is placed on a tree that cannot be broken or interfered with its growth. (ii) During harvesting of the honey no cutting of trees is allowed. (iii) Only the elderly men were allowed to hang bee-hives and harvest honey because young people were likely to cut the trees. (iv) Two people or more people must be involved during harvesting of honey such that while one is harvesting the honey the other persons puts off the fire using water to prevent forest fires. (v) Also, the person harvesting the honey should only harvest from his bee-hive since it was a taboo for one to harvest honey from a bee hive that does not belong to them'.* [KII-9, 2021]

Some of the interviewed respondents reiterated that the hanging of bee hives and bee keeping assisted to reduce illegal tree logging because according to them it was a taboo to cut a tree and it falls on the bee hive. This finding agrees substantially with the observations of Kiprop *et al*. (2017) who found out that some indigenous forest knowledge and rules such as old people engaged in harvesting of honey, two people involved during harvesting and the trees bearing bee hives should not be felled since it was a taboo among the indigenous communities living adjacent to the Mt Elgon Forest and Cherangany Hills Forest.

As indicated in Figure 4.6, 9 (3.2 %) of the respondents indicated that the husbands and wives shared the responsibilities and rights over the collection of indigenous vegetables from the forest to a 'Less extent' while 271 (96.8 %) of the respondents advanced that the husbands and wives did not share at all. The mean score value for the statement was 1.03 which emphasizes that there was 'Minimal' intra-household gender sharing of responsibilities and rights over the collection of wild vegetables. This revelation confirms that there was unequal intra-household gender relation and gender division of labour during collection of wild vegetables from the forest which is in line with the propositions of the Theory of Feminist Political Ecology (Rocheleau *et al*., 1996).

During interviews, it was revealed that women collected indigenous vegetables such as *Chepkerta* (Amaranthus species), *Kisocho* (African night shade/ *Solanum nigrum)* and *Nderem (Basella Alba)* as well as mushrooms from the forest. It was also reported that the women had more rights over how much the indigenous vegetables such as Amaranthus Spp, African Night Shade and mushrooms among others that were collected from the forest was retained for household consumption and how much was sold to their neighbours. It was established that both men and women were involved in the collection of wild vegetables located at the margins of the forest, along the foot paths within the forest, and deeper parts of the forest.

As shown in Figure 4.6, 7 (2.5 %) of the respondents reported that husbands and wives shared the responsibilities and rights over collection of wild fruits to a 'Less extent' and 273 (97.5 %) of the respondents indicated that husbands and wives did not share at all. The mean score value for the statement was 1.03 which indicates that there was 'Minimal' sharing of responsibilities and rights between husbands and

wives during the collection of wild fruits from the forest. This result demonstrates that there was unbalanced intra-household gender relation and gender division of responsibilities during the collection of wild fruits from the forest as proposed in the Theory of Feminist Political Ecology (Rocheleau *et al*., 1996).

When female key respondent number 10 was asked to account for minimal collaborative intra-household gender relations during the collection of wild fruits from the forest, she revealed that:

> *'The collection of indigenous fruits is not restricted by the forest laws, therefore during the collection of firewood, cultivation of the PELIS plots and grazing of the animals within the forest both men and women can collect the indigenous fruits as long as it is available. But, in most cases the children are the ones that engage in the picking of fruits from the forest'* [KII-10, 2021]

The revelation above highlights that the responsibility of the collection of wild fruits was shared between some husbands and wives because it depended on who had gone to the forest at that time and availability of the wild fruits in the forest. This finding is in line with the arguments of some scholars who pointed out that both men and women had access rights over wild fruits found in the forested areas in Indonesia and Kenya (Manginsela, 2016; Rotich, 2019). Although both men and women had access to fruits growing in the forest, numerous studies from Africa argue that women had more access to and use rights to wild fruits in Kenya and Uganda (Kalanzi *et al*., 2020; Rocheleau & Edmunds, 1997). As observed by Kalanzi *et al*. (2020) women were involved in the collection of fruits for domestic consumption in Uganda.

It is also clear from the interviews that children engaged in the collection of edible wild fruits from the forest. While accounting for the factors influencing the collection of edible wild fruits from the Cherangany Hills Forest in Kenya, Kiprop *et al*. (2017) posit that the age of the consumers, availability of the fruits, productivity

of the fruit trees and household preferences for the type of fruits were the main determinants of fruit collection within the forest. In addition, Westervelt (2017) affirms that young children collected wild fruits from the forest among the Maasai Community in Kenya.

4.3.3 Gendered decision making over the sale of forest products

This sub-section of the study assessed the extent to which men and women shared the intra-household decision making powers over the sale of forest products. In order to achieve this sub-objective, the respondents were asked: '*Who makes the decision over the sale of forest products*? From the analysis, the results were as illustrated in Figure 4.7 below.

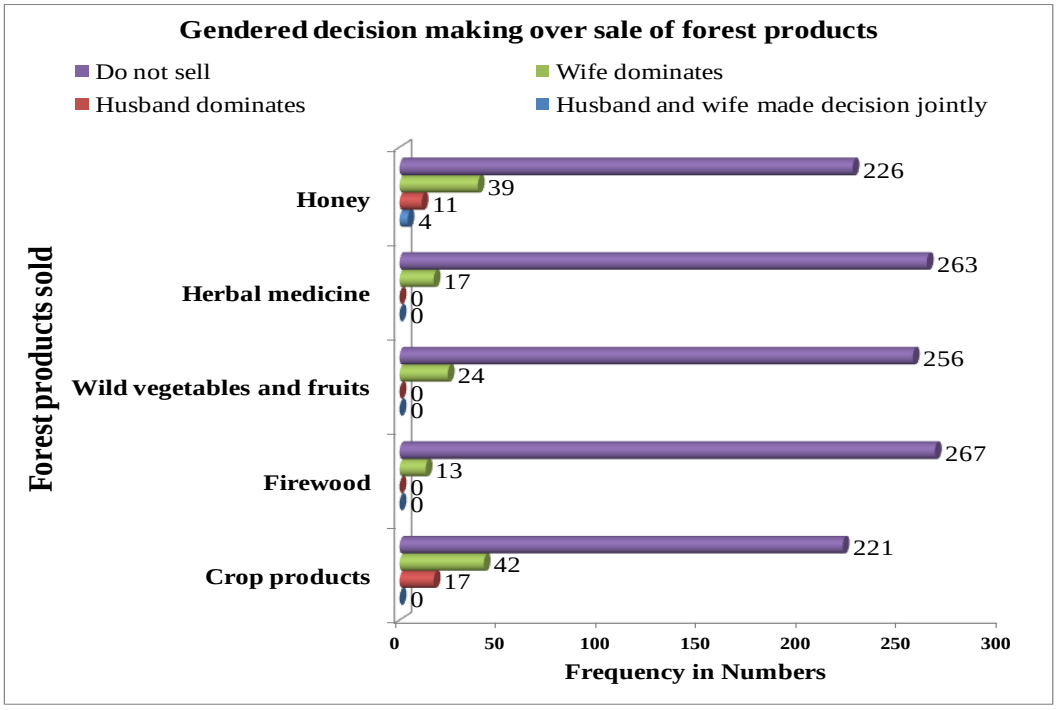

Figure 4.7: Gender sharing of intra-household decision making powers over the sale of forest products Source: Field Survey (2021)

From Figure 4.7 above, 17 (6.1 %) of the respondents noted that the husbands dominated the decision making over the sale of crop products, 42 (15.0 %) of the respondents argued that the wives dominated the decision making, and 221 (78.9 %) of the respondents advanced that they did not sell the crop products. This finding

highlights that there was unequal intra-household gender relations during decision making over the sale of crop products since in some households the male spouses dominated while in other households women solely made the decision over the sale of crop products. This supports the arguments of the Theory of Feminist Political Ecology that there was unbalanced gender relation during household decision making over management of natural resources (Rocheleau *et al*., 1996).

Through interviews, it was emphasized that the selling of the crop products such as Irish potatoes, beans and cabbages were mainly done by women. In addition, women had more decision making powers to determine the quantity of crop products to be sold because one of the culturally defined gender household roles was food preparation.

The results shown in Figure 4.7 above indicate that 13 (4.6 %) of the respondents confirm that the wives made the decision over the sale of the firewood while 267 (95.4 %) of the respondents said that they did not sell the firewood. This underscores that there was unbalanced intra-household gender relations during decision making over the sale of firewood because women solely made the decision to sell firewood which agrees with the propositions of the Theory of Feminist Political Ecology (Rocheleau *et al*., 1996). This was attributed to the fact that women had more right over how much firewood was sold because they were in a position to establish the amount that was sufficient for household needs and extra firewood could be sold. Moreover, a majority of the respondents that collected the firewood did not sell the firewood because they used to meet the energy needs at the household level and small quantity of firewood was collected.

As shown in Figure 4.7, 24 (8.6 %) of the respondents revealed that wives made decision over the sale of the wild vegetables and fruits while 256 (91.4 %) of the respondents observed that they did not sell the wild vegetables. This finding reveals that there was no gender sharing of intra-household decision making powers over the sale of wild vegetables and fruits due to the fact that women solely made the decision over selling of wild vegetables and fruits. Therefore, there was unbalanced intra-household gender relation over the sale of vegetables and fruits which is in line with the arguments of the Theory of Feminist Political Ecology (Rocheleau *et al*., 1996).

Some of the interviewed respondents posited that the women dominated the decision making because they were the ones who engaged in collection as well as food preparation and therefore were aware of how much vegetables is needed for household consumption as well as for selling. Through interviews, it was reported that much of the indigenous vegetables and fruits collected from the forest was not sold but consumed at the household level to supplement the food needs and save on the expenses of buying the same from the market or neighbours. This revelation concurs substantially with the academic documentation of Kiprop *et al*. (2017) who advanced that the edible fruits such as *Tamarindus indica, Syzigium cordatum and Mbuunik* were sold at the local markets near Cherangany Hills Forest and Mt Elgon forest.

It is clear from Figure 4.7 above that 17 (6.1 %) of the respondents observed that wives made decision over the sale of the herbal medicine whereas 263 (93.9 %) of the respondents posited that they did not sell the herbal medicine. This emphasizes that there was minimal intra-household gendered sharing of decision making powers over the sale of herbal medicine. Therefore, there was unequal intra-household

gender relation during decision making over the sale of vegetables and fruits which agrees with the propositions of the Theory of Feminist Political Ecology (Rocheleau *et al*., 1996). Through in-depth interviews, it was further revealed that both male and female herbalists collected medicinal plants from the forest, extracted herbal medicine and later sold it to the people within the village and neighbouring counties (especially Trans Nzoia and Uasin Gishu). This revelation is in line with the observations of doctoral study of Kurui (2016) who reported that the herbalists within Keiyo South in Elgeyo-Marakwet County treated people within their neighbourhood while the herbal vendors sold their medicine not only within the sub-county but also in other counties such as Uasin Gishu and Trans Nzoia.

The results presented in Figure 4.7 above reveal that 4 (1.4 %) of the respondents argued that the husbands and wives shared the decision making over the sale of honey, 11 (3.9 %) of the respondents advanced that husbands dominated the decision over the sale of honey, 39 (13.9 %) noted that the wives dominated the decision over the sale of honey, and 226 (80.7 %) of the respondents reported that they did not sell the honey. This result underlines that there was ‘minimal’ intra-household gendered sharing of decision making over the sale of honey because in a majority of the households that practice bee-keeping either the husbands or wives dominated the decision over the selling of honey. Thus, there was unbalanced intra-household gender relation during decision making over the sale of honey which concurs with the arguments of the Theory of Feminist Political Ecology (Rocheleau *et al*., 1996). While accounting for the reasons of unequal intra-household gender relations during decision making over the sale of honey, it was revealed through interviews that the men hanged the bee-hives and harvested the honey which was believed to be tedious while the women mainly engaged in the processing and selling of the honey.

4.3.4 Gendered decision making over the continuity to use forest resources

The decision making over the continuity to use forest resources highlights the temporal extent to which gender relations are manifested in use of forest resources. The respondents were asked: '*Do you intend to continue engaging in the exploitation of the following forest resources?* The analyzed results were presented in Table 4.7 as indicated below.

Table 4.7: Whether husbands and wives intend to continue with exploitation of forest resources

Statement	Gender	Intention to continue with exploitation of forest resources		
		Yes n (%)	No n (%)	Total n (%)
D41. Cultivation of crops within the forest	M	122 (43.6)	18 (6.4)	140 (50.0)
	F	134 (47.9)	6 (2.1)	140 (50.0)
D42. Pasture collection and grazing of livestock within the forest	M	117 (41.8)	23 (8.2)	140 (50.0)
	F	93 (33.2)	56 (15.8)	140 (50.0)
D43. Collection of firewood from the forest	M	0 (0.0)	140 (50.0)	140 (50.0)
	F	129 (46.1)	11 (3.9)	140 (50.0)
D44. Collection of herbal plants from forest	M	21 (7.5)	119 (42.5)	140 (50.0)
	F	37 (13.2)	83 (36.8)	140 (50.0)
D45. Bee keeping within the forest	M	14 (5.0)	126 (45.0)	140 (50.0)
	F	0 (0.0)	140 (50.0)	140 (50.0)
D46. Collection of indigenous vegetables	M	0 (0.0)	140 (50.0)	140 (50.0)
	F	81 (28.9)	59 (21.1)	140 (50.0)
D47. Continue with collection of wild fruits	M	26 (9.3)	114 (40.7)	140 (50.0)
	F	23 (8.2)	117 (41.8)	140 (50.0)

Source: Field survey (2021)

With regard to statement D41 – Cultivation of crops within the forest, 122 (43.6 %) of the male respondents and 134 (47.9 %) of the female respondents said 'Yes', while 18 (6.4 %) of the male respondents and 6 (2.1 %) reported 'No'. This result infers that wives were more likely than husbands to continue with cultivation of crops within the forest. Through interviews, it was emphasized that the main reason as to why husbands and wives were intending to continue with cultivation of crops

within the forest was because crop products were very significant for household food security and source of income when sold.

In relation to statement D42 - Continue with grazing of livestock within the forest, 117 (41.8 %) of the male respondents and 93 (33.2 %) of the female respondents revealed ‘Yes’ while 23 (8.2 %) of the male respondents and 56 (15.8 %) of the female respondents said ‘No’. This implies that husbands were more likely than wives to continue with grazing of livestock within the forest. During interviews, it was revealed that the main reason as to why husbands and wives were intending to continue with grazing of livestock within the forest was because the livestock mainly grazed within the forest during the dry season when there was scarcity of pasture within the homestead.

With regard to statement D43 - Continue with collection of firewood from the forest, none (0.0 %) of the male respondents and 129 (46.1 %) of the female respondents indicated ‘Yes’ while 140 (50.0 %) of the male respondents and 11 (3.9 %) of the female respondents said ‘No’. This result reiterates that wives were more likely than husbands to continue engaging in the collection of firewood from the forest. While explaining for the intentions to continue engaging in forest protection, some of the women interviewed affirmed that they were planning to continue engaging collection of firewood from the forest because the firewood collected from the forest was already dry for cooking and could be easily available upon payment of the permit fee.

In relation to statement D44 - Continue with collection of herbal plants from forest demonstrates, 21 (7.5 %) of the male respondents and 37 (13.2 %) of the female respondents reported ‘Yes’ while 119 (42.5 %) of the male respondents and 83 (36.8

%) of the female respondents noted ‘No’. This revelation emphasizes that wives were more likely than husbands to continue with collection of herbal plants from the forest. Some of the husbands and wives were planning to continue with collection of herbal plants from forest because they were using the herbal medicine to treat various ailments.

With regard to statement D45 - Continue with bee keeping within the forest, 14 (5.0 %) of the male respondents and none (0.0 %) of the female respondents said ‘Yes’ while 126 (45.0 %) of the male respondents and 140 (50.0 %) of the female respondents said ‘No’. This finding infers that husbands were the only ones planning to continue with hanging of bee hives and harvesting of honey.

In relation to statement D46 - Continue with collection of indigenous vegetables, none (0.0 %) of the male respondents and 81 (28.9 %) of the female respondents indicated ‘Yes’ while 140 (50.0) of the male respondents and 59 (21.1) of the female respondents said ‘No’. This observation reveals that wives were more likely than husbands to continue with collection of indigenous vegetables from the forest. During interviews, it was confirmed that wives were planning to continue with collection of indigenous vegetables from the forest because these vegetables are easily available and could save the expenses for buying vegetables at the market or neighbours.

In relation to statement D47 - Continue with collection of wild fruits, 26 (9.3 %) of the male respondents and 23 (8.2 %) of the female respondents reported ‘Yes’ while 114 (40.7 %) of the male respondents and 117 (41.8 %) of the female respondents observed ‘No’. This result emphasizes that husbands were more likely than wives to continue engaging with collection of wild fruits from the forest. While explaining the

intention to continue with collection of wild fruits from the forest, some of the husbands and wives advanced that they were planning to continue with collection of wild fruits to supplement for household consumption.

