

**IMPACTS OF DECENTRALIZED GOVERNANCE ON FOREST
CONSERVATION AND COMMUNITY LIVELIHOODS IN KAKAMEGA
AND LOITA FORESTS, KENYA**

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DECLARATION

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To my mother Kavana Mbuvi for her encouragement and enthusiasm towards my education.

To my wife, Esther Mũsingo and our children Purity Kanini, Timothy Kitunguu and Aurelia Lena.

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LIST OF ACRONYMS AND ABBREVIATIONS

ANOVA	Analysis of Variance
C&C	Command and Control
CAMPFIRE	Communal Areas Management Programme for Indigenous Resources
CDF	Constituency Development Fund
CDTF	Community Development Trust Fund
CF	Community Forestry
CFA	Community Forest Association
CFUG	Community Forest User Group
CS	Cabinet Secretary
CSO	Civil Society Organisation
DBH	Diameter at Breast Height
DDC	District Development Committee
DFRD	District Focus for Rural Development
DFS	District Forest Service
EC	Ecosystem Conservator
FAC	Forest Adjacent Community
FCC	Forest Conservation Committee
FGD	Focus Group Discussion
FMA	Forest Management Agreement
FUG	Forest User Group
HoC	Head of Conservancy
IBA	Important Bird Area
IEA	Institute of Economic Affairs
IGA	Income Generating Activity
JFM	Joint Forest Management
KEEP	Kakamega Environmental Education Programme
KEFRI	Kenya Forestry Research Institute
KF	Kakamega Forest
KFNR	Kakamega Forest National Reserve
KFR	Kakamega Forest Reserve
KFS	Kenya Forest Service

KI	Key Informant
KWS	Kenya Wildlife Service
LCF	Loita Community Forest
MENR	Ministry of Environment and Natural Resources
MEWNR	Ministry of Environment, Water and Natural Resources
MoU	Memorandum of Understanding
NFA	National Forest Authority
NG	National Government
NGO	Non-Governmental Organisation
OECD	Organisation for Economic Co-operation and Development
PA	Protected Area
PELIS	Plantation Establishment and Livelihoods Improvement Scheme
PFM	Participatory Forest Management
PFMP	Participatory Forest Management Plan
PS	Principal Secretary
GoK	Government of Kenya
SPH	Stems Per Hectare
TCBFM	Traditional Community Based Forest Management
UNDP	United Nations Development Programme

ABSTRACT

There is a global trend towards decentralizing the management of forests. Forestry decentralization in Kenya is relatively new with enabling legislation having been promulgated in 2007. The impact of decentralization on forest management and livelihoods has not been adequately studied. The study overarching aim was to assess the impacts types of forest governance on forest conservation and community livelihoods, analyse the institutional factors that support and constraint decentralization of forest governance and recommend how to appropriately implement decentralized forest management in Kenya. The study was conducted in three sites: community regime in Loita Forest, full government control (government regime) in Kakamega Forest National Reserve (KFNR) and Participatory Forest Management (PFM) regime in Kakamega Forest Reserve (KFR). Households adjacent to the forests under study were randomly selected and questionnaires administered. Recall questions were administered to households in the PFM regime in order to attribute any observed livelihood impact at household level to PFM; Key informants from government departments as well as local and international non-governmental institutions were interviewed. Changes in forest condition and area over the last 30 years were determined through interpretation of satellite images using fragmentation analysis and confirmed through ecological studies. Data were analyzed using descriptive, parametric and non-parametric statistics and evaluated at P=0.05 level of significance. Chi-square tests and simple linear regression were conducted to explore perceived decentralization management scenarios and to check the relationship between quantity of resource accessed and distance into the forest as well as other quantitative characteristics of the household respectively. It was observed that promulgation of The Forests Act, 2005 revised to The Forest Conservation and Management Act (2016) was a bold step that signalled the start of decentralization of forestry governance in Kenya. The households in the government regime (84.5%) and the community regime (78.2%) indicated that the forest was better managed compared to 55.7% in the PFM regime. Joint community and government management individually did not contribute optimally to better forest management but it was perceived to have more benefits. The households and policy-makers respondents indicated that there was change in forest condition with the community noting a significant decrease of forest size across the different forms of management ($\chi^2 = 27.614$, $p < 0.05$). This was confirmed by satellite images analysis. Though the government regime approach was good for biodiversity conservation, it contradicted concepts of sustainable development, does not enhance equity and impoverish communities. In the PFM regime, the policy-makers indicated forestry management was under decentralization (87.2%) and PFM was the major management approach (58%) applied in Kenya. Though the study indicates that each regime was appropriate in its own context, PFM regime was indicated to be the preferred regime because it: facilitates better forest management and improved household livelihoods; ensures that the five types of property rights are not the preserve of one stakeholder; was drifting towards devolution; was facilitating the subsidiarity principle and does not negatively impact on the greater common good; was empowering the partners at all levels; ensures the communities have tenure rights over some forest products and there are incentives in place to manage the forest sustainably. The PFM regime ensures the State decentralize power to Community Forest Associations (CFAs). It confers legitimacy through election of CFA by members whom they all interact with and whom they are accountable to. This enables the community to build social capital necessary for better forest management and improved household livelihoods.