4.3.5 Summary of the section

This section aimed at assessing the gendered sharing of decision making powers and roles over the use of forest resources. It was confirmed that there was collaborative power relation between husbands and wives during decision making in relation to cultivation of food crops within the forest and collection of livestock fodder and grazing of livestock within the forest. But, it was revealed that there was minimal collaboration during decision making over collection of herbal plants, hanging of bee-hives and harvesting of honey, collection of indigenous vegetables and fruits from the forest.

With regard to gendered sharing of roles over use of forest resources, the results demonstrated that the husbands and wives shared roles and rights over cultivation of crops within the forest, collection of livestock fodder and grazing of livestock within the forest. However, there were gendered roles and rights during collection of firewood, herbal plants, harvesting of honey, collection of indigenous vegetables and wild fruits.

Concerning the gendered sharing of decision making over sale of forest products, wives dominated the sale of some crop products, firewood, indigenous vegetables and herbal medicine. Wives were more likely than husbands to continue with cultivation of crops, collection of firewood, within the forest, herbal plants, and indigenous vegetables. On the other side, the husbands were more likely to continue with grazing of livestock, bee keeping and collection of wild fruits from the forest.

4.4 Implication of Gendered Involvement in Forest Governance and Use of Forest Resources on Livelihoods

The third objective of this study was to examine the implication of gendered involvement in forest governance as well as use of forest resources on livelihoods. Specifically, this section focused on the implication of gendered involvement in forest governance and use of forest resources on access to livelihood assets. It also examined how husbands and wives shared the money from forest governance and the sale of forest products.

4.4.1 Implication of gendered involvement in Community Forest Association activities and use of forest resources on livelihood

To achieve this sub-objective, the respondents were asked to state their level of agreement to the statements that: '*Do the involvement of both husbands and wives in CFA activities and use of forest resources has implication on the forest and livelihoods*'. The responses were analyzed and presented as shown in Table 4.8 below.

Table 4.8: Implication of engagement of husbands and wives in forest governance and use of forest resources on livelihoods

Statement	Gender	Level of Agreement					
		SD n (%)	D n (%)	N n (%)	A n (%)	SA n (%)	Mean score
E11. Involvement of both husbands and wives in reforestation and forest patrol has led to sufficient access to income.	M	61 (21.8)	42 (15.0)	28 (10.0)	7 (2.5)	2 (0.7)	1.91
	F	78 (27.9)	49 (17.5)	13 (4.6)	0 (0.0)	0 (0.0)	1.54
E12. Involvement of both husbands and wives in crop cultivation in the forest has led to sufficient access to food.	M	0 (0.0)	0 (0.0)	9 (3.2)	43 (15.4)	88 (31.4)	4.56
	F	0 (0.0)	0 (0.0)	16 (5.7)	51 (18.2)	73 (26.1)	4.41
E13. Involvement of both husbands and wives in the collection of pasture and grazing of animals in the forest has led to sufficient access to livestock feeds	M	0 (0.0)	0 (0.0)	33 (11.8)	68 (24.3)	39 (13.9)	4.04
	F	0 (0.0)	0 (0.0)	61 (21.8)	54 (19.3)	25 (8.9)	3.74
E14. Involvement of both husbands and wives in the collection of vegetables and fruits has led to sufficient access to food	M	63 (22.5)	32 (11.4)	29 (10.4)	16 (5.7)	0 (0.0)	1.99
	F	47 (16.8)	42 (15.0)	38 (13.6)	9 (3.2)	4 (1.4)	2.15
E15. Involvement of both husbands and wives in the collection of firewood from the forest has led to sufficient access to wood fuel	M	65 (23.2)	37 (13.2)	26 (9.3)	12 (4.3)	0 (0.0)	1.98
	F	39 (13.9)	24 (8.6)	43 (15.4)	28 (10.0)	6 (2.1)	2.56
E16. Involvement of both husbands and wives in the preparation of herbal medicine has led to sufficient access to herbal medicine	M	34 (12.1)	28 (10.0)	49 (17.5)	22 (7.9)	7 (2.5)	2.57
	F	23 (8.2)	55 (19.6)	31 (11.1)	18 (6.4)	13 (4.6)	2.59

Source: Field Survey (2021)

With regard to statement E11 – Involvement of both husbands and wives in reforestation and forest patrol has led to sufficient access to income, 2 (0.7 %) of the male respondents and none (0.0 %) of the female respondents 'Strongly Agreed', 7 (2.5 %) of the male respondents and 0 (0.0 %) of the female respondents 'Agreed', 28 (10.0 %) of the male respondents and 13 (4.6 %) of the female respondents were 'Neutral', 42 (15.0 %) of the male respondents and 49 (17.5 %) of the female respondents 'Disagreed', while 61 (21.8 %) of the male respondents and 78 (27.9 %) female respondents 'Strongly Disagreed'. As shown in Table 4.10, the mean score value for statement E11 for men was 1.91 which imply 'Disagree' while the mean

score value for women was 1.54 which indicates 'Strongly Disagree'. The mean score difference reveals that women were more likely than men to disagree with the view that the '*Involvement of both husbands and wives in reforestation and forest patrol has led to sufficient access to income*'. This revelation emphasizes that the gendered sharing of decision making powers and roles during reforestation and forest patrol had minimal effect on the access to income. This finding resembles the academic work of Tuijnman *et al* (2020) who reported that both men and women believed that the money earned through forest protection was insufficient for them and their households in Vietnam.

Through interviews, the extent to which the involvement of both husbands and wives in reforestation and forest patrol has led to sufficient access to income was assessed. For instance, male key respondent 9 opined that:

> *'The forest scouts who patrol the forest used to be remunerated by Nature Kenya on monthly basis. I remember this is back in 2013 and 2014 when we used to be given some money as token. But, since my wife is not a forest scout, I used to earn this money alone from my household.'* [KII-9, 2021]

In addition, female key respondent 13 observed that:

> *'I am one of the female scouts in this area. I joined this forest scouting team in 2015 when there used to be some token given to the forest scouts by Non-governmental organizations. But, my husband is not forest scout and thus he did not earn money from forest patrol.'* [KII-13, 2021]

The verbal revelations above negate the view that the involvement of both husbands and wives in reforestation and forest patrol has led to sufficient access to income because most of the forest scouts were mainly men. This revelation is in line with the findings of Tuijnman *et al* (2020) who observed that men dominated the role and decision making with regard to forest protection and management in Vietnam.

With regard to statement E12 – Involvement of both husbands and wives in crop cultivation in the forest has led to sufficient access to food, 88 (31.4 %) of the male respondents and 73 (26.1 %) of the female respondents 'Strongly Agreed', 43 (15.4 %) of the male respondents and 51 (18.2 %) of the female respondents 'Agreed', 9 (3.2 %) of the male respondents and 16 (5.7 %) of the female respondents were 'Neutral', none (0.0 %) of the male respondents and female respondents "Disagreed' nor 'Strongly Disagreed'. As presented in Table 4.8, the mean score value for statement E12 for men was 4.56 which demonstrates 'Agreement' while the mean score value for women was 4.41 which imply 'Agreement'. The mean scores reiterate that both men and women agreed to the view that the involvement of both husbands and wives in crop cultivation in the forest has led to sufficient access to food.

From the verbal expressions below, some of the respondents argued that the involvement of both men and women in the cultivation of crops in the forest had contributed to high crop yields. For instance, female key respondent 11 opined that:

> *'When I share roles of land preparation, planting, weeding, harvesting and transportation of crops with my husband the crop yields are relatively higher than when I cultivate alone. This is because we combine the financial resources needed to cultivate a large piece of land and hire workers to work on the PELIS farms.'* [KII-11, 2021]

Further, the male key respondent 7 noted that:

> *'I usually give my wife encouragement and financial support during land preparation, planting, weeding, harvesting and transportation. When the climatic conditions are favourable we experience high crop yields.'* [KII-7, 2021]

In relation to statement E13 – Involvement of both husbands and wives in the collection of pasture and grazing of animals in the forest has led to sufficient access to livestock feeds, 39 (13.9 %) of the male respondents and 25 (8.9 %) of the female

respondents ‘Strongly Agreed’, 68 (24.3 %) of the male respondents and 54 (19.3 %) of the female respondents ‘Agreed’, 33 (11.8 %) of the male respondents and 61 (21.8 %) of the female respondents were ‘Neutral’, and none (0.0 %) of the male respondents and female respondents ‘Disagreed’ nor ‘Strongly Disagreed’. As illustrated in Table 4.10, the mean score value of statement E13 for men was 4.04 which indicates ‘Agreement’ while mean score value for women was 3.74 which implies ‘Agreement’. The mean score difference indicates that both men and women agreed to the view that the involvement of both husbands and wives in the collection of pasture and grazing of animals in the forest has led to sufficient access to livestock feeds. Through interviews, it was revealed that the involvement of both husbands and wives in the collection of pasture and grazing of animals in the forest has led to sufficient access to livestock feeds, but also reduced the expenses on animal feeds during drought seasons.

On statement E14 – Involvement of both husbands and wives in the collection of vegetables and fruits has led to sufficient access to food, none (0.0 %) of the male respondents and 4 (1.4 %) of the female respondents ‘Strongly Agreed’, 16 (5.7 %) of the male respondents and 9 (3.2 %) of the female respondents ‘Agreed’, 29 (10.4 %) of the male respondents and 38 (13.6 %) of the female respondents were ‘Neutral’, 32 (11.4 %) of the male respondents and 42 (15.0 %) of the female respondents ‘Disagreed’ while 63 (22.5 %) of the male respondents and 47 (16.8 %) of the female respondents ‘Strongly Disagreed’. As indicated in Table 4.10, the mean score value of statement E14 for men was 1.99 which indicates ‘Disagree’ while mean score value for women was 2.15 which implies ‘Disagree’. The mean score values underscore that both men and women disagreed with the view that the involvement of both husbands and wives in the collection of vegetables and fruits

has led to sufficient access to food. Through interviews, it was argued that men did not engage in the collection nor made decisions regarding the collection of vegetables and fruits thus there was no sharing of roles and decision making during collection of vegetables and fruits. This revelation substantially concurs with the academic documentation of Kalanzi *et al* (2020) who argued that the decision-making of wives was critical in the provision of food to the household members in Uganda.

With regard to statement E15 – Involvement of both husbands and wives in the collection of firewood from the forest has led to sufficient access to wood fuel, none (0.0 %) of the male respondents and 6 (2.1 %) of the female respondents 'Strongly Agreed', 12 (4.3 %) of the male respondents and 28 (10.0 %) of the female respondents 'Agreed', 26 (9.3 %) of the male respondents and 43 (15.4 %) of the female respondents were 'Neutral', 37 (13.2 %) of the male respondents and 24 (8.6 %) of the female respondents 'Disagreed' while 65 (23.2 %) of the male respondents and 39 (13.9 %) of the female respondents 'Strongly Disagreed'. As shown in Table 4.10, the mean score value of statement E15 for men was 1.98 which indicates 'Disagree' while the mean score value for the women was 2.56 which imply 'Disagree'. The mean scores emphasize that both men and women disagreed with the assertion that the involvement of both husbands and wives in the collection of firewood from the forest has led to sufficient access to wood fuel.

The reasons as to why there was disagreement among the women with the perception that the involvement of both husbands and wives in the collection of firewood from the forest has led to sufficient access to wood fuel were established through interviews. It was emphasized that the women and the female children were the ones

who mainly collected firewood for domestic consumption. This finding concurs with the academic documentation of Sanjay (2017) who noted that women dominated the role of collecting firewood from the forest within Nuwakot District in Nepal.

In relation to statement E16 - Involvement of both husbands and wives in the preparation of herbal medicine has led to sufficient access to herbal medicine, 7 (2.5 %) of the male respondents and 13 (4.6 %) of the female respondents 'Strongly Agreed', 22 (7.9 %) of the male respondents and 18 (6.4 %) of the female respondents 'Agreed', 49 (17.5 %) of the male respondents and 31 (11.1 %) of the female respondents were 'Neutral', 28 (10.0 %) of the male respondents and 55 (19.6 %) of the female respondents 'Disagreed', while 34 (12.1 %) of the male respondents and 23 (8.2 %) of the female respondents 'Strongly Disagreed'. It is clear from Table 4.8 that the mean score value for statement E16 for men was 2.57 which imply 'Disagree' while the mean score value for women was 2.59 which indicates 'Disagree'. The mean scores confirm that both men and women disagreed to the view that the involvement of both husbands and wives in the preparation of herbal medicine has led to sufficient access to herbal medicine.

Through interviews, the extent to which the Involvement of both husbands and wives in the preparation of herbal medicine has led to sufficient access to herbal medicine was established. It was confirmed that most of the herbalists prepared herbal medicine to treat common ailments within the household and therefore helped to reduce expenses of purchasing manufactured drugs or going to the hospital for treatment. This finding agrees with the academic documentation of Matiku *et al* (2013) who confirm that the herbs collected from the forest are critical in saving the

expenses of purchasing the medicine and enhances earning of income from sale of herbal plants in Arabuko-Sokoke forest in Kenya.

4.4.2 Sharing and use of money from Community Forest Association activities and sale of forest products

This sub-section assessed how men and women shared the money from forest governance and the sale of forest products. The respondents were asked: '*How do you share the money obtained from forest governance and sale of forest products with your spouse*? From the analysis, the results were as illustrated in Figure 4.8 below.

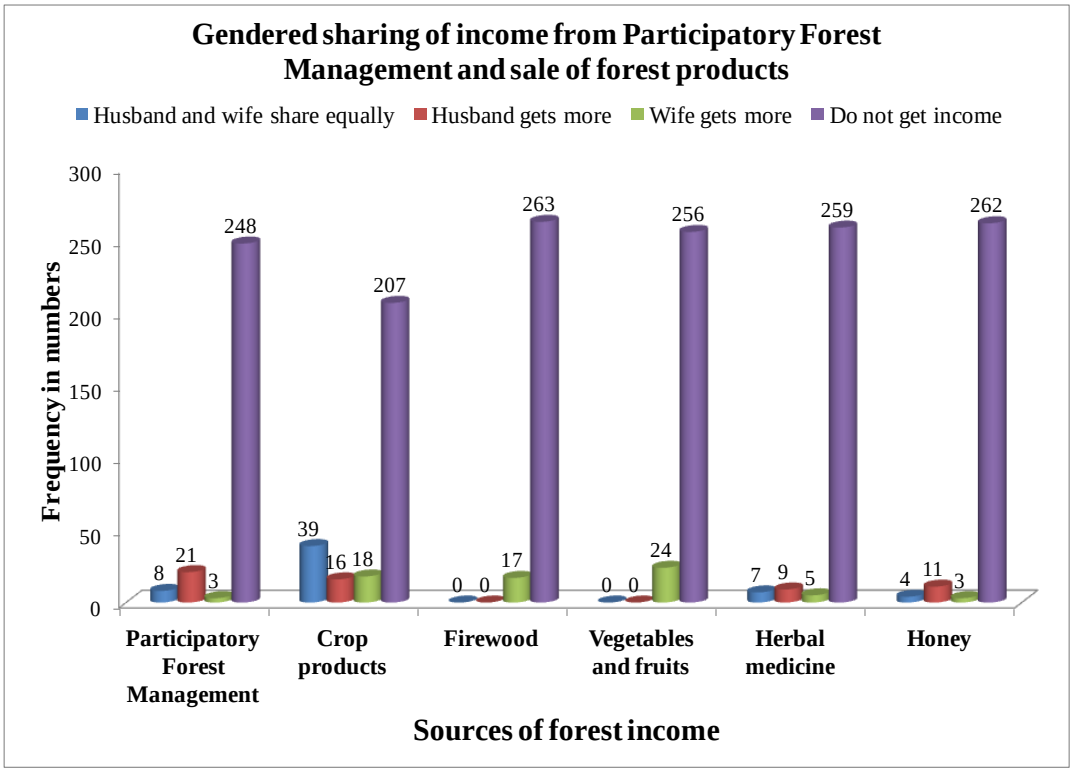

Figure 4.8: A bar graph representing gender sharing of income from forest governance and sale of products from the forest Source: Field Survey (2021)

The results indicated in Figure 4.8 show that 8 (2.9 %) of the respondents posited that the husbands and wives shared the income equally, 21 (7.5 %) of the respondents revealed that the husbands got more share of the money obtained from forest governance, 3 (1.1 %) of the respondents observed that the wives got more,

and 248 (88.6 %) of the respondents reported that they did not get any income from forest management. This finding emphasizes that there was ‘Minimal’ gender sharing of money from forest governance since more men than women got the highest share.

Some of the interviewed respondents emphasized that since men were the ones who mainly engaged in establishment and maintenance of tree nurseries as well as forest protection, they were likely to earn more and therefore receive the highest share than their wives. According to Mulbah (2021) about 8 in every 10 respondents in his doctoral study conducted in Liberia reported that they received money through direct payment for casual labour and forest protection. Further, the findings of present study agrees with the observations of Tuijnman *et al* (2020) who observed that men controlled the income obtained from the forest management and protection at the household level in Vietnam. This is attributed to the argument that women did not gain income directly from the forest management since most of the money was paid to the husbands (Tuijnman *et al.,* 2020).

From Figure 4.8 above, 39 (13.9 %) of the respondents noted that the husbands and wife shared the money obtained from the sale of crop products equally, 16 (5.7 %) of the respondents argued that the husbands got more, 18 (6.4 %) of the respondents revealed that the wives got the highest share, and 207 (73.9 %) of the respondents advanced that they did not sell the crop products. This result underlines that although the husbands received the largest proportion of the money received from the sale of crop products, there was evidence that the husbands and wives shared the money from sale of crop products equally.

The respondents were asked how the money obtained from the sale of forest products was used and male key respondent number 11 quipped that:

> *'I usually use the money obtained from the sale of forest products such as crop products to pay the farm labourers and the remaining amount use it pay for transport when I have to travel to Kapcherop Township.'* [KII-11, 2021]

On the other hand, female key respondent number 5 opined that:

> *'I use the money to buy household items such as sugar as well as buy cloth for my children, pay tithe in church, pay for the 'Chama' and the remaining I save for future use.'* [KII-5, 2021]

From the narratives above, it is clear that husbands used the money from sale of crop products to pay farm workers as well as to cater for transport to the nearby town centre while the wives used the money to purchase household items, buy cloth for their children, pay contributions for the social group and religious institutions and saved the money for future use. These two revelations imply that there exist gender differences in terms of use of money from sale of crop products. This revelation concurs substantially with the documentation of Nabanoga (2005) who advanced that husbands and wives had equal powers in decision making about how the income from the forest is used.

The results shown in Figure 4.8 above indicate that 17 (6.1 %) of the respondents confirmed that wives received more money from the sale of the firewood while 263 (93.9 %) of the respondents said that they did not sell the firewood. This underscores that women received the largest proportion of the income secured from the sale of firewood and this was attributed to the fact that the collection and selling of firewood was mainly done by women. When some of the firewood collectors were asked how they use the money obtained from the sale of firewood, it was noted that they used the money to buy basic household items. Through interviews, it was further confirmed that a large number of the female respondents that collected firewood

were small-scale firewood collectors and therefore used the collected firewood to meet the household energy needs.

As shown in Figure 4.8 above 24 (8.6 %) of the respondents revealed that wives received a larger share of the money received from the sale of the wild vegetables while 256 (91.4 %) of the respondents observed that they did not sell the wild vegetables and fruits. This implies that women received the highest proportion of the money obtained from the sale of wild vegetables and fruits. Through interviews, it was reported that this gendered differences was due to the revelation that the collection and selling of wild vegetables was mainly done by women because they had more information about the household vegetable needs. Through interviews, it was noted that the money obtained from vegetable sales was used to buy other food items within the household. It was also noted through interviews that much of the vegetables and fruits collected from the forest was not sold but consumed at the household level and helped to supplement for the food nutrients. While accounting for the collection of indigenous vegetables from the forest, female key respondent number 5 quipped that:

> *'If I do not collect the vegetables from the forest I will be forced to buy at the market or neighbours. I am the one that is supposed to prepare food while my husband provides the money to buy other household items.'* [KII-5, 2021]

The verbal expression above indicates that women were motivated to engage in collection of indigenous vegetables from the forest to save the money that would have been used to buy the vegetables at the market or from the neighbours.

It is clear from Figure 4.8 above that 7 (2.5 %) of the respondents observed that the husbands and wives shared the money equally from sale of herbal medicine, 9 (3.2 %) of the respondents noted that the husbands received the largest share, 5 (1.8 %) of

the respondents revealed that the wives received more income whereas 259 (92.5 %) of the respondents posited that they did not sell the herbal medicine. This highlights that there was gender sharing of income from the sale of herbal medicine equally within some households. Although both the men and the women participated in the collection of herbs and processing of the herbal medicine, it was established through interviews that the women were the ones who engaged in the selling of the herbal medicine and therefore had more right over how much income was to be shared with their male spouses. Through interviews, it was revealed that a large number of the respondents did not sell the herbal medicine because there were very few herbalists among the respondents of this study. Moreover, the money obtained from the sale of herbal medicine was mainly used to buy basic household items and cater for transport costs.

The results presented in Figure 4.8 above reveal that 4 (1.4 %) of the respondents argued that the husbands and wives shared the money obtained from the sale of honey in equal proportion, 11 (3.9 %) of the respondents advanced that husbands received the more share of the income from the sale of honey, 3 (1.1 %) of the respondents posited that the wives got more and 262 (93.6 %) of the respondents reported that they did not sell the honey. This suggests that although there was gender sharing of income from the sale of honey on equal terms, more men than women received the highest amount of this money in comparison to women. This revelation resembles the academic documentation of Silvano & Kweka (2020) who advanced that men obtained more money than women because the engagement in forest related livelihood activities such as bee keeping by men generated more income within Kilwa District in Tanzania.

It was revealed through interviews that the men had more right over the amount of money shared since they were the ones who hanged the bee-hives and harvested the honey which was believed to be tedious while the women mainly engaged in the processing and selling of the honey. A large proportion of the respondents did not sell the honey because in this study there were very few members of bee-keepers forest user group. It was confirmed that the money obtained from the sale of honey was used to cater for transport needs and purchase of household items.

4.4.3 Summary of the section

This section summarizes the implication of gendered involvement of husbands and wives in CFA and use of forest resources within Cherangany Hills Forest in Kenya. There was strong evidence that the intra-household gendered decision making powers and roles promoted access to food within the forest. Also, the intra-household gendered decision making powers and roles promoted access to pasture for livestock. But, the intra-household gendered decision making powers had insignificant effect on access to vegetable and fruits, firewood, and herbal medicine.

With regard to sharing of income from CFA activities and sale of forest products, the results show that there was minimal intra-household sharing of income from sale of forest products. The income from forest products was used for individual benefits as well as for the household.

4.5 Constraints and Opportunities for Husbands and Wives Engaging in Community Forest Association Activities

The fourth objective of this study was to assess the constraints and opportunities for husbands and wives engaging in Community Forest Association activities. Under the ‘Gender Box’ theoretical framework, Colfer & Minarchek (2013) advance that the

factors that influence the gender involvement in forest governance and use of forest resources can be examined at three levels namely; micro-scale, meso-scale and macro-scale. Borrowing from these arguments, the challenges and opportunities were examined at micro-scale level (intra-household gender relations and time constraints), meso-scale level (financial challenges, distance from forest boundary and inadequate access to forest information and training) and macro-scale level (gender norms of behaviour) as discussed below.

4.5.1 Intra-household gender relations

In their 'Gender Box' theoretical framework, Colfer & Minarchek (2013) assert that intra-household power dynamics is manifested in women's 'vulnerability to force' and intra-household bargaining. Guided by these ideas, the study aimed to establish the extent to which intra-household gender relations influenced the involvement of men and women in forest governance and exploitation of forest resources (Samndong & Kjosavik, 2017). To achieve this, the respondents were asked to state their level of agreement to the statements that were related to how intra-household gender relations hindered their involvement in forest governance. The collected data was analyzed and presented as shown in Table 4.9 below.

With regard to statement F11 - You do not attend CFA meetings because your spouse has discouraged you. None (0.0 %) of the male respondents and 4 (1.4 %) of the female respondents 'Strongly Agreed', none (0.0 %) of the male respondents and 9 (3.2 %) of the female respondents 'Agreed', 27 (9.6 %) of the male respondents and 36 (12.9 %) of the female respondents were 'Neutral', 42 (15.0 %) of the male respondents and 53 (18.9 %) of the female respondents 'Disagreed' while 71 (25.4 %) of the male respondents and 38 (13.6 %) of the female respondents 'Strongly

Disagree'. As demonstrated in Table 4.9, the mean score value of statement F11 for men was 1.70 which indicates 'Strongly Disagree' while the mean score value for the women was 2.20 which imply 'Disagree'. The mean scores imply that women were more likely than men to agree to the view that they did not attend forest related meetings due to discouragement from their spouses.

Table 4.9: Level of agreement to the view that intra-household gender relations hinder the involvement of men and women in forest governance

Statement	Gender	Level of Agreement					
		SD n (%)	D n (%)	N n (%)	A n (%)	SA n (%)	Mean score
F11. You do not attend CFA meetings because your spouse has discouraged you	M	71 (25.4)	42 (15.0)	27 (9.6)	0 (0.0)	0 (0.0)	1.70
	F	38 (13.6)	53 (18.9)	36 (12.9)	9 (3.2)	4 (1.4)	2.20
F12. You do not speak during forest meetings because your spouse will rebuke you	M	79 (28.2)	37 (13.2)	24 (8.6)	0 (0.0)	0 (0.0)	1.61
	F	43 (15.4)	36 (12.9)	32 (11.4)	17 (6.1)	12 (4.3)	2.42
F13. You do not seek leadership roles within the forest organizations because your spouse has discouraged you	M	31 (11.1)	52 (18.6)	38 (13.6)	14 (5.0)	5 (1.8)	2.36
	F	27 (9.6)	33 (11.8)	36 (12.9)	31 (11.1)	13 (4.6)	2.79
F14. You do not engage in forest patrol because your spouse has discouraged you	M	32 (11.4)	48 (17.1)	37 (13.2)	14 (5.0)	9 (3.2)	2.43
	F	62 (22.1)	35 (12.5)	21 (7.5)	18 (6.4)	4 (1.4)	2.05
F15. You do not participate in tree maintenance within the forest because your spouse has discouraged you	M	56 (20.0)	42 (15.0)	38 (13.6)	4 (1.4)	0 (0.0)	1.93
	F	53 (18.9)	49 (17.5)	36 (12.9)	2 (0.7)	0 (0.0)	1.91
F16. You do not engage in the exploitation of some non-timber forest resources because your spouse has discouraged you	M	58 (20.7)	37 (13.2)	21 (7.5)	19 (6.8)	5 (1.8)	2.11
	F	64 (22.9)	42 (15.0)	18 (6.4)	16 (5.7)	0 (0.0)	1.90

Source: Field Survey (2021)

Through interviews, some of the reasons as to why a few of male CFA members discouraged their spouses from attending forest related meetings were established. For instance, male key respondent 7 observed that:

> '*I sometimes discourage my wife from attending forest meetings that are held very far from our home since it requires more time and financial resources to travel. Also, I discourage her from attending the forest meetings if they are held in the morning during week days*

> *because there are numerous domestic tasks to be performed such as taking care of the children and feeding of the livestock.'* [KII-7, 2021]

The sentiments above indicate that some of the male CFA members discouraged their wives from attending the CFA meetings due to; long distance to the venue of meetings, the time when the forest meetings were held and the need to perform household tasks. The finding of the current study resembles substantially with the revelation of Samndong & Kjosavik (2017) and Onzere *et al* (2020) who contended that some women were denied permission by their husbands to attend forest user group meetings and forest related meetings in the DRC and Liberia. Through interviews, it was noted that some of the female CFA members dealt with this challenge by adopting intra-household bargaining strategies as well as employed domestic workers so that they are able to attend the CFA meetings as advanced by Colfer & Minarchek (2013) in their 'Gender Box' theoretical framework.

In relation to statement F12 - You do not speak during forest meetings because your spouse will rebuke you, none (0.0 %) of the male respondents and 12 (4.3 %) of the female respondents 'Strongly Agreed', none (0.0 %) of the male respondents and 17 (6.1 %) of the female respondents 'Agreed', 24 (8.6 %) of the male respondents and 32 (11.4 %) of the female respondents were 'Neutral', 37 (13.2 %) of the male respondents and 36 (12.9 %) of the female respondents 'Disagreed', while 79 (28.2 %) of the male respondents and 43 (15.4 %) of the female respondents 'Strongly Disagree'. It is clear from Table 4.9 that the mean score value for statement F12 for men was 2.42 which imply 'Strongly Disagree' while the mean score value for women was 1.61 which indicates 'Disagree'. The mean score difference confirms that women were more likely than men not to speak during the CFA meetings because they will be rebuked by their spouses if they spoke.

Through interviews, the reasons for discouragement of spouses from speaking during the CFA meetings were established. Some of the women noted that their husbands discouraged them from speaking during meetings because the opinion of women was largely ignored. Although women were accorded the necessary opportunities to speak during forest meetings in Nepal and Zimbabwe, Lewark *et al* (2011) and Mashapa *et al* (2020) confirm that there was low engagement of women in community forest management in Nepal and Zimbabwe since the opinion of the women were either disregarded or given less priority**.** Through interviews, it was revealed that some of the female CFA members minimized the challenge of discouragement from their spouses through sharing their opinions with the female CFA leaders so that they could raise the concerns on their behalf.

With regard to statement F13 - You do not seek leadership roles within the forest organizations because your spouse has discouraged you, 5 (1.8 %) of the male respondents and 13 (4.6 %) of the female respondents 'Strongly Agreed', 14 (5.0 %) of the male respondents and 31 (11.1 %) of the female respondents 'Agreed', 38 (13.6 %) of the male respondents and 36 (12.9 %) of the female respondents were 'Neutral', 52 (18.6 %) of the male respondents and 33 (11.8 %) of the female respondents 'Disagreed' while 31 (11.1 %) of the male respondents and 27 (9.6 %) of the female respondents 'Strongly Disagree'. As presented in Table 4.9, the mean score value for statement F13 for men was 2.36 which demonstrates 'Disagree' while the mean score value for women was 2.79 implies 'Neutral'. The mean score difference reiterates that women were more likely than men not to seek leadership roles within the CFA due to discouragement from their spouses. This revelation resembles the academic work of Evans *et al* (2020) who reported that women leaders

of the community forest organizations were physically abused by their spouses to discourage them from engaging in forest management in Nicaragua.

Through interviews, it was established that some men discouraged their wives from taking up CFA leadership positions due to the fact that the responsibilities of leaders in the CFA were considered to be demanding and required a lot of travelling. In order to resolve the issue of discouragement from the husbands, some of the female CFA leaders confirmed that they had to bargain with their spouses. Specifically, the women requested their male spouses to allow them occupy the CFA leadership positions but they would only attend the forest related meetings that were held within the locality. This revelation confirms the argument of Agarwal (2001) that there is intra-household bargaining for '*greater freedom to participate publicly*' in community forestry in South Asia.

In relation to statement F14 - You do not engage in forest patrol because your spouse has discouraged you, 9 (3.2 %) of the male respondents and 4 (1.4 %) of the female respondents 'Strongly Agreed', 14 (5.0 %) of the male respondents and 18 (6.4 %) of the female respondents 'Agreed', 37 (13.2 %) of the male respondents and 21 (7.5 %) of the female respondents were 'Neutral', 48 (17.1 %) of the male respondents and 35 (12.5 %) of the female respondents 'Disagreed' while 32 (11.4 %) of the male respondents and 62 (21.1 %) of the female respondents 'Strongly Disagree'. As illustrated in Table 4.9, the mean score value of statement F14 for men was 2.43 which reveal 'Disagree' while mean score value for women was 2.05 which indicates 'Disagree'. The mean score values underscore that both men and women were likely to disagree with the opinion that they did not participate in forest patrol due to discouragement from their spouses. While examining the reasons as to why

some of the female spouses discouraged their male counterparts from participating in forest patrol, female key respondent 7 revealed that:

> '*The forest patrols that are done at night are very risky. Some of the illegal forest users are usually armed and can harm the forest scouts. I am usually worried when my husband tells me he is going for forest patrol at night without the company of forest guards. During the rainy seasons, it is very uncomfortable to walk in the forest at night because you can slide and fall in the mud.'* [KII-7, 2021]

The revelation above implies that the main reasons for women discouraging their spouses from engaging in forest patrol was attributed to the argument that some of the illegal forest users were armed, the forest guards were absent during some night forest patrols and heavy rainfall hampers movement within the forest at night. This finding concurs with the observation of Okumu (2017) who reiterates that the illegal loggers took advantage of high rainfall to cut trees since there are minimal forest patrols during that time within the Mau Forest Ecosystem in Kenya. It was established during the interviews that the men that were discouraged from engaging in forest patrol by their wives noted that they solved the challenge by mainly participating in forest patrols during the day and sometimes in the evening during the dry seasons in a company of other forest scouts and forest guards.

In terms of statement F15 - You do not participate in the maintenance of trees within the forest because your spouse has discouraged you, none (0.0 %) of the male respondents nor female respondents 'Strongly Agreed', 4 (1.4 %) of the male respondents and 2 (0.7 %) the female respondents noted that they 'Agreed', 38 (13.6 %) of the male respondents and 36 (12.9 %) of the female respondents revealed that they were 'Neutral', 42 (15.0 %) of the male respondents and 49 (17.5 %) of the female respondents 'Disagreed' while 56 (20.0 %) of the male respondents and 53 (18.9 %) of the female respondents 'Strongly Disagree'. According to the results

shown in Table 4.9, the mean score value of statement F15 for men was 1.93 indicates ‘Disagree’ while mean score value for women was 1.91 which reveals ‘Disagree’. The mean score values underline that both men and women were likely to oppose the view that they did not to engage in monitoring and taking care of trees within the forest due to discouragement from their spouses.