CHAPTER ONE

INTRODUCTION

This chapter is divided into eleven sections with section 1.1 providing chapter outline. Section 1.2 provides background information on decentralized forest governance. The problem being addressed by the study is discussed in section 1.3 while sections 1.4 and 1.5 provide the purpose of the study and justification for the study respectively. Research questions are outlined in section 1.6. Research objectives are outlined in section 1.7 with study hypothesis being discussed in section 1.8. Significance and outputs of the study are outlined in section 1.9 with conceptual frameworks and definition of key terms used in the study being outlined in section 1.10 and 1.11 respectively.

1.1 Background Information

The involvement of several stakeholders in forest management, especially communities, emerged in different places between the 1970s and 1990s. This was a response to a combination of factors, but key drivers have been forest degradation and deforestation occurring as a result of decades of overexploitation from industrial logging (Poffenberger, 2006, as cited in Charnley & Poe, 2007). Decentralization has emerged as a worldwide trend towards increasing transfer of power, resources and responsibilities to the sub-national levels of government and organized community groups. Decentralizing forest governance refers to the restructuring or reorganisation of authority resulting in a system of co-responsibility between institutions of governance at the central, regional and local levels according to the principle of subsidiarity, thus increasing the overall quality and effectiveness of the system of governance, while increasing the authority and capacities of sub-national levels (UNDP, 1999).

Decentralization is a major strategy through which many nation-states are striving to achieve development goals, provide public services and undertake environmental conservation (Agrawal & Ostrom, 2001). Decentralization can be defined as the extent to which power is held by autonomous elected sub-national governments capable of taking binding decisions in at least some policy areas (Burki et al., 1999, as cited in Sharma, 2005). Decentralization can appear in the form of devolution of major functional responsibilities, sometimes accompanied by increases in the fiscal transfer to sub-national governments thus collectively ceding the fiscal input to the sub-central entities. Devolution is generally conceived as a policy that aims to include a more diverse set of actors in forest management (Sikor & Thanh, 2007). According to a study by the World Bank in 1994, out of 75 developing and transitional countries with population greater than 5 million, all but 12 claim to be embarked on some form of transfer of political power to local units of government (Agrawal & Ribot, 1999).

Decentralization has three fundamental dimensions, which may occur independently, or jointly; the political, the administrative and the fiscal (Nyanjom, 2011). Agrawal and Ribot (2000) indicated that if decentralization is to have significant impact, it must entail a mixture of all the three dimensions. Administrative decentralization has three distinct forms distinguished by matters delegated, the process and the level of transfer of responsibilities. This gives three different administrative decentralization forms; deconcentration, delegation and devolution (Nyanjom, 2011).

Decentralization has been viewed as the means to increase environmental management efficiency and improve equity and justice for local people, many environmentalists have advocated for participatory and community-based natural resource management as was observed by Ribot (2002). Decentralization of natural resource management is intricate because it is aimed at increasing service efficiency,

democracy, devolution of powers over the disposition of resources, improving community livelihoods and management of divergent multi-stakeholder interests while ensuring equity of costs and benefits (Bulut & Abdow, 2018). Further, natural resources have political and economic dimensions beyond those of other sectors, such as health and education that increase level of conflict and resistance to decentralization policies (Larson & Soto, 2008).