It was revealed through interviews that some women discouraged their spouses from taking care of trees growing under the PELIS programme due to indiscriminate felling of the trees in forest by illegal forest users and powerful individuals. This revelation resembles greatly the observations of other scholars who noted that political patronage and corruption within forest departments discouraged some forest adjacent communities to engage in forest management programmes (Chomba *et al*., 2015; Mashapa *et al*., 2020; Mohammed & Inoue, 2012; Thygesen *et al*., 2016). However, some of the male CFA members noted that they engaged in the monitoring of trees to protect the forest because the forest is part of their cultural heritage.

On statement F16 - You do not engage in the exploitation of forest resources since your spouse has discouraged you, 5 (1.8 %) of the male respondents and none (0.0 %) of the female respondents ‘Strongly Agreed’, 19 (6.8 %) of the male respondents and 16 (5.7 %) of the female respondents ‘Agreed, 21 (7.5 %) of the male respondents and 18 (6.4 %) of the female respondents were ‘Neutral, 37 (13.2 %) of the male respondents and 42 (15.0 %) of the female respondents ‘Disagreed’ while 58 (20.7 %) of the male respondents and 64 (22.9 %) of the female respondents ‘Strongly Disagree’. From Table 4.9, the mean score index of statement F16 for men was 2.11 indicates ‘Disagree’ as well as the mean score value for women was 1.90 which implies ‘Disagree’. The mean score difference reiterates that both men and

women disagreed with the opinion that they did not engage in the exploitation of forest resources since their spouses had discouraged them. Through interviews, it was revealed that since the forest products were critical to the household wellbeing there was no form of spousal discouragement in relation to use of forest resources.

4.5.2 Time constraints

The engagement of men and women in livelihood activities and domestic chores greatly reduces the time available to engage in forest management and exploitation of forest resources (Manginsela, 2016; Rocheleau, 1995). The respondents were requested to state their level of agreement to the statement that time was a constraint to their involvement in forest governance and exploitation of forest resources. The collected data was analyzed and presented as shown in Table 4.10 below.

Table 4.10: Level of agreement to the view that time constraints hinder involvement of men and women in forest governance and use of forest resources

Statement	Gender	Level of Agreement					
		SD n (%)	D n (%)	N n (%)	A n (%)	SA n (%)	Mean score
F21. You sometimes fail to attend CFA meetings because you are very busy	M	0 (0.0)	0 (0.0)	51 (18.2)	47 (16.8)	42 (15.0)	3.94
	F	0 (0.0)	0 (0.0)	23 (8.2)	79 (28.2)	38 (13.6)	4.11
F22. You do not seek CFA leadership positions due to time limitations	M	5 (1.8)	12 (4.3)	48 (17.1)	41 (14.6)	34 (12.1)	3.62
	F	7 (2.5)	19 (6.8)	35 (12.5)	32 (11.4)	47 (16.8)	3.66
F23. You do not participate in forest patrol due to insufficient time	M	2 (0.7)	17 (6.1)	52 (18.6)	38 (13.6)	31 (11.1)	3.56
	F	14 (5.0)	32 (11.4)	29 (10.4)	44 (15.7)	21 (7.5)	3.19
F24. You sometimes fail to monitor the planted trees due to inadequate time	M	16 (5.7)	28 (10.0)	41 (14.6)	43 (15.4)	12 (4.3)	3.05
	F	21 (7.5)	24 (8.6)	31 (11.1)	16 (5.7)	48 (17.1)	3.33
F25. You do not engage in the exploitation of non-timber forest products due to time constraints	M	63 (22.5)	16 (5.7)	21 (7.5)	37 (13.2)	3 (1.1)	2.29
	F	56 (20.0)	54 (19.3)	28 (10.0)	2 (0.7)	0 (0.0)	1.83

Source: Field Survey (2021)

In relation to statement F21 - You sometimes fail to attend forest meetings because you are very busy, 42 (15.0 %) of the male respondents and 38 (13.6 %) of the

female respondents ‘Strongly Agreed’, 47 (16.8 %) of the male respondents and 79 (28.2 %) of the female respondents ‘Agreed’, 51 (18.2 %) of the male respondents and 23 (8.2 %) of the female respondents were ‘Neutral’, none (0.0 %) of the male respondents and female respondents ‘Disagreed’ or ‘Strongly Disagreed’. The results presented in Table 4.10 reveal that the mean score value of statement F21 for women was 4.11 which indicates ‘Agree’ while the mean score value for men was 3.94 which implies ‘Agree’. The mean score values emphasize that both men and women were likely not to attend forest related meetings since they were busy performing livelihood activities and household tasks respectively.

While establishing how the engagement in livelihood activities contributed to occasional attendance of CFA meetings among the female CFA members, female key respondent 2 observed that: ‘*I rarely attend the CFA meetings since I am always held up running my small scale business at Kamoi Market Centre.’* The opinion above underscores that some of the female CFA members did not attend the CFA meetings due to involvement in Non-forest livelihood activities. Studies conducted in the DRC and Nepal corroborate that women rarely attended the forest meetings due to time constraints associated with engagement in household tasks and livelihood activities (Baral, 2014; Samndong & Kjosavik, 2017). Through interviews, some of the women argue that they minimized the challenge of time constraints by getting assistance from their daughters and relatives. Some women in Indonesia delegated the duties of child care and domestic tasks (such as collecting firewood, fetching water, cleaning and cooking) to their older daughters and relatives (Manginsela, 2016).

With regard to statement F22 - You do not seek leadership positions due to time constraints, 34 (12.1 %) of the male respondents and 47 (16.8 %) of the female respondents ‘Strongly Agreed’, 41 (14.6 %) of the male respondents and 32 (11.4 %) of the female respondents ‘Agreed’, 48 (17.1 %) of the male respondents and 35 (12.5 %) of the female respondents were ‘Neutral’, 12 (4.3 %) of the male respondents and 19 (6.8 %) of the female respondents ‘Disagreed’ while 5 (1.8 %) of the male respondents and 7 (2.5 %) of the female respondents ‘Strongly Disagreed’. It is clear from Table 4.10 that the mean score value of statement F22 for men was 3.62 which imply ‘Agree’ while mean score value for women was 3.66 which demonstrate ‘Agree’. The mean score values underscore that both men and women were likely not to seek leadership positions due to time constraints.

Through interviews, it was noted that women engaged in domestic tasks such as fetching water, cultivation of the land, feeding the livestock, cleaning and washing as well as taking care of children while the men participated in feeding animals, cultivation of farms and building and construction activities. Studies from Kenya, Zimbabwe and Liberia corroborate that women indicated low level of engagement in forest management programmes due to gender ascribed tasks such as child care, cooking, fetching water and firewood, and farming (Mashapa *et al*., 2020; Musyoki *et al*., 2013; Onzere *et al.*, 2020).

On statement F23 - You do not participate in forest patrol due to insufficient time, 31 (11.1 %) of the male respondents and 21 (7.5 %) of the female respondents ‘Strongly Agreed’, 38 (13.6 %) of the male respondents and 44 (15.7 %) of the female respondents ‘Agreed’, 52 (18.6 %) of the male respondents and 29 (10.4 %) of the female respondents were ‘Neutral’, 17 (6.1 %) of the male respondents and 32 (11.4

%) of the female respondents ‘Disagreed’ while 2 (0.7 %) of the male respondents and 14 (5.0 %) of the female respondents ‘Strongly Disagreed’. As indicated in Table 4.10, the mean score value to statement F23 for men was 3.56 which reveals ‘Agree’ while the mean score value for women was 3.19 which indicates ‘Neutral’. The mean score values infer that men were more likely than women to agree to the view that they do not to participate in forest patrols due to limited time.

While accounting for the gender differences in how limited time was a constraint to the involvement of men and women in forest patrol, male key respondent 9 opined that:

> ‘*Sometimes I do not have time to go for forest patrol especially when I have to attend to other social activities such as funerals and socializing with friends in the evening. When I visit relatives residing in far places and come home very late, I usually do not engage in forest patrol.’* [KII-9, 2021]

The narrative above reiterates that some of the men encountered time constraints when participating in forest patrols due to attendance of social functions.

On statement F24 - Time is a constraint to engagement in monitoring the planted trees, 12 (4.3 %) of the male respondents and 48 (17.1 %) of the female respondents ‘Strongly Agreed’, 43 (15.4 %) of the male respondents and 16 (5.7 %) of the female respondents ‘Agreed’, 41 (14.6 %) of the male respondents and 31 (11.1 %) of the female respondents were ‘Neutral’, 28 (10.0 %) of the male respondents and 24 (8.6 %) of the female respondents ‘Disagreed’ while 16 (5.7 %) of the male respondents and 21 (7.5 %) of the female respondents ‘Strongly Disagreed’. Table 4.10 highlights that the mean score value for statement F24 for men was 3.05 which imply ‘Neutral’ while the mean score value for women was 3.33 which indicate ‘Neutral’. The mean score difference demonstrates that both men and women were

‘unsure’ to the view that they did not engage in the monitoring of planted trees within the forest due to inadequate time. Through interviews, it was noted that the involvement in household chores contributed greatly to the time constraints for the involvement of women in monitoring of the trees within the PELIS plots in the forest. While confirming the above results, Banana *et al* (2012) reiterate that heavy household chores accounted for the lack of women involvement in tree planting programmes in Uganda.

On statement F25 - You do not engage in the exploitation of some non-timber forest products due to time constraints, 3 (1.1 %) of the male respondents and none (0.0 %) of the female respondents ‘Strongly Agreed’, 37 (13.2 %) of the male respondents while 2 (0.7 %) of the female respondents ‘Agreed, 21 (7.5 %) of the male respondents and 28 (10.0 %) of the female respondents were ‘Neutral, 16 (5.7 %) of the male respondents and 54 (19.3 %) of the female respondents ‘Disagreed’ while 63 (22.5 %) of the male respondents and 56 (20.0 %) of the female respondents ‘Strongly Disagreed’. As shown in Table 4.10, the mean score value of statement F25 for men was 2.29 which indicates ‘Disagree’ and the mean score index for women was 1.83 which demonstrates ‘Disagree’. The mean score difference advances that both men and women were likely to disagree the view that time was a constraint to the exploitation of forest resources. During interviews, most of the respondents engaged in exploitation of forest resources at their free time.

4.5.3 Financial constraints

Documented evidence demonstrates that limited financial resources and mismanagement of CFA financial resources discourages the involvement of men and women in forest governance (Mutune *et al.,* 2015; Okumu, 2017). Guided by this

literature, the respondents were asked: *What is your level of agreement to the opinion that financial challenge is a hindrance to your involvement in the forest governance and exploitation of forest resources*? The collected data was analyzed and presented as shown in Table 4.11 below.

Table 4.11: Level of agreement with the view that financial challenge is a constraint to involvement of men and women in forest governance and exploitation of forest resources

Statement	Gender	Level of Agreement					
		SD n (%)	D n (%)	N n (%)	A n (%)	SA n (%)	Mean score
F31. You fail to pay for the CFA subscription fees due to limited finances	M	38 (13.6)	24 (8.6)	36 (12.9)	33 (11.8)	9 (3.2)	2.65
	F	42 (15.0)	27 (9.6)	31 (11.1)	18 (6.4)	22 (7.9)	2.65
F32. You do not pay the CFA membership subscription fees due to mismanagement of CFA finances	M	25 (8.9)	21 (7.5)	34 (12.1)	37 (13.2)	23 (8.2)	3.09
	F	29 (10.4)	24 (8.6)	18 (6.4)	33 (11.8)	36 (12.9)	3.16
F33. You do not engage in the maintenance of tree seedlings due to poor remuneration by the CFA	M	18 (6.4)	35 (12.5)	31 (11.1)	37 (13.2)	19 (6.8)	3.03
	F	16 (5.7)	29 (10.4)	36 (12.9)	35 (12.5)	24 (8.6)	3.16
F34. You do not engage in forest patrol due to poor remuneration by the CFA	M	13 (4.6)	18 (6.4)	22 (7.9)	41 (14.6)	46 (16.4)	3.64
	F	21 (7.5)	24 (8.6)	27 (9.6)	43 (15.4)	25 (8.9)	3.19
F35. You do not engage in the exploitation of forest resources due to inadequate funds to pay for permits	M	36 (12.9)	31 (11.1)	29 (10.4)	26 (9.3)	18 (6.4)	2.71
	F	26 (9.3)	19 (6.8)	35 (12.5)	38 (13.6)	22 (7.9)	3.08

Source: Field Survey (2021)

With regard to statement F31 - You sometimes fail to pay for the CFA subscription fees due to limited finances, 9 (3.2 %) of the male respondents and 22 (7.9 %) of the female respondents ‘Strongly Agreed’, 33 (11.8 %) of the male respondents and 18 (6.4 %) of the female respondents ‘Agreed’, 36 (12.9 %) of the male respondents and 31 (11.1 %) of the female respondents were ‘Neutral’, 24 (8.6 %) of the male respondents and 27 (9.6 %) of the female respondents ‘Disagreed’, and 38 (13.6 %)

of the male respondents and 42 (15.0 %) of the female respondents 'Strongly Disagree'. As indicated in Table 4.11, the mean score value of statement F31 for both men and women was equal to 2.65 and this indicate 'Neutral'. This equality in mean score values reiterate that both men and women were unsure as to whether they failed to pay the CFA membership subscription fees by limited finances. The results of the current study resembles the academic documentation of other studies which pointed out that inadequate funds hindered some of the forest adjacent communities especially women to join and pay for the membership and subscription fees of forest organizations in Kenya and the DRC (Kimutai & Watanabe, 2016; Mutune *et al*., 2015; Samndong & Kjosavik, 2017). While establishing how the women resolved the financial challenge, during the interviews some of the female CFA members posited that their husbands paid the CFA subscription fee for them. It was also revealed that siblings were more likely to pay the CFA membership subscription fees for the female CFA members than the male CFA members.

In relation to statement F32 – You sometimes do not pay the CFA membership subscription fees due to mismanagement of CFA finances, 23 (8.2 %) of the male respondents and 36 (12.9 %) of the female respondents 'Strongly Agreed', 37 (13.2 %) of the male respondents and 33 (11.8 %) of the female respondents 'Agreed', 34 (12.1 %) of the male respondents and 18 (6.4 %) of the female respondents were 'Neutral', 21 (7.5 %) of the male respondents and 24 (8.6 %) of the female respondents 'Disagreed' while 25 (8.9 %) of the male respondents and 29 (10.4 %) of the female respondents 'Strongly Disagreed'. As shown in Table 4.11 the mean score value of statement F32 for men was 3.09 which indicate 'Neutral' while mean score value for women was 3.16 which imply 'Neutral'. The mean score indices reveal that both men and women were 'unsure' to the view that they did not pay the

CFA membership subscription fees due to mismanagement of CFA finances by the CFA leaders.

During the interviews, male key respondent 7 observed that:

> '*When we established the CFA in 2012 most members used to pay the subscription fees on time. However, after sometime we realized that some of the CFA leaders were embezzling the CFA finances. Due to this embezzlement of the CFA finances, I stopped paying the CFA fees two years ago*.' [KII-7, 2021]

The narrative above implies that some of CFA members stopped paying the CFA fees due to mismanagement of CFA financial resources by the CFA leaders. This result is in line with the documentation of Okumu (2017) and Anaka (2018) who reported that some members of the forest organizations stopped paying their membership fees due to lack of transparency in the management of financial resources. To resolve this problem, it was established through interviews that some of the CFA members stopped attending CFA meetings, other CFA members demanded for the financial records to be tabled by the CFA leaders as well as advocated for the removal of all the CFA leaders who were believed to have embezzled the CFA finances.

In relation to statement F33 – You sometimes do not engage in the maintenance of tree seedlings due to poor remuneration by the CFA, 19 (6.8 %) of the male respondents and 24 (8.6 %) of the female respondents 'Strongly Agreed', 37 (13.2 %) of the male respondents and 35 (12.5 %) of the female respondents 'Agreed', 31 (11.1 %) of the male respondents and 36 (12.9 %) of the female respondents were 'Neutral', 35 (12.5 %) of the male respondents and 29 (10.4 %) of the female respondents 'Disagreed' while 18 (6.4 %) of the male respondents and 16 (5.7 %) of the female respondents 'Strongly Disagree'. As highlighted in Table 4.11, the mean score value for statement F33 for men was 3.03 which reveal 'Neutral' while mean

score value for women was 3.16 which indicate ‘Neutral’. The mean score values indicate that both men and women were ‘unsure’ with the view that they did not engage in the maintenance of tree nurseries due to inadequate CFA financial resources.

While establishing the factors that contributed to the inadequate CFA finances, some of the interviewed respondents revealed the following: (i) The Kenya Forest Service has failed to finance the CFA activities (ii) The Kenya Forest Service has failed to implement the PFM agreements (iii) There is disagreement between the Kenya Forest Service and the CFA which has led to lack of money.

Further, it was revealed that inadequate CFA finances discouraged both CFA members and leaders from engaging in forest governance since according to some respondents insufficient CFA finances contributed to: (i) Unstable source of finances to motivate the CFA leaders to go to the office to address the CFA matters (ii) Forest scouts are also affected because they rely on the motivations from the CFA funds and therefore the scouts fail to give information about illegal forest activities such as charcoal burning and illegal loggers (iii) When the CFA leaders have no money for transport and lunch because the finances from the subscription was believed to be very little. This finding concurs with the observations of Kimutai & Watanabe (2016) who emphasized that unreliable source of CFA funds hampered the payment of workers who engaged in the preparation, maintenance and management of tree nurseries.

However, when male key respondent 5 was asked how the problem of inadequate CFA funds could be solved he proposed that:

> *'..(i) There is need to implement the PFM Agreement (whereby the permit fee paid to KFS in order to gain access to forest resources a certain percentage should be channelled to the CFA) (ii) There is need to bring donors from various forest organizations to finance the CFA activities such as establishment of tree nurseries, payment of the forest scouts, to cater for transport during the forest patrols, and purchase computers. (iii) There is need for the CFA leaders to do capacity building by educating the members and request livelihood projects where there is encroachment of the forest*.' [KII-5, 2021]

Some of these proposals are in line with the revelation of Kimutai & Watanabe (2016) who observed that the CFAs within the Lembus forest in Nakuru County (Kenya) encountered unreliable source of finances and were forced to depend on donations from world forest organizations since the subscription fee was inadequate.

On statement F34 - You do not engage in forest patrol due to poor remuneration by the CFA, 47 (16.4 %) of the male respondents and 25 (8.9 %) of the female respondents 'Strongly Agreed', 41 (14.6 %) of the male respondents and 43 (15.4 %) of the female respondents 'Agreed', 22 (7.9 %) of the male respondents and 27 (9.6 %) of the female respondents were 'Neutral', 18 (6.4 %) of the male respondents and 24 (8.6 %) of the female respondents 'Disagreed' while 13 (4.6 %) of the male respondents and 21 (7.5 %) of the female respondents 'Strongly Disagreed'. According to Table 4.11, the mean score value for statement F34 for men was 3.64 which depict 'Agree' while mean score value for women was 3.19 which demonstrate 'Neutral'. These mean score indices affirm that men were more likely than women not to participate in forest patrol due to poor remuneration by the CFA.

However, it was established through interviews that men were likely to be discouraged compared to women by poor remuneration because most of the forest scouts were mainly men. Due to poor remuneration, some of the forest scouts may be tempted to receive bribes and allow illegal forest activities to go on unabated. This is supported by the argument of Rotich (2019) who advanced that corruption

contributed greatly to illegal forest activities such as logging of timber and posts as well as production of charcoal within Embobut forest (part of the Cherangany Hills Forest Ecosystem in Kenya). Through interviews, it was noted some of the forest scouts have been motivated by various Non-Governmental Organizations operating within the Cherangany Hills Forest as illustrated below.

(i) Nature Kenya (between 2013 and 2018) motivated the forest scouts by: paying them, providing them with uniforms and boots and training the forest scouts.

(ii) Vi-agroforestry (between 2012 and 2017) motivated the forest scouts by paying them Ksh 1500 per month and gave the forest scouts uniform and boots.

(iii) Sirya self-help group used the County Development Trust Fund to motivate the forest scouts by buying motor cycles that were to be used by the CFA leaders and forest scouts during forest patrols.

(iv) Cherangany Community Based Organization Consortium used the Global Environment Funds they received to motivate forest scouts and support livelihood activities.

On statement F35 - You do not engage in the exploitation of non-timber forest resources due to inadequate funds to pay for permits, 18 (6.4 %) of the male respondents and 22 (7.9 %) of the female respondents 'Strongly Agreed', 26 (9.3 %) of the male respondents while 38 (13.6 %) of the female respondents 'Agreed, 29 (10.4 %) of the male respondents and 35 (12.5 %) of the female respondents were 'Neutral, 31 (11.1 %) of the male respondents and 19 (6.8 %) of the female respondents 'Disagreed' while 36 (12.9 %) of the male respondents and 26 (9.3 %) of the female respondents 'Strongly Disagreed'. As indicated in Table 4.11, the mean score index of statement F35 for men was 2.71 which implies 'Neutral' and that of women was 3.08 which implies 'Neutral'. This finding emphasizes that both men and women were likely to be 'Unsure' to the opinion that they did not engage in exploitation of some non-timber forest resources due to inadequate funds was a constraint to the exploitation of forest resources. While accounting for these results,

it was noted through interviews that the permit fees for the collection or harvesting of the non-timber forest resources could be paid by both husbands and wives of the CFA members.

4.5.4 Distance constraints

Previous studies indicate that homestead–forest distance hamper the involvement of men and women in forest management and conservation (Ekanayake *et al.,* 2021**)**. Borrowing from this scholarly documentation, the extent to which distance limits the involvement of men and women in forest governance and exploitation of forest resources was established. The analyzed results were presented in Table 4.12.

Table 4.12: Level of agreement to the view that distance is a hindrance to involvement in forest governance and exploitation of forest resources

Statement	Gender	Level of Agreement					
		SD n (%)	D n (%)	N n (%)	A n (%)	SA n (%)	Mean score
F41. You do not attend some CFA meetings because they are held very far	M	18 (6.4)	23 (8.2)	31 (11.1)	46 (16.4)	22 (7.9)	3.22
	F	12 (4.3)	16 (5.7)	29 (10.4)	35 (12.5)	48 (17.1)	3.65
F42. You do not engage in forest patrol because the forest is located very far	M	24 (8.6)	28 (10.0)	26 (9.3)	39 (13.9)	23 (8.2)	3.06
	F	19 (6.8)	31 (11.1)	20 (7.1)	44 (15.7)	26 (9.3)	3.19
F43. You rarely report illegal forest cases because the forest station and forest guard post is very far	M	25 (8.9)	33 (11.8)	31 (11.1)	29 (10.4)	22 (7.9)	2.93
	F	21 (7.5)	37 (13.2)	23 (8.2)	39 (13.9)	20 (7.1)	3.00
F44. You rarely monitor the planted trees since the forest is very far	M	29 (10.4)	26 (9.3)	24 (8.6)	28 (10.0)	33 (11.8)	3.07
	F	25 (8.9)	22 (7.9)	36 (12.9)	31 (11.1)	26 (9.3)	3.08
F45. You rarely engage in the exploitation of forest resources since the forest is very far	M	32 (11.4)	36 (12.9)	33 (11.8)	27 (9.6)	12 (4.3)	2.65
	F	28 (10.0)	31 (11.1)	42 (15.0)	23 (8.2)	16 (5.7)	2.77

Source: Field survey (2021)

On statement F41 - You do not attend some CFA meetings because they are held very far, 22 (7.9 %) of the male respondents and 48 (17.1 %) of the female respondents ‘Strongly Agreed’, 46 (16.4 %) of the male respondents and 35 (12.5 %) of the female respondents ‘Agreed’, 31 (11.1 %) of the male respondents and 29 (10.4 %) of the female respondents were ‘Neutral’, 23 (8.2 %) of the male respondents and 16 (5.7 %) of the female respondents ‘Disagreed’ while 18 (6.4 %) of the male respondents and 12 (4.3 %) of the female respondents ‘Strongly Disagreed’. As shown in Table 4.12, the mean score of statement F41 for men was 3.22 which imply ‘Neutral’ while mean for women was 3.65 which reveal ‘Agree’.

The mean score difference suggests that women were more likely than men to agree to the view that they did not attend some of the forest meetings due long distance to the venue of these meetings. This revelation supports the documentation of Banana *et al* (2012) who revealed that long distance from home hindered the involvement of women in community forest management in Uganda. Moreover, it was pointed out through interviews that although some of the men received invitation messages to the forest related meetings they rarely attended the forest related meetings mainly because they were working far away from the village.

With regard to statement F42 - You do not engage in forest patrol because the forest is located very far, 23 (8.2 %) of the male respondents and 26 (9.3 %) of the female respondents ‘Strongly Agreed’, 39 (13.9 %) of the male respondents and 44 (15.7 %) of the female respondents ‘Agreed’, 26 (9.3 %) of the male respondents and 20 (7.1 %) of the female respondents were ‘Neutral’, 28 (10.0 %) of the male respondents and 31 (11.1 %) of the female respondents ‘Disagreed’ while 24 (8.6 %) of the male respondents and 19 (6.8 %) of the female respondents ‘Strongly Disagreed’. Table

4.12 illustrates that the mean score of statement F42 for women was 3.06 which imply ‘Neutral’ and mean score for men was 3.19 indicates ‘Neutral’. The mean score indices highlight that both men and women were ‘Unsure’ to the view that they were likely not to engage in forest patrol due to long distance from the forest.

While accounting for the gender variations, it was revealed during interviews that women’s mobility was restricted by the gender ascribed household tasks. It was further noted that some men and women residing between three and five kilometers away from the forest boundary were likely not to participate in forest patrol. This finding resembles the academic revelations of a study conducted by Okumu (2017) who observed that the households that were located far from the forests were likely to participate less in forest monitoring due to high opportunity costs. It was revealed through interviews that most of the men that engaged in forest patrol were residing within the radius of one kilometer from the forest. In most cases, these men composed of the indigenous community (Sengwer) because they were believed to have adequate knowledge about the tracks in the forest and had adapted to the terrain of the forested area.

On statement F43 - You rarely report illegal forest cases because the forest station and forest guard post are very far, 22 (7.9 %) of the male respondents and 20 (7.1 %) of the female respondents ‘Strongly Agreed’, 29 (10.4 %) of the male respondents and 39 (13.9 %) of the female respondents ‘Agreed’, 31 (11.1 %) of the male respondents and 23 (8.2 %) of the female respondents were ‘Neutral’, 33 (11.8 %) of the male respondents and 37 (13.2 %) of the female respondents ‘Disagreed’ while 25 (8.9 %) of the male respondents and 21 (7.5 %) of the female respondents ‘Strongly Disagreed’. It is clear from Table 4.12 that the mean score of statement F43 for women was 2.93 which indicates ‘Neutral’ while mean score for men was

3.00 which implies ‘Neutral’. This mean score value reiterates that both men and women were likely to be ‘Unsure’ to the view that they failed to report illegal forest cases due to long distance from their homesteads to the forest guard posts or stations.

It was noted during interviews that some of the male scouts residing near the forest guard posts (especially at Kipsambach village) were able to report illegal forest users to the forest guards. On the other hand, the male scouts living far away from the forest guard posts (like Kipsero village) failed to report the illegal forest users to the forest guards. To minimize the problem of distance to the forest guard posts, some of the forest scouts informed the CFA leaders who in turn communicated the illegal forest use to the forest guards. This indicates that there was evidence of vertical interactions between CFA members and CFA leaders in relation to reporting of illegal forest activities.

On statement F44 - You rarely monitor the planted trees since the forest is located very far, 33 (11.8 %) of the male respondents and 26 (9.3 %) of the female respondents ‘Strongly Agreed’, 28 (10.0 %) of the male respondents and 31 (11.1 %) of the female respondents ‘Agreed’, 24 (8.6 %) of the male respondents and 36 (12.9 %) of the female respondents were ‘Neutral’, 26 (9.3 %) of the male respondents and 22 (7.9 %) of the female respondents ‘Disagreed’ while 29 (10.4 %) of the male respondents and 25 (8.9 %) of the female respondents ‘Strongly Disagree’. As demonstrated in Table 4.12, the mean score value of statement F44 for men was 3.07 which depicts ‘Neutral’ while the mean score value for women was 3.08 which indicates ‘Neutral’. The mean score values emphasize that both men and women were ‘Unsure’ to the view that they did not engage in the monitoring of the planted trees within the forest due to long distance.

It was noted during interviews that a few of the men and women residing more than two kilometers away from the forest boundaries were more affected by the problem of distance than those residing less than two kilometres from the forest boundary. Therefore, they could not frequently monitor the trees planted in the forest under the PELIS programme. This observation concurs with the academic work of Banana *et al* (2012) who noted that women were hindered from engaging in community forest management by long distance from their homes to the forest in Uganda.

With regard to statement F45 - You rarely engage in the exploitation of forest resources since the forest is very far, 12 (4.3 %) of the male respondents and 16 (5.7 %) of the female respondents 'Strongly Agreed', 27 (9.6 %) of the male respondents while 23 (8.2 %) of the female respondents were 'Agreed', 33 (11.8 %) of the male respondents while 42 (15.0 %) of the female respondents were 'Neutral', 36 (12.9 %) of the male respondents and 31 (11.1 %) of the female respondents 'Disagreed', while 32 (11.4 %) of the male respondents and 28 (10.0 %) of the female 'Strongly Disagreed'. As presented in Table 4.12, the mean score value of statement F45 for men was 2.65 which indicates 'Neutral' and the mean score index for women was 2.77 which implies 'Neutral'. These mean score values underline that both men and women were 'Unsure' to the opinion that they did not engage in the exploitation of forest resources due to distance factors. During interviews, it was revealed that some of the CFA members faced the challenge of exploitation because these CFA members were residing more than two kilometres from the forest boundary.

4.5.5 Inadequate forest knowledge and training

A growing body of knowledge emphasize that some of the forest adjacent communities have limited forest knowledge and training about forest management

(Banana *et al*., 2012; Killian & Hyle, 2020; Uprety *et al.*, 2012). Therefore, using the ideas from the documented evidence, this sub-section aimed to establish how insufficient forest knowledge and training hinders the involvement of men and women in forest governance and exploitation of forest resources. To achieve this sub-objective, the respondents were asked to respond to the question: '*What is your level of agreement to the opinion that insufficient forest information and training is a constraint to your involvement in forest governance and exploitation of forest resources?* The responses were analyzed and presented as shown in Table 4.13 below:

On statement F51 - You rarely attend CFA meetings due to insufficient information about venue and time of meetings, 18 (6.4 %) of the male respondents and 23 (8.2 %) of the female respondents 'Strongly Agreed', 31 (11.1 %) of the male respondents and 35 (12.5 %) of the female respondents 'Agreed', 23 (8.2 %) of the male respondents and 26 (9.3 %) of the female respondents were 'Neutral', 32 (11.4 %) of the male respondents and 34 (12.1 %) of the female respondents 'Disagreed' while 36 (12.9 %) of the male respondents and 22 (7.9 %) of the female respondents 'Strongly Disagreed'. From Table 4.13, the mean score value of statement F51 for men was 2.74 which indicates 'Neutral' while mean score value for women was 3.02 which imply 'Neutral'. The mean scores suggest that both men and women unsure to the statement that they did not to attend forest meetings due to insufficient information about the venue and time of CFA meetings. The findings of the current study contradicts the academic work of Samndong & Kjosavik (2017) who argue that men had the advantage to access information about the time and venue of meetings but most of the women were unable to receive the information.

Table 4.13: Level of agreement to the view that inadequate forest information and training is a constraint to engagement in forest governance and exploitation of forest resources

Statement	Gender	Level of Agreement					
		SD n (%)	D n (%)	N n (%)	A n (%)	SA n (%)	Mean score
F51. You rarely attend CFA meetings due to insufficient information about the venue and time of meetings	M	36 (12.9)	32 (11.4)	23 (8.2)	31 (11.1)	18 (6.4)	2.74
	F	22 (7.9)	34 (12.1)	26 (9.3)	35 (12.5	23 (8.2)	3.02
F52. You rarely engage in articulation of forest laws and policies due to inadequate knowledge about forest policies and laws	M	32 (11.4)	39 (13.9)	33 (11.8)	19 (6.8)	17 (6.1)	2.64
	F	28 (10.0)	30 (10.7)	27 (9.6)	21 (7.5)	34 (12.1)	3.02
F53. You rarely participate in forest patrol due to inadequate training about forest scouting	M	23 (8.2)	26 (9.3)	29 (10.4)	37 (13.2)	25 (8.9)	3.11
	F	24 (8.6)	28 (10.0)	35 (12.5	33 (11.8)	20 (7.1)	2.98
F54. You rarely engage in planting trees due to inadequate information about the source of tree seedlings	M	26 (9.3)	45 (16.1)	32 (11.4)	19 (6.8)	18 (6.4)	2.70
	F	30 (10.7)	37 (13.2)	38 (13.6)	22 (7.9)	13 (4.6)	2.65
F55. You rarely engage in exploitation of forest resources due to inadequate information about the access rights	M	59 (21.1)	44 (15.7)	37 (13.2)	0 (0.0)	0 (0.0)	1.84
	F	56 (20.0)	53 (18.9)	31 (11.1)	0 (0.0)	0 (0.0)	1.82

Source: Field Survey (2021)

Through interviews, some of the men and women opined that they rarely attended CFA meetings because they did not receive the message about the venues and time due to lack of mobile phones. With regard to gender discrimination during sharing of forest information in Nepal, Uprety *et al* (2012) assert that women and other members of lower caste were not informed about the Community Forest User Group gatherings during which forest use rules were formulated. It was noted during interviews that in order to reduce the constraint of insufficient information about time and venue of CFA meetings, some of the men and women received information

from other CFA members who had obtained information. This reveals that horizontal interactions between CFA members enhanced the flow of forest information about the venue and time of CFA meetings.