Large-scale decentralization in forestry started in the late 1980s (Agrawal & Ribot, 1999), though there were isolated earlier initiatives dating back to 1931 in Kumaon, India. Nepal, a pioneer in forestry decentralization, commenced the process in 1978 with the passing of the Community Forestry Act, 1978 (Agrawal & Ribot, 1999). Also, Uganda had first attempt to decentralize the forestry sector by establishing legislation for establishing local forest reserves under the District administration in 1939 – 1947 (Banana, Ongugo, Bahati, Mwangi & Anderson, 2008).

Since the beginning of the 1990s, waves of natural resources management decentralization experiments have been implemented in Africa, generating both positive and negative impacts (Oyono, 2005). The decentralization process gained momentum in Uganda again in 1993. In Kenya, forestry decentralization is relatively new with enabling legislation having been approved in 2007 (Banana et al., 2008). Forest governance decentralization process in Africa can be summarized as a transfer of management rights and responsibilities to peripheral actors, local groups and local communities (Oyono, 2004).

Through decentralization, desired impacts may not always be achieved as in Zimbabwe's Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) experience; powers were not transferred to the rural communities but to District Development Committees (DDCs) which were largely controlled by the

central government (Agrawal & Ribot, 1999). Central governments in some countries have failed to decentralize all aspects of natural resources. A good example was the case in Senegal where responsibilities in forest management were devolved to local elected councils without devolving access to the related commercial profits (Agrawal & Ribot, 2000).

In 2010, Kenya promulgated a Constitution that is very clear on devolved management and individual rights to the environment (Government of Kenya - GoK, 2010a; Bulut & Abdow, 2018). This has given impetus to integrate the existing sector-specific decentralization policies. The new Constitution requires appropriate strategies and an enabling legislation as was emphasised by Vision 2030 which indicates that Kenya will adopt a democratic decentralization process with substantial devolution in policy-making, public resource management and revenue sharing through devolved funds (GoK, 2007). There is need to provide the necessary policy environment as the country starts to implement the Constitution of Kenya 2010 which provides for devolved structures of government. These would enhance the Constitutional goal of the decentralization/devolution by giving the people at the grassroots more control over decisions and governance actions that affect them directly (GoK, 2010a). It was anticipated that this would greatly contribute to the improvement of their standards of living as well as eradicate three challenges facing the nation; corruption, tribalism and impunity (Institute of Economic Affairs, National Council of Churches of Kenya & Diakonia - Sweden, 2011).

Kenya has formulated several sector-wide decentralization programmes since independence in 1963 including: District Development Grant Program (1966), Special Rural Development Program (1969/1970) and District Focus for Rural Development (1983/1984). Though ingenious, these programmes suffered from lack of funding and

excessive bureaucratic capture by the central government (Khadiagala & Mitullah, 2004, as cited in Bagaka, 2008). Other sector decentralization policies in Kenya include: Rural Urban Balance Strategy (1986), Secondary School Education Bursary (1993), Roads Maintenance Levy Fund (1993), Local Authority Transfer Fund (1998), Constituency HIV and AIDS Fund (2001), Free Primary Education Fund (2003), Constituency Secondary Education Bursary Fund (2003), Constituency Development Fund (2003) precursor to National Government Constituencies Development Fund (2015), Youth Enterprise Development Fund (2006), Women Enterprise Development Fund (2007) and Free Secondary Education Fund (2008) (Bagaka, 2008; Khaunya, Wawire & Chepng'eno, 2015; Wagana, 2017; Bulut & Abdow, 2018). These later initiatives have received funding but are facing challenges of accountability, legislative, political and elite capture unlike the earlier initiatives (Khaunya et al., 2015).

In Kenya, the forestry sector has been undergoing important transitions in administrations, roles, functions and orientation. This study was done when The Forests Act (GoK, 2005a) was operational. The key transition outcomes include: promulgation of The Forests Act, 2005 revised in 2016 in line with The Constitution 2010 to The Forest Conservation and Management Act, 2016, and recognition and partnering with Non-Governmental Organisations (NGOs), Civil Society Organisations (CSO) and communities in forestry management (GoK, 2016a). These new entrants have put pressure on the government to be assigned forest management roles.