In terms of statement F52 - You rarely engage in the articulation of forest laws and policies due to inadequate knowledge about forest policies and laws, 17 (6.1 %) of the male respondents and 34 (12.1 %) of the female respondents 'Strongly Agreed', 19 (6.8 %) of the male respondents and 21 (7.5 %) of the female respondents 'Agreed', 33 (11.8 %) of the male respondents and 27 (9.6 %) of the female respondents were 'Neutral', 39 (13.9 %) of the male respondents and 30 (10.7 %) of the female respondents 'Disagreed' while 32 (11.4 %) of the male respondents and 28 (10.0 %) of the female respondents 'Strongly Disagreed'. As illustrated in Table 4.13, the mean score value of statement F52 for men was 2.64 which demonstrate 'Neutral' while the mean score value for women was 3.02 which indicate 'Neutral'. The mean scores affirm that both men and women were likely to be 'Unsure' to the opinion that they not to participate in the articulation of forest laws and policies due to insufficient information about forest laws and policies. This revelation differs from the academic arguments of Baral (2014) and Killian & Hyle (2020) who pointed out that women unlike men had insufficient knowledge about the decisions on forest management and rules guiding the use of forest resources in Nepal and Tanzania.

However, through interviews it was reported that some men and women had information about the forest laws and policies due to the fact that there was adequate sensitization about forest laws and policies from the forest officers, public administrators, CFA leaders, friends, spouses, neighbours and media. This implies

horizontal and vertical interactions between and among forest actors enhanced the creation of awareness about forest laws and policies in the study area.

With regard to statement F53 - You rarely participate in forest patrol due to inadequate training about forest scouting, 25 (8.9 %) of the male respondents and 20 (7.1 %) of the female respondents 'Strongly Agreed', 37 (13.2 %) of the male respondents and 33 (11.8 %) of the female respondents 'Agreed', 29 (10.4 %) of the male respondents and 35 (12.5 %) of the female respondents were 'Neutral', 26 (9.3 %) of the male respondents and 28 (10.0 %) of the female respondents 'Disagreed' while 23 (8.2 %) of the male respondents and 24 (8.6 %) of the female respondents 'Strongly Disagreed'. As indicated in Table 4.13, the mean score value of statement F53 for men was 3.11 which imply 'Neutral' while mean score value for women was 2.98 which reveal 'Neutral'. The mean scores suggest that both men and women were 'Unsure' to the view that they did not engage in forest patrol since they had inadequate training about forest scouting.

This could be attributed to the argument that forest scouts had acquired forest information through intergenerational transfer of indigenous forest knowledge. This revelation concurs with the scholarly writing of some researchers who advance that indigenous ecological knowledge was transmitted from one generation to the next through stories, observations or actual performance of the forest activity in developing countries (Fortnam *et al*., 2019; Kiprop *et al*., 2017; Manginsela, 2016; Nabanoga, 2005). However, through interviews it was noted that apart from financially motivating the forest scouts, Vi-agroforestry (a non-government organization that was active in the area between 2013 and 2017) was active in the training of forest scouts to reduce role conflicts between the scouts and the forest guards.

On statement F54 - You rarely engage in planting trees due to inadequate information about source of tree seedlings, 18 (6.4 %) of the male respondents and 13 (4.6 %) of the female respondents 'Strongly Agreed', 19 (6.8 %) of the male respondents and 22 (7.9 %) of the female respondents 'Agreed', 32 (11.4 %) of the male respondents and 38 (13.6 %) of the female respondents were 'Neutral', 45 (16.1 %) of the male respondents and 37 (13.2 %) of the female respondents 'Disagreed' while 26 (9.3 %) of the male respondents and 30 (10.7 %) of the female respondents 'Strongly Disagreed'. It is clear from Table 4.13 that the mean score value of statement F54 for male respondents was 2.70 which indicate 'Neutral' while mean score value for female respondents was 2.65 which depict 'Neutral'. The mean scores confirm that both male and female spouses were 'unsure' to the opinion that they did not engage in the planting of trees within the forest due to inadequate information about the source of tree seedlings.

Through interviews, it was established that the problems of information about the source of tree seedlings was minimized through the initiatives of other key stakeholders as illustrated below by male key respondent 14:

(i) Public administrators (chiefs and Assistant Chief) mobilized public gathering of the CFA activities, they provided the venue for the CFA meetings, they liaised with other stakeholders like the County Government of Elgeyo Marakwet, Nyayo Tea Zones, and participated in public awareness on tree planting.

(ii) Kenya Tea Development Agency supported establishment of community tree nurseries, participated in planting the trees, maintained the trees, tree and disease control within the forest.

(iii) Member of County Assembly (Sengwer Ward) supported CFA members especially in establishment of tree nurseries, tree planting within the forests and liaised with the Chief's office to mobilize the people to attend tree planting activities.

(iv) Ministry of Environment and Natural Resources and Kenya Forest Service: donated the funds through the Kenya Forest Service which supported the CFA with tree seedlings, trained the CFA group members on establishment

of tree nurseries, provide financial support to the CFA and helped in controlling tree pests and diseases.

(v) County Government of Elgeyo Marakwet supported tree planting through the County Ministry of Environment that has a financial kitty.

(vi) Nature Kenya (between 2013 and 2018) supported both Kenya Forest Service and CFA to create awareness on forest conservation, organized educational tours to other parts of the country (Kabujoi Forest in Nandi County, Aberdare Forest in Nyandarua County, Mount Kenya Forest in Meru County, Mau Forest in Nakuru County and Kakamega Forest in Kakamega County), supported the CFA's mega indigenous tree nurseries with the Kapcherop Forest Station and exotic tree nurseries, transportation of tree seedlings, supported training in nursery establishment, management and pests and disease control.

(vii) Vi-agroforestry (between 2012 and 2017) supported establishment of tree nurseries.

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Some of the organizations and departments of national government that have supported community participation in forest management in the study area have also supported other forest dependent communities in Uganda. For instance, Banana *et al* (2012) confirm that Vi-agroforestry provided tree seeds and seedlings, as well as supported seed collection, tree nursery establishment and tree planting in Uganda while Nature Uganda played a key role in not only tree planting but also in promoting livelihood projects like pig farming and poultry rearing.

In relation to statement F55 - You rarely engage in exploitation of forest resources due to inadequate information about the access rights, none (0.0 %) of the male respondents nor female respondents 'Strongly Agreed' or 'Agreed', 37 (13.2 %) of the male respondents while 31 (11.1 %) of the female respondents were 'Neutral', 44 (15.7 %) of the male respondents and 53 (18.9 %) of the female respondents 'Disagreed', while 59 (21.1 %) of the male respondents and 56 (20.0 %) of the female respondents 'Strongly Disagreed'. As presented in Table 4.13, the mean score index of statement F55 for men was 1.84 which implies 'Disagree' and the mean

score value for women was 1.82 which indicates 'Disagree'. This mean scores indicate that both men and women disagreed to the statement that they rarely engaged in exploitation of forest resources due to inadequate information about the access rights. Through interviews, it was established that during the CFA meetings both the male and female CFA members were informed of their rights to forest resources as well as the royalty / permit fees by the CFA leaders and KFS officers.

4.5.6 Gender norms of behaviour

Colfer & Minarchek (2013) theorized in their 'Gender Box' theoretical framework that gender norm of behaviour influences women's interactions with the men not only within the community but also within forest user groups. Borrowing from this concept, the respondents were asked to state their level of agreement to the statement that: *gender norms of behaviour are a hindrance to the involvement of women in forest governance and exploitation of forest resources?* The results were analyzed and presented in Table 4.14 below.

With regard to statement F61 – Women do not attend forest meetings because the culture dictates that they must attend with their husbands, none (0.0 %) of the male respondents nor female respondents 'Strongly Agreed', none (0.0 %) of the male respondents and 3 (1.1 %) of the female respondents 'Agreed', 34 (12.1 %) of the male respondents and 35 (12.5 %) of the female respondents were 'Neutral', 59 (21.1 %) of the male respondents and 54 (19.3 %) of the female respondents 'Disagreed' while 47 (16.8 %) of the male respondents and 48 (17.1 %) of the female respondents 'Strongly Disagreed'. Table 4.14 reveal that the mean score value of statement F61 for men was 1.91 which implies 'Disagree' while mean score value for women was 1.95 which indicates 'Disagree'. The mean score values emphasize

that both men and women opposed the view that '*women did not attend forest meetings because they were not permitted to attend in the absence of their husbands*'.

Table 4.14: Level of agreement to the view that gender norms of behaviour is a hindrance to the involvement of women in forest governance

Statement	Gender	Level of Agreement					
		SD n (%)	D n (%)	N n (%)	A n (%)	SA n (%)	Mean score
F61. Women do not attend forest meetings because the culture dictates that they must attend with their husbands	M	47 (16.8)	59 (21.1)	34 (12.1)	0 (0.0)	0 (0.0)	1.91
	F	48 (17.1)	54 (19.3)	35 (12.5)	3 (1.1)	0 (0.0)	1.95
F62. Women do not speak during forest meetings because they are not given permission to speak	M	63 (22.5)	39 (13.9)	33 (11.8)	5 (1.8)	0 (0.0)	1.86
	F	54 (19.3)	42 (15.0)	26 (9.3)	18 (6.4)	0 (0.0)	2.06
F63. Women do not seek leadership positions in the CFA because they are inferior to men	M	0 (0.0)	18 (6.4)	29 (10.4)	37 (13.2)	56 (20.0)	3.94
	F	34 (12.1)	31 (11.1)	27 (9.6)	22 (7.9)	26 (9.3)	2.82
F64. Women do not engage in tree planting within the forest because it is against the traditions	M	12 (4.3)	34 (12.1)	25 (8.9)	31 (11.1)	38 (13.6)	3.35
	F	0 (0.0)	18 (6.4)	30 (10.7)	49 (17.5)	43 (15.4)	3.84
F65. Women do not participate in forest patrol because they are believed to be weak and fearful	M	5 (1.8)	27 (9.6)	23 (8.2)	41 (14.6)	44 (15.7)	3.66
	F	0 (0.0)	0 (0.0)	35 (12.5)	48 (17.1)	57 (20.4)	4.16
F66. Women do not engage in the exploitation of some non-timber forest resources because it is against the cultural beliefs	M	28 (10.0)	31 (11.1)	39 (13.9)	25 (8.9)	17 (6.1)	2.80
	F	13 (4.6)	15 (5.4)	36 (12.9)	42 (15.0)	34 (12.1)	3.49

Source: Field Survey (2021)

It was established through interviews that both men and women were given equal opportunities to attend the forest related meetings mainly gender affirmative action,

modernization, and formal education that have reduced the implications of restrictive culturally defined gender norms.

On statement F62 - Women do not speak during forest meetings because they are not given permission to speak, none (0.0 %) of the male respondents nor female respondents 'Strongly Agreed', 5 (1.8 %) of the male respondents and 18 (6.4 %) of the female respondents 'Agreed', 33 (11.8 %) of the male respondents and 26 (9.3 %) of the female respondents were 'Neutral', 39 (13.9 %) of the male respondents and 42 (15.0 %) of the female respondents 'Disagreed' while 63 (22.5 %) of the male respondents and 54 (19.3 %) of the female respondents 'Strongly Disagree'. As demonstrated in Table 4.14, the mean score value of statement F62 for men was 1.86 which depicts 'Disagree' while the mean score value for women was 2.06 which indicates 'Disagree'. The mean score difference underscores that both men and women disagreed with the view that '*women did not speak during forest meetings because they were not given permission to speak*'. Owing to the discriminatory gender norms of behaviour, some of the women who attended forest related meetings in Africa and Asia did not speak or engage in decision making due to low self-confidence and fear of male members in Asia and Africa (Agarwal, 2001; Baral, 2014; Killian & Hyle, 2020; Mashapa *et al*., 2020).

On statement F63 – Women do not seek leadership positions in the CFA because they are inferior to men, 56 (20.0 %) of the male respondents and 26 (9.3 %) of the female respondents 'Strongly Agreed', 37 (13.2 %) of the male respondents and 22 (7.9 %) of the female respondents 'Agreed', 29 (10.4 %) of the male respondents and 27 (9.6 %) of the female respondents were 'Neutral', 18 (6.4 %) of the male respondents and 31 (11.1 %) of the female respondents 'Disagreed' while none (0.0

%) of the male respondents and 34 (12.1 %) of the female respondents 'Strongly Disagreed'. As indicated in Table 4.14, the mean score value of statement F63 for men was 3.94 which imply 'Agree' and the mean score value for women was 2.82 which depict 'Neutral'. The mean score values suggest that the husbands were more likely than wives were 'Agreed' with the assertion that '*women did not seek leadership positions in the forest organizations because women were believed to be subordinate to men*'. Egunyu & Reed (2015) and Samndong & Kjosavik (2017) corroborate that the fear of men by women influenced the spaces and opportunities available for women to occupy executive positions and engage in decision making within community based forest organizations in the DRC and Uganda.

On statement F64 – Women do not engage in tree planting within the forest because it is against the traditions, 38 (13.6 %) of the male respondents and 43 (15.4 %) of the female respondents 'Strongly Agreed', 31 (11.1 %) of the male respondents and 49 (17.5 %) of the female respondents 'Agreed', 25 (8.9 %) of the male respondents and 30 (10.7 %) of the female respondents were 'Neutral', 34 (12.1 %) of the male respondents and 18 (6.4 %) of the female respondents 'Disagreed' while 12 (4.3 %) of the male respondents and none (0.0 %) of the female respondents 'Strongly Disagreed'. From Table 4.14, the mean score value of statement F64 for men was 3.35 which indicate 'Agree' while the mean score value for women was 3.84 which imply 'Agree'. This result underlines that both husbands and wives were likely to concur with the opinion that the female spouses did not engage in tree planting within the forest because it was against their culture. Through interviews, it was established that tree planting is man's job and the exploitation of the tree products are also male dominated. But, due to some affirmative action some women noted that they engaged in the planting of trees within the PELIS plots in the forest. This

finding is in line with the scholarly work of other researchers who demonstrated that both men and women engaged in not only tree planting but also in silvicultural activities in Africa (Bourne *et al.,* 2015; Egunyu & Reed, 2015; Elias, 2015; Gautier & van Santen, 2014; Kalanzi *et al.,* 2020; Nkengla, 2014; Rukundo, 2018)**.**

On statement F65 - Women do not participate in forest patrol because they are believed to be weak and fearful, 44 (15.7 %) of the male respondents and 57 (20.4 %) of the female respondents 'Strongly Agreed', 41 (14.6 %) of the male respondents and 48 (17.1 %) of the female respondents 'Agreed', 23 (8.2 %) of the male respondents and 35 (12.5 %) of the female respondents were 'Neutral', 27 (9.6 %) of the male respondents and none (0.0 %) of the female respondents 'Disagreed' while 5 (1.8 %) of the male respondents and none (0.0 %) of the female respondents 'Strongly Disagreed'. As presented in Table 4.14, the mean score value of statement F65 for men was 3.66 which means 'Agree' while the mean score value for women was 4.16 which indicates 'Agree'. This revelation indicates that both men and women were likely to agree with the opinion that '*women did not participate in forest patrol because women were considered to be weak and fearful*'. While explaining why women failed to participate in forest patrol in Africa, some scholars reiterated that women were likely to encounter resistance during apprehension of forest offenders while some women regarded forest patrol as a 'men's activity' because of the 'fear of danger' in the forest (Banana *et al*., 2012; Bitange *et al.,* 2021; Mashapa *et al*., 2020).

With regard to statement F66 - Women do not engage in the exploitation of some non-timber forest resources because it is against the cultural beliefs, 17 (6.1 %) of the male respondents and 34 (12.1 %) of the female respondents 'Strongly Agreed',

25 (8.9 %) of the male respondents while 42 (15.0 %) of the female respondents 'Agreed, 39 (13.9 %) of the male respondents and 36 (12.9 %) of the female respondents were 'Neutral, 31 (11.1 %) of the male respondents and 15 (5.4 %) of the female respondents 'Disagreed' while 28 (10.0 %) of the male respondents and 13 (4.6 %) of the female respondents 'Strongly Disagreed'. From Table 4.14, the mean score value of statement F66 for men was 2.80 which indicates 'Neutral' and the mean score index for women was 3.49 which reveals 'Agree'. This finding reiterates that women were more likely than men to agree with the view that women did not engage in the exploitation of some of the forest resources because it was against the cultural beliefs. Through interviews, it was reported that some women were hesitant to engage in the bee-keeping due to socio-cultural beliefs while some men were not engaging in collection of vegetables due to gender norms of behaviour.

4.5.7 Summary of the section

This section indicates that husbands of the CFA members were likely to discourage their wives from attending forest meetings, seeking leadership roles as well as rebuke their wives from speaking during meetings. On the other hand, the wives were likely to discourage their male spouses from participating in forest patrol. Both men and women were likely not to attend forest related meetings, seek leadership positions in the CFA and engage in forest patrols due to time constraints. Financial constraints were not a major hindrance for the engagement of husbands and wives in forest governance. Distance was a limiting factor for husbands and wives during attendance of meetings, forest patrols and reporting of illegal forest cases. Gender norms of behaviour was a constraint for wives during seeking for leadership posts, planting of trees within the forest, forest patrols, and exploitation of some forest resources.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This section of the study focuses on the summary of the findings, the conclusions of the study and recommendations of the study.

5.2 Summary of Study Findings

5.2.1 Nature and extent of involvement of men and women in Community Forest Association Activities

In this study, it was confirmed that husbands had been CFA members for a longer duration compared to the wives. In a majority of the CFA members' households, there was collaborative gender relation between husbands and wives as they shared the role of paying the CFA subscription fees. It was demonstrated that husbands of CFA members always attended CFA meetings as compared to wives of CFA members. Most of the husbands and wives of CFA members mainly attended CFA meetings held within one of the CFA member's compound and primary schools especially in the afternoon. In addition, both husbands and wives were frequently consulted by the CFA leaders over the establishment of tree nurseries. Moreover, It was confirmed that there was collaborative intra-household gender relations during planting of tree seedlings and weeding of planted trees since both husbands and wives engaged substantially in the planting of tree seedlings and weeding of planted trees within the forest. But, there was unbalanced intra-household gender relation because the husbands of CFA members dominated the establishment and maintenance of tree nurseries at the forest station as well as pruning of trees within the forest.

It was emphasized that there existed collaborative gendered relations during engagement in articulation of forest rules since both husbands and wives engaged in the articulation of forest use rules to same extent, but unbalanced intra-household gender relations since the husbands dominated the formulation of CFA by-laws and forest use rules and forest patrol. It was advanced that the husbands of CFA members were more likely than wives of CFA members to make the decision to continue with payment of CFA fees, attending CFA meetings, engaging in reforestation activities, and engaging in forest patrols.

5.2.2 Intra-household gendered decision making powers and roles in the use of forest resources

The results demonstrate that there was substantial collaborative intra-household gender relation since the husbands and wives shared decision making powers over crop farming, collection of livestock pasture from the forest, and grazing of livestock within the forest. Moreover, it was revealed that there was substantial collaborative gender relation evidenced by sharing of roles over the cultivation of crops within the forest. But, it was confirmed that there existed unbalanced gender relations during use of forest resources since men dominated the collection of livestock fodder, grazing of livestock, hanging of bee-hives and harvesting of honey while women engaged more than men in collection of firewood and indigenous vegetables from the forest.

Moreover, unequal intra-household gender relations were common during sale of forest resources due to the fact that women dominated the decision making over the sale of crop products, firewood, indigenous vegetables, wild fruits, and herbal medicine while men dominated the decision over the sale of honey. With regard to continuity to use forest resources, it was observed that men were more likely than

women to continue with grazing of livestock and bee-keeping while women were more likely than men to continue with cultivation of crops, collection of firewood, collection of herbal plants, collection of indigenous vegetables, and picking of wild fruits within the forest.

5.2.3 Implication of gender involvement in Community Forest Association activities and use of forest resources on livelihoods

The results demonstrated that involvement of both the husbands and wives in reforestation and forest patrol had minimal implication on access to income. It was confirmed that the engagement of both the husbands and wives in cultivation of crops and pasture collection from the forest had led to sufficient access to food and livestock feeds respectively. The findings advanced that the sharing of decision making powers and roles between husbands and wives during the collection of vegetables and collection of firewood from the forest had led to sufficient access to vegetables and wood fuel respectively. It was revealed that men were more likely than women to hold the view that sharing of decision making powers and roles between husbands and women in the preparation of herbal medicine had led to sufficient access to medicine.

Men got the highest share of income from forest governance activities and sale of honey while women received the largest proportion of the income secured from the sale of firewood, wild fruits, indigenous vegetables and herbal medicine. But, the husbands and wives shared the money from the sale of crop products equally. The men used the money to pay farm workers as well as to cater for transport costs while the women used the money to purchase household items and pay for social group contributions.

5.2.4 Constraints and opportunities available for men and women engaging in Community Forest Association activities and use of forest resources

The results showed that wives of CFA members were more likely than husbands to be discouraged from attending CFA meeting, speaking during CFA meetings, and seeking leadership roles within the CFA by their spouses. Some of the wives of CFA members used intra-household bargaining strategies, employed domestic workers, and shared their concerns with the female CFA leaders to solve the problem of discouragement from spouses. Both husbands and wives of CFA members were likely not to attend forest related meetings and seek leadership positions due to time constraints but men were more likely than women not to engage in forest patrols due to time limitations. This problem was minimized through seeking assistance from their children and relatives.

The findings emphasized that men were more likely than women not to participate in forest patrol due to poor remuneration by the CFA. But, inadequate funds had minimal implication on the failure of male and female CFA members to engage in the payment of membership subscription fees, maintenance of tree nurseries, and exploitation of forest resources. Some of the women requested their husbands and siblings to pay the CFA membership fee for them, other CFA members demanded for the financial records to be tabled as well as advocated for the removal of all the CFA leaders who embezzled the CFA finances.

The results reiterated that women were more likely than men not to attend the CFA meetings due to long distance to the venue of these meetings. But, distance had minimal effect on the involvement of men and women in forest patrol, reporting of illegal forest activities as well as monitoring of the planted trees within the forest.

Some of the forest scouts informed the CFA leaders who in turn communicated the illegal forest use to the forest guards.

The findings indicate that very few husbands and wives of CFA members were not hindered from participating in forest governance and exploitation of forest resources by insufficient information about the venue and time of meetings, inadequate knowledge about forest policies and laws, inadequate training about forest scouting, inadequate information about the source of tree seedlings, and inadequate information about the access rights. Some of the husbands and wives received information from other CFA members, forest officers, public administrators, CFA leaders, friends, spouses, neighbours and media.

The findings suggest that husbands were more likely than wives to support the belief that women did not seek leadership positions because women are inferior to men. Both husbands and wives believed that women did not engage in tree planting within the forest because it was against their culture and participate in forest patrol because women were considered weak and fearful as well as men and women did not engage in exploitation of some forest resources because it was against the culture. Husbands were more likely than wives to agree with the view that women did not speak during forest meetings because women are supposed to only listen to men during public meetings. However, both husbands and wives were given equal opportunities to attend the forest related meetings mainly due to the effects of gender affirmative action, modernization, and formal education that have reduced the implication of restrictive culturally defined gender norms.

5.3 Conclusion

5.3.1 Conclusion of Study Findings

Drawing upon the arguments of 'Typology of Participation model' as argued by Agarwal (2001, 2010), the findings confirm that both men and women engaged in forest governance at the six levels. At nominal level, husbands and wives shared the role of paying the CFA subscription fees and at 'passive level' they attended CFA meetings. At 'consultative level', CFA leaders consulted both men and women minimally over the CFA financial matters. At 'activity-specific level', both men and men engaged substantially in the planting of tree seedlings and weeding of planted trees within the forest. During 'active level of participation', both male and female CFA members participated in the articulation of forest use rules. At the 'interactive level' of participation in forest governance, husbands dominated the decision to continue with payment of CFA fees, attendance of CFA meetings, engaging in reforestation activities, and engaging in forest patrols. However, the model does not explain the factors that influenced the gendered variations in decision making to continue with engagement of men and women at the six levels of participation.

Building on the Theory of Feminist Political Ecology as theorized by Rocheleau, Thomas-Slayter and Wangari (1996), there was unequal gendered relation over the collection of firewood, indigenous vegetables, herbal plants, wild fruits as well as bee-keeping within the forest. While supporting the arguments of the feminist political ecologists, women dominated the decisions over the sale of crop products, vegetables, fruits and herbal medicine while men dominated the decision making over the sale of honey. However, the theory of Feminist Political Ecology failed to account for the factors influencing the continuity of men and women involvement in exploitation of forest resources.

Based on the existing livelihood studies, collaborative gender relations during reforestation and forest patrol contributed minimally to access to natural capital and financial capital. Also, collaborative gender relations during cultivation of crops and pasture collection contributed to household's access to food and livestock feeds and human capital (herbal medicine). In addition, the financial capital obtained from the forest governance activities and sale of forest resources was used for transport, purchase of household items, payment of household workers, and payment of contributions for religious and social groups.

While confirming the 'Gender Box' theoretical framework as proposed by Colfer & Minarchek (2013), unequal intra-household gender relation at micro-scale level hindered women from effectively attending CFA meetings, speaking during CFA meetings and seeking of leadership roles within the CFA. But, bargaining strategies as emphasized in the theoretical framework of 'Gender Box' were adopted to reduce the impacts. As advanced in the theoretical framework of 'Gender Box', time factor operating at micro-scale level hindered both men and women from attending CFA meetings and seeking CFA leadership positions as well as hindered more men than women from engaging in forest patrols.

The study emphasizes that argument of 'Gender Box' theoretical framework by revealing that poor remuneration by the CFA discouraged men more than women from participating in forest patrol. As argued in the 'Gender box' theoretical framework, this study points out that distance from the venue of CFA meetings hindered the engagement of women more than men from attending CFA meetings. This finding contradicts the premise of the 'Gender Box' framework that at meso scale level since insufficient information about the: venue and time of CFA meetings, the source of tree seedlings and forest laws and policies as well as

inadequate training on forest scouting has minimal implications on the engagement of both men and women in forest governance and use of forest resources. As advanced in the 'Gender Box' framework, women did not seek leadership positions in the forest organizations and engaged in forest patrols because they were subordinate to men and were regarded the weaker gender. Moreover, women did not engage in tree planting and exploitation of some forest resources because it was against the tradition customs. This is in support of the ideas of 'Hegemonic Masculinity' as advanced in the 'Gender Box' theoretical framework where '*women were believed to be subordinate to men and considered to be weak and fearful*'. However, the 'Gender Box' theoretical framework failed to account for the opportunities available for both men and women to surmount the challenges of time, finances, distance, and gender norm of behaviour.

5.3.2 Contributions to New Knowledge

1. Since limited studies exist on the intra-household gendered involvement in forest governance in developing nations, the findings of the current study has contributed to the growing body of knowledge on gender dimensions in Participatory Forest Management. Specifically, through the revelation that husbands and wives engaged in CFA activities at same extent during planting of tree seedlings and weeding of tree seedlings within the forest as well as during the articulation of forest use rules within the community.
2. Building on the premise that a few studies have been conducted on the continuity of men and women in forest governance, this study contributes to the knowledge on inter-generational gendered participation in forest governance and use of forest resources. The findings of this study indicates that the male spouses were more likely than the female spouses to continue

engaging in CFA activities while women were likely to continue with involvement in exploitation of non-timber forest resources. Moreover, the motivating factors for both the husbands and wives to continue engaging in CFA activities was established to be: affordability of the CFA fees, the need get more information about CFA activities, the financial gain, training received and remuneration, adequate knowledge about the roles of the CFA members and significance of the information to others.

3. Guided by the view that forests are one of the major sources of livelihoods for forest adjacent communities, this study contributes to the growing body of knowledge that use of forest resources is gendered. The present study confirms that the involvement of both male and female spouses in forest governance and use of forest resources contributed to acces to livelihood assets such as food, livestock pasture, firewood, and herbal medicine. Further, the motivating factors for the husbands and wives of CFA members to continue using forest resources was unravelled such as to access food for household, obtain income, scarcity of pasture within the homestead during dry season, firewood collected from forest was dry and therefore ready for use, use the herbal medicine to treat a myriad of ailments as well as to save the expenses on vegetables.
4. Grounded on the argument that little information exist on challenges and opportunities for male and female spouses engaging in forest governance and use of forest resources, the results of this study contributes to knowledge about the constraints and opportunities for forest dependent communities. Specifically, this study result advances that husbands and wives were both hindered by time constraints from engaging in forest governance and gender norms of behaviour from exploitation of some forest resources.

5.4 Recommendations

5.4.1 Recommendations for Policy

Based on the results and discussions of this study, the following recommendations are proposed to promote gender equity in forest governance and use of forest resources:

First, in order to promote gender equity at the household level, this study suggests that husbands and wives of CFA members should share not only roles with regard to payment of CFA fees, reforestation activities, forest patrols, and exploitation of forest resources but also benefits accrued from the sale of forest products to enhance collaborative household gender relations. This could be done through creating awareness during the CFA meetings and other fora.

Second, this study proposes that both male and female CFA members should encourage their spouses to join CFAs, attend CFA meetings, speak during CFA meetings, take up leadership roles in the CFA and engage in reforestation and forest patrols so that the pool of members engaging in forest governance is increased. This could be done through sharing of not only information about CFA activities but also benefits associated with involvement in CFA activities at household level.

Third, drawing upon the finding that CFA leaders play critical role in forest governance, this research suggests that the CFA leaders should ensure transparency and accountability in the management of the CFA resources as well as gender equity in the allocation of forest management duties. This could be done by following the forest governance guidelines that advocates for gender mainstreaming, fairness and transparency within the CFAs.

Fourth, building on the recognition that information is important in the forest governance, this study recommends that the CFA leaders and KFS should integrate the information and communication technologies such as mobile phones and computers in disseminating of forest information about new policies as well as venue and time of meetings to the CFA members to enhance gender equity in access to information about forest laws and policies.

Fifth, owing to the fact that financial constraints hindered the involvement of men and women in forest governance and exploitation of forest resources, this research proposes that the Kenya Forest Service should review the existing policies on revenue sharing with the CFA and remit the agreeable amount of money to the CFAs according to the PFM agreements as proposed in the PFM guidelines of 2015. This can be done through decentralization of the distribution of financial resources to the forest station level where the money is remitted annually to the CFAs by the forest station managers.

Sixth, this study recommends that the Kenya Forest Service should include the CFA committees in making decisions with regard to protection, management, conservation and use of forest resources as indicated in the Forest Act of 2016. The Kenya Forest Service should advocate for democratic elections during selection of CFA leaders by playing the role of returning officers.

Seventh, guided by the finding that the Non-Governmental organizations are imperative in the promotion of forest governance, this study proposes that the forest based non-governmental organizations should increase the financial support, capacity building and awareness creation among the CFA members to ensure effective participation of both men and women in forest governance.

Eight, this study recommends that Non-governmental Organizations such as Nature Kenya and Vi-agroforestry should continue supporting the CFA members in the study area by offering training and remuneration to forest scouts as well as support livelihood activities such as tree nursery establishment and cattle rearing.

5.4.2 Recommendations for Future Studies

As pointed out within the significance of the study section, the findings of this study are very important to future researchers. This study has unravelled some of the previously unexamined research questions on the intra-household gender relations in the protection, management, conservation and use of forest resources in Cherangany Hills. Nevertheless, there are some of the issues that remained unaddressed which should be examined by future researchers.

(i) A study should be conducted using Geographic Information System and Remote Sensing techniques to determine the implication of the gendered involvement in CFA activities on forest cover.

(ii) Future researchers should consider using the Theory of Interactive Governance and Sustainable Livelihood Approach to assess the extent to which men and women engage in CFA activities to promote livelihoods.

(iii) Since this study mainly focused on exploitation of non-timber forest products, future studies should examine the gendered involvement in the exploitation of timber forest products within state-owned forests and its implications on livelihoods.

(iv) Future studies should be based on the principles and ideas of positivist research paradigm, quantitative research approach and explanatory research design to assess the gendered inter-household relations in forest governance and its implications on livelihoods.

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APPENDICES

Appendix 1: Household Questionnaire

PREAMBLE

I am a post graduate student at Moi University Main Campus undertaking a Doctor of Philosophy degree in Geography. I am conducting a study on '***Gender Relations in Forest Governance and Use of Forest Resources within Cherangany Hills Forest, Kenya'***. This study is conducted purely for academic reasons and is solely intended to obtain your views and perceptions about power relations between men and women involved in forest management, use of and conservation of forest resources. Hence, it is not meant to devalue or intimidate you in any way or whatsoever. Your identity will remain anonymous unless by your permission and that your response will be treated with uttermost confidentiality. In view of this therefore, I humbly request you to provide information to the best of your knowledge and understanding.

Thank you.