Additionally, they expect the government to adopt better forest management practices including decentralization where communities should benefit and participate in forest management. This has led to the start of use of legal instruments like Forest

Management Agreements (FMAs) and Memorandum of Understanding (MoU) at three levels: (i) at national level between government departments like Kenya Forest Service (KFS) and Kenya Forest Research Institute (KEFRI), (ii) between civil society and different government departments, and (iii) at forest level where pilot decentralization projects have been implemented jointly by government, civil society and community groups. The performance of these decentralization schemes has not been recently analysed and there is a need to understand how they are performing and impacting on the conditions of the forests and community livelihoods (Warui, 2017).

1.2 Problem Statement

There has been increasing pressure on the Kenyan government to protect natural forests as the forest resource is being degraded (Wass, 1995). Between 1990 and 2015, forest land decreased by 311,000 Ha (GoK, 2016b). According to the National Forest programme, there has been a recent increase in forest cover from 6.01% in 2000 to 7.46% in 2015 (GoK, 2016b). The increased forest cover is mostly the result of on farms tree-growing, while natural forests still remain highly threatened (GoK, 2016b). Loss of natural forest has been exacerbated by failure to have the local communities benefit formally from the forest resources. There was a perception that the failure to give the local people the power to manage “their” resources greatly contributed to resource degradation and that decentralization could reverse this negative trend (Warui, 2017). Decentralization has therefore been introduced as a means for service delivery improvement through devolution of power and authority for better forest management and improved benefits to the local communities and other stakeholders.

According to Ribot (2002), one of the first lessons learnt from decentralization experience around the world is that despite stated government commitment to

decentralization, central governments and environmental ministries resist transferring appropriate and sufficient powers to local authorities. The natural resources management problems vary in different parts thus calling for development of site-specific strategies in management and conservation of forests. In Kenya, the impacts of decentralized governance of forests have not been fully determined (Guthiga, 2007). Decentralization of forest management is both a policy and a political option within a larger body of reforms oriented towards forest governance. The current decentralization process can be summarized as a transfer of management rights and responsibilities to peripheral actors, local groups and local communities (Oyono, 2004). Although forest management has been decentralized to varying extents in several forests in Kenya, there is a need to assess whether the key objectives of decentralized governance for better management and improved livelihoods have been achieved. This study aimed to fill this research gap by determining the impacts of three forest management regimes found in Kenya, including (i) exclusive community management in Loita Community Forest (LCF) referred to as the Community Regime (CR); (ii) a Command and Control (C&C) or the government regime in Kakamega Forest National Reserve (KFNR) and (iii) Participatory Forest Management (PFM) regime in Kakamega Forest Reserve (KFR). The purpose of the study was to provide analysis on how decentralization in forest resource management in Kenya has impacted (positively or negatively) on forest conservation and community livelihoods; provide a framework on how decentralization in forest sector would be appropriately implemented under different management regimes.

1.3 Justification of the Study

In many developing countries, forests have been under State control since colonial times (Katila, 2008). The failures of the centralized resource management approaches

led to most governments seeking alternative management approaches (Katila, 2008). Decentralizing the management of the forests has been viewed as the most feasible approach (Warui, 2017). Decentralization is based on the principle of subsidiarity, which assigns specific functions hitherto conducted by the centre (of an entity) to the lowest feasible sub-centre on the periphery (Anderson, 2000; Nyanjom, 2011).

Decentralized forest governance is part of the solution for most of the critical issues related to sustainable forest management. It facilitates greater participation in public decision-making, improving efficiency, revenue generation, equity, development, monitoring and evaluation and better resource management. Many conservationists have argued that when communities who live in close proximity to natural resources help to manage them, there is a better chance that the resources will be protected (Wyckoff-Baird, Kaus, Christen & Keck, 2000; Persha, Agrawal & Chhatre, 2011). In this sense, decentralization is a strategy of governance to facilitate the transfer of power closer to those who are most affected by the exercise of power (Agrawal & Ribot, 2000). The challenge as observed by Contreras-Hermosilla, Gregersen and White (2008) is that there is general reluctance among decision-makers and public sector administration to devolve actual power and resources to the local level of government.

Given the right conditions, decentralized governance is superior to centralized governance in improving the quality of public management and responsiveness to variations in citizen wants and needs, thereby leading to enhanced and more equitable development (Contreras-Hermosilla et al., 2008). Oyono (2004) further emphasises that decentralization can generate a greater sense of ecological responsibility among non-state actors, environmental justice and better governance.

Decentralization of forestry management in Kenya was characterized by formation of committees at defined levels such as Community Forest Associations (CFAs) at forest station level, county and sub-county conservation committees, and Forest Conservation Committee (FCC) at the conservancy level (GoK, 2016a). These committees have a defined legal composition and mandate as stated in The Forest Conservation and Management Act, 2016. The FCCs have a national link through a clear administrative mechanism of informing the KFS Board of Management. Prior to The Forest Conservation and Management Act, 2016, pilot activities were established in some forests, where stakeholders have been participating for more than 18 years (Mbuvi & Musyoki, 2013).

These impacts of decentralizing governance on forest management under three different governance regimes: (i) fully decentralized to communities, (ii) centralized, and (iii) jointly managed by government and communities were assessed to enable the government, community, donors and civil society to determine the kind of impact decentralization was having on forest conservation and whether it was leading to improved community livelihoods. The study also assessed the appropriateness of each governance regime and proposes ways of improving decentralization under each governance regime.

1.4 Research Questions

The study was guided by the following research questions:

- 1) How do policy-makers' perceive forest decentralization in Kenya?
- 2) Does decentralization of forest governance lead to better forest conservation in Kenya?
- 3) Does decentralization of forest governance lead to improved community livelihoods in Kenya?

- 4) Which institutional (policy legislation and organisational) factors have the most influence on forest governance?

1.5 Research Objectives

The broad aim of this study was to assess the impacts of decentralized forest governance on forest conservation and community livelihoods. The specific objectives were:

- 1) To assess policy-makers' perceptions on the aims of forest decentralization in Kenya.
- 2) To evaluate whether decentralization of forest governance leads to better forest conservation in Kenya.
- 3) To examine whether decentralization of forest governance leads to improved community livelihoods in Kenya
- 4) To analyse the institutional (policy, legislation and organisational) factors that support and constrain decentralization of forest governance in Kenya.

1.6 Hypotheses

- 1) The main intention of decentralizing forest governance is to achieve better forest conservation.
- 2) Decentralization of forest governance can significantly lead to better forest conservation
- 3) Decentralization of forest governance significantly leads to improved community livelihood

1.7 Significance and Anticipated Output

The study provides a report on the impacts of three forest governance regimes on forest conservation and their perceived impact on community livelihoods. The

conservation status assessment report can facilitate development of more effective conservation strategies for forests under defined decentralized forest governance regimes. The perceived impact of different forest management regimes on community livelihood can contribute to the development of better livelihood improvement strategies for Forest Adjacent Community (FAC) under different types of decentralization. The results would contribute towards the review of the forest policy and development of subsidiary legislation and guidelines. The other outputs of this study include: a Ph.D Thesis, a policy brief and two journal papers.

1.8 Conceptual Framework

The conceptual framework for this thesis assumes that forest management regimes are ultimately intended to achieve two main desired outcomes: improved livelihoods and better forest condition (Figure 1.1). While there are multiple ways of measuring livelihoods, key elements that are affected by forests are household income, their ability to invest, and their access to forest resources and funding. The frameworks indicates that better forest conservation could be measured by the spatial extent of the forest and the quality (e.g. species richness, basal area, regeneration and level of degradation) of the forest. The existence of forest management systems like management plans as a proxy for adaptive management and hence longer-term sustainability is also used as a measure of better conservation.

The conceptual framework recognizes that there are multiple types of forest governance regime (independent variables), all of which could result in desired conservation and livelihood outcomes (dependent variables). The conceptual framework indicates that there are a number of “influencing factors” (intervening variables – forest management and policies and legislation) that mediate the impacts

of different governance regimes on the desired livelihood and conservation outcomes (Figure 1.1).

The framework recognizes that there are two extremes of the spectrum where, at one end (community regime), communities are in control of their resource with no government participation, while at the other (government regime), the government is in full control and the communities' access is almost negligible. The framework appreciates that in Kenya, a third regime PFM has been emerging. This regime is characterized by communities being granted a defined bundle of rights (RRI, 2012) to participate in forestry management under a legally negotiated participatory process between the community and the government (GoK, 2016a).

Though there was desire by communities and some NGOs and civil society in Kenya to have resources fully decentralized (community regime - traditional community based forest management) to them, achieving this remains a challenge as policy-makers and managers are reluctant to accept any decentralization initiative that would reduce their power. The Community Land Act, 2016 (GoK, 2016c) passed on 31st August 2016, may promote decentralization of forest governance as communities obtain official ownership of their lands. Community regime main objective is community livelihoods while government regime is concerned with biodiversity conservation. The intervening variable would vary the desired outcomes. The conceptual framework premises that PFM is structured legally to contribute to forest conservation and improved community livelihoods. Thus, the conceptual framework recognizes that no single forest governance regime is necessarily the best in all contexts. For example, extreme decentralization to a single stakeholder can be risky because of competing individuals, local and national interests, inadequate legal support system, imbalances in power and authority among the stakeholders and the

practice of excluding others embedded in the traditional system, high poverty levels and elite capture (Ribot, 2004; KFS, 2015a).

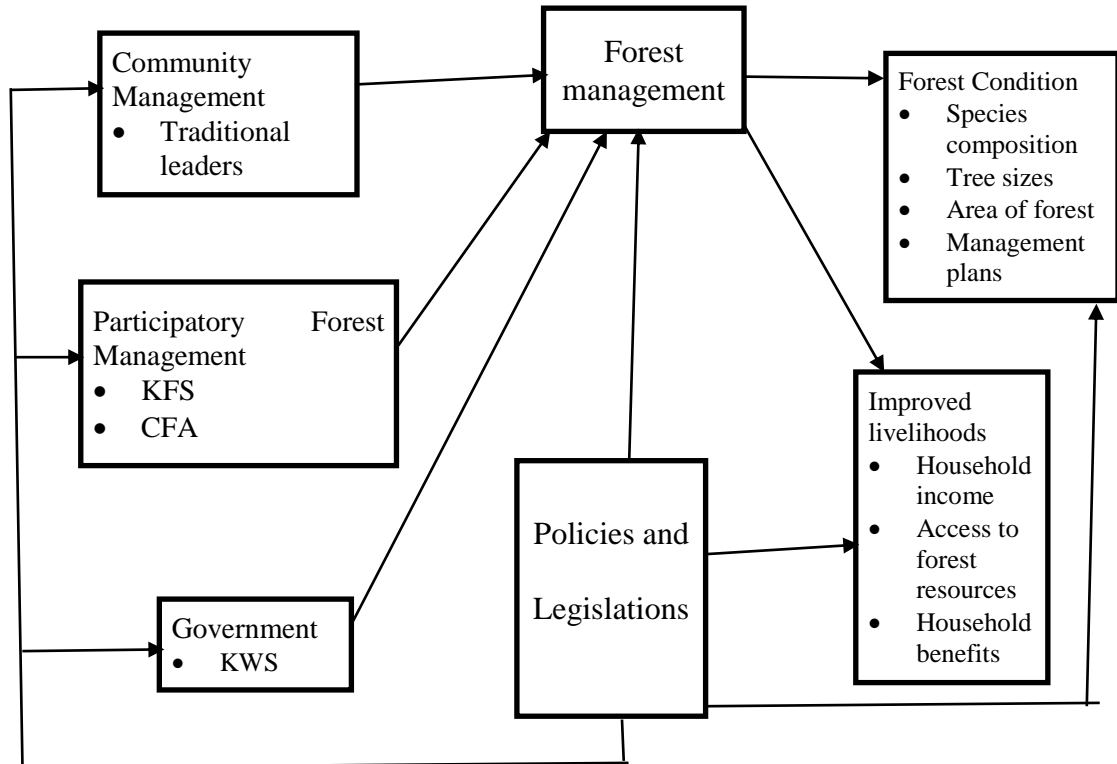