A: RESPONDENT'S IDENTIFICATION

A1: Sub-location_____ A2: Village:_____

A3. Forest User Group (s): _____

B: DEMOGRAPHICS

B1. How old are you? _____(Years)

B2. How many members are there in your household? _____

B3. What is your ethnic background?_____

B4. What is your highest level of education?_____

B5. What is your main source of livelihood/ Occupation?_____

B6. How much income do you earned per month? _____(KShs)

B7: How far is your homestead from the forest boundary? _____ (Kms)

C: INVOLVEMENT OF MEN AND WOMEN IN COMMUNITY FOREST ASSOCIATION ACTIVITIES

C1. How long have you been a member of the CFA? _____(Years)

C2. Who within your household usually pays the CFA subscription fees?

_____

C3. How often do you attend the CFA meetings? Kindly tick (√) where applicable.

1 = Always ☐ 2 = Sometimes ☐ 3 = Rarely ☐ 4 = Never ☐

C4. Where do you usually attend the CFA meetings? _____

_____

C5. At what time and day do you usually attend Community Forest Association meetings?

_____

C6. How frequent are you consulted by the CFA leaders about the following forest governance activities? The frequency of consultation was assessed on Likert scale of 1-4 where: 1 = Never (N), 2 = Rarely (R), 3 = Sometimes (S), and 4 = Always (A). Kindly tick (√) where applicable.

Statements	**Frequency of Consultation**			
	N	**R**	**S**	A
C61. Consulted over scheduling of CFA meetings				
C62. Consulted over planning for forest patrol				
C63. Consulted over establishment of tree nurseries				
C64. Consulted over financial matters of CFA				
C65. Consulted over indigenous forest knowledge				

C7. To what extent do you engage in the following reforestation activities? The extent of involvement was assessed on Likert scale of 1-4 where: 1 = Not at all (NA), 2 = Less Extent (LE), 3 = Some Extent (SE) and 4 = Great Extent (GE). Kindly tick (√) where applicable.

Statements	**Extent of engagement**			
	NA	**LE**	**SE**	**GE**
C71. Establishment and maintenance of tree nurseries at the forest station				
C72. Planting of tree seedlings				
C73. Weeding of planted trees				
C74. Pruning and thinning of planted trees				

C8. To what extent do you engage in the following forest protection activities? The extent of engagement was assessed on Likert scale of 1-4 where: 1 = Not at all (NA), 2 = Less Extent (LE), 3 = Some Extent (SE) and 4 = Great Extent (GE). Kindly tick (√) where applicable.

Statements	Extent of involvement			
	NA	LE	SE	GE
C81. Formulation of CFA by-laws and forest rules				
C82. Articulation of forest use rules				
C83. Forest patrols				

C9. Do you intend to continue engaging in the following forest governance activities? Kindly tick (√) where applicable.

Statements	Yes	No
C91. To continue paying CFA fees		
C92. To continue attending CFA meetings		
C93. To continue engaging in reforestation activities		
C94. To continue engaging in forest protection activities		
C95. To continue with articulation of forest use rules		

D. INTRAHOUSEHOLD GENDERED DECISION MAKING POWERS AND ROLES OVER THE USE OF FOREST RESOURCES

D1. To what extent do you and your spouse jointly engage in decision making over the exploitation and use of the following forest resources? The extent of involvement was assessed on Likert scale of 1-4 where: 1 = Not at all (NA), 2 = Less Extent (LE), 3 = Some Extent (SE) and 4 = Great Extent (GE). Kindly tick (√) where applicable.

Statement	Extent of involvement			
	NA	LE	SE	GE
D11. Cultivation of food crops				
D12. Animal fodder and grazing of livestock				
D13. Fire wood				
D14. Herbal plants				
D15 Honey				
D16 Indigenous vegetables				
D17 Wild fruits				

D2. To what extent do you and your spouse share the responsibilities and rights over the use of the following forest resources? The extent of involvement was assessed on Likert scale of 1-4 where: 1 = Not at all (NA), 2 = Less Extent (LE), 3 = Some Extent (SE) and 4 = Great Extent (GE). Kindly tick (√) where applicable.

Statement	**Extent of involvement**			
	NA	**LE**	**SE**	**GE**
D21. Cultivation of crops in the forest				
D22. Pasture collection and grazing of livestock				
D23. Collection of firewood				
D24. Collection of herbs				
D25. Hanging bee hives and harvesting honey				
D26 Collection of indigenous vegetables				
D27 Collection of wild fruits				

D3. Who makes the decision over the sale of the following forest products? Kindly tick (√) where applicable.

Statement	**Who make the decision**			
	Do not sell	Wife	Husband	Both husband and wife
D31. Crop products				
D32. Fire wood				
D33. Wild vegetables & fruits				
D34. Herbal medicine				
D35. Honey				
D36. Others (specify)				

D4. Do you intend to continue using the following forest resources? Kindly tick (√) where applicable.

Statements	**Yes**	**No**
D41. Cultivation of crops in the forest		
D42. Pasture collection and grazing of livestock		
D43. Collection of firewood		
D44. Collection of herbal plants		
D45. Hanging bee hives and harvesting honey		
D46 Collection of indigenous vegetables		
D47 Collection of wild fruits		
D48 Other (specify)		

E: IMPLICATION OF INVOLVEMENT MEN AND WOMEN IN COMMUNITY FOREST ASSOCIATION ACTIVITIES AND USE OF FOREST RESOURCES ON LIVELIHOODS

E1: What is your level of agreement to the statement that the involvement of husbands and wives in Community Forest Association activities and use of forest resources has an implication on livelihoods? Kindly tick (√) where applicable.

Statement	Level of Agreement				
	SD	D	N	A	SA
E11. Involvement of both husbands and wives in reforestation and forest patrol has led to sufficient access to income.					
E12. Involvement of both husbands and wives in crop cultivation in the forest has led to sufficient access to food.					
E13. Involvement of both husbands and wives in the collection of pasture and grazing of animals in the forest has led to sufficient access to livestock feeds					
E14. Involvement of both husbands and wives in the collection of vegetables and fruits has led to sufficient access to food					
E15. Involvement of both husbands and wives in the collection of firewood from the forest has led to sufficient access to wood fuel					
E16. Involvement of both husbands and wives in the preparation of herbal medicine has led to sufficient access to herbal medicine					

E2. How do you share the income obtained from the forest governance and sale of forest products with your spouse. Kindly tick (√) where applicable.

Statement	**How money from forest governance and sale of forest resources is shared**			
	Do not get any income	Wife get more	Husband gets more	Husband and wife share equally
E21. PFM/CFA activities				
E21. Crop products				
E22. Fire wood				
E23. Wild vegetables & fruits				
E24. Herbal medicine				
E25. Honey				

F. CONSTRAINTS TO INVOLVEMENT OF MEN AND WOMEN IN COMMUNITY FOREST ASSOCIATION ACTIVITIES AND USE OF FOREST RESOURCES

F1. What is your level of agreement to the statement that intra-household gender relations hindered your involvement in the various Community Forest Association activities and use of forest resources? Kindly tick (√) where applicable.

Statement	Level of Agreement				
	SD	D	N	A	SA
F11. You do not attend forest meetings because your spouse has discouraged you					
F12. You do not speak during forest meetings because your spouse will rebuke you					
F13. You do not seek leadership roles within the forest organizations because your spouse has discouraged you					
F14. You do not engage in forest patrol because your spouse has discouraged you					
F15. You do not participate in tree maintenance within the forest because your spouse has discouraged you					
F16. You do not engage in the exploitation of forest resources since your spouse has discouraged you					

F2. What is your level of agreement to the statements that '*time is a constraint to your involvement in the following forest management activities*? Kindly tick (√) where applicable.

Statement	Level of Agreement				
	SD	D	N	A	SA
F21. You fail to attend CFA meetings because you are very busy					
F22. You do not seek CFA leadership positions due to time limitations					
F23. You do not participate in forest patrol due to insufficient time					
F24. You fail to monitor the planted trees due to inadequate time					
F25. You do not engage in exploitation of forest products due to time constraints					

F3. What is your level of agreement to the opinion that financial challenge is a hindrance to your involvement in the forest governance activities? Kindly tick (√) where applicable.

Statement	Level of Agreement				
	SD	**D**	**N**	**A**	**SA**
F31. You fail to pay for the CFA subscription fees due limited finances					
F32. You do not pay the CFA membership subscription fees due to mismanagement of CFA finances					
F33. You do not engage in the maintenance of tree seedlings due to poor remuneration by the CFA					
F34. You do not engage in forest patrol due to poor remuneration by the CFA					
F35. You do not engage in exploitation of forest resources due to inadequate funds for permits					

F4. What is your level of agreement to the view that distance limits your involvement in forest governance activities?.

Statement	Level of Agreement				
	SD	**D**	**N**	**A**	**SA**
F41. You do not attend some CFA meetings because they are held very far					
F42. You do not engage in forest patrol because the forest is located very far					
F43. You rarely report illegal forest cases because the forest station and forest guard post is very far					
F44. You rarely monitor the planted trees since the forest is very far					
F45. You rarely engage in exploitation of forest resources since the forest is very far					

F5. What is your level of agreement to the opinion that insufficient forest information and training is a constraint to your involvement in forest governance activities? The level of agreement was assessed on Likert scale of 1-5 where: 1 = Strongly Disagree (SD), 2 = Disagree (D), 3 = Neutral (N), 4 = Agree (A) and 5 = Strongly Agree (SA).

Statement	Level of Agreement				
	SD	D	N	A	SA
F51. You rarely attend CFA meetings due to insufficient information about the venue and time of meetings					
F52. You rarely engage in articulation of forest laws and policies due to inadequate knowledge about forest policies and laws					
F53. You rarely participate in forest patrol due to inadequate training about forest scouting					
F54. You rarely engage in planting trees due to inadequate information about the source of tree seedlings					
F55. You rarely engage in exploitation of forest resources due to inadequate information about the access rights					

F6. What is your level of agreement to the statement that gender norms of behaviour are a hindrance to the involvement of women in forest governance activities? The level of agreement was assessed on Likert scale of 1-5 where: 1 = Strongly Disagree (SD), 2 = Disagree (D), 3 = Neutral (N), 4 = Agree (A) and 5 = Strongly Agree (SA).

Statement	Level of Agreement				
	SD	D	N	A	SA
F61. Women do not attend forest meetings because the culture dictates that they must attend with their husbands					
F62. Women do not speak during forest meetings because they are not given permission to speak					
F63. Women do not seek leadership positions in the CFA because they are inferior to men					
F64. Women do not engage in tree planting within the forest because it is against the culture					
F65. Women do not participate in forest patrol because they are weak and fearful					
F66. Women do not engage in the exploitation of some of the forest resources because it is against the cultural beliefs					

Appendix 2: Interview Schedule for the household key informants

I am a doctorate student pursuing Doctor of Philosophy in Geography, Moi University. I am conducting a research on the '***Gender Relations in Forest Governance and Use of Forest Resources within Cherangany Hills Forest, Kenya'***. This study is conducted purely for academic reasons. It is meant to assess your opinion and not to devalue or intimidate you in any way or whatsoever. Your identity will remain anonymous unless by your permission and that your responses will be regarded with uttermost confidentiality. In view of this therefore, I humbly request you to fill or be assisted to fill the attached questionnaire to the best of your knowledge.

Thank you.

RESPONDENT'S IDENTIFICATION

Sub-location_____Phone contact (optional)_____

A. <u>Nature and extent of involvement of men and women in Community Forest Association activities</u>

1. How do you and your spouse share the roles of paying the CFA subscription fees?

2. Why do you often attend forest meetings? Where do you attend? When do you attend?

3. Do the CFA leaders consult you with regard to forest management issues? If yes, about which issues?

4. To what extent do you engage in reforestation activities? What are the implications on the environment and livelihoods?

5. To what extent do you engage in the forest protection activities? What are the implications on the environment and livelihoods?

6. Do you intend to continue engaging in forest governance?

B. <u>Intra-household decision making powers and roles between husbands and wives over use of forest resources</u>

1. Do you and your spouse jointly make decision over exploitation of forest resources? If yes, over which forest products? If No, why not?

2. Do you and your spouse share responsibilities and rights over exploitation of forest resources? If yes, over which forest products? If No, why not?

3. Do you and your spouse jointly make decisions over sale of forest products? If yes, over which forest products? If No, why not?

4. Do you intend to continue engaging in exploitation of forest products? If Yes, which one? If No, why not?

C. <u>Implication of the gender sharing of decision making powers and roles in Community Forest Association activities and use of forest resources on livelihoods</u>

1. Do the sharing of decision making powers and roles between men and women during reforestation and forest patrol has led to sufficient access to income? If yes, how? If No, why not?

2. Do the sharing of decision making powers and roles between men and women during cultivation of crops in the forest lead sufficient access to food? If yes, how? If No, Why not?

3. Do the sharing of decision making powers and roles between men and women during the collection of pasture and grazing of animals in the forest has led to sufficient access to livestock feeds? If yes, how? If No, Why not?

4. Do the sharing of decision making powers and roles between men and women during the collection of vegetables and fruits has led to sufficient access to food? If yes, how? If No, Why not?

5. Do the sharing of decision making powers and roles between men and women during the collection of firewood from the forest has led to sufficient access to wood fuel? If yes, how? If No, Why not?

6. Do the sharing of decision making powers and roles between men and women during the preparation of herbal medicine has led to sufficient access to herbal medicine? If yes, how? If No, Why not?

D. Constraints and opportunities are available for men and women engaging in Community Forest Association activities and exploitation of forest resources?

1. To what extent do unequal gender relations hinder you from engaging in forest governance and exploitation of forest resources? How do you minimize the problem?

2. To what extent do time limitations hinder you from engaging in forest governance and exploitation of forest resources? How do you minimize the problem?

3. To what extent do financial constraints hinder you from engaging in forest governance and exploitation of forest resources? How do you minimize the problem?

4. To what extent do distance challenges hinder you from engaging in forest governance and exploitation of forest resources? How do you minimize the problem?

5. To what extent do inadequate forest information and training hinder you from engaging in forest governance and exploitation of forest resources? How do you minimize the problem?

6. To what extent do gender norms of behaviour hinder you from engaging in forest governance and exploitation of forest resources? How do you minimize the problem?

Appendix 3: Interview Schedule for other key informants

I am a doctorate student pursuing Doctor of Philosophy in Geography, Moi University. I am conducting a research on the '***Gender Relation in Forest Governance and Use of Forest Resources within Cherangany Hills Forest, Kenya'***. This study is conducted purely for academic reasons. It is meant to assess your opinion and not to devalue or intimidate you in any way or whatsoever. Your identity will remain anonymous unless by your permission and that your responses will be regarded with uttermost confidentiality. In view of this therefore, I humbly request you to fill or be assisted to fill the attached questionnaire to the best of your knowledge.

Thank you.

RESPONDENT'S LOCATION

Place of work_____Phone contact (optional)_____

1. What is the main role(s) of the CFA in reforestation? What are the environmental and economic benefits of involvement of men and women in reforestation activities?

2. What is the role of the CFA in formulation of forest laws, articulation of forest laws and forest patrols? What is the environmental and economic benefits of involvement in forest patrols?

3. How do members gain rights to exploitation of forest resources? What are the regulations for disqualification?

4. To what extent do financial constraints hinder CFA members from engaging in forest governance? How do KFS help to minimize the problem?

4. To what extent do distance challenges hinder CFA members from engaging in forest governance? How do KFS help minimize the problem?

5. To what extent do inadequate forest information & training hinder CFA members from engaging in forest governance? How do KFS help to minimize the problem?

6. To what extent do gender norms of behaviour hinder CFA members from engaging in forest governance? How do KFS help to minimize the problem?

Appendix 4: Evidence of research proposal

MOI UNIVERSITY
(ISO 9001:2015 CERTIFIED INSTITUTION)

SCHOOL OF ARTS & SOCIAL SCIENCES

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P.O Box 3900
ELDORET
KENYA

13th November, 2019

NACOSTI (National Commission for Science, Technology and Innovation),
P.O. Box 30623,
Utalii Hse,
NAIROBI.

Dear Sir/Madam,

RE: EDWIN ANAKADI BUTIYA JUMA – SASS/DPHIL/GEO/02/2019

This is to certify that the above named is a bonafide student at Moi University, School of Arts and Social Sciences. He is a Doctor of Philosophy (DPhil) student in Geography.

He has completed his coursework component and proposal and has now embarked on Thesis writing.

His Thesis is entitled: **"Gender Relations in Forest Governance and Use of Forest Resources in Cherangany Hills Forest, Kenya".**

Any assistance accorded to him will be appreciated.

DEAN
SCHOOL OF ARTS &
SOCIAL SCIENCES
MOI UNIVERSITY

PROF. P.T. SIMATEI
DEAN, SCHOOL OF ARTS AND SOCIAL SCIENCES

Appendix 5: NACOSTI Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 609951

Date of Issue: 18/November/2019

RESEARCH LICENSE

This is to Certify that Mr.. Edwin Juma of Moi University, has been licensed to conduct research in Elgeyo-Marakwet, Transnzoia, Westpokot on the topic: Gender Relations in Forest Governance and Use of Forest Resources in Cherangany Hills Forest, Kenya for the period ending : 18/November/2020.

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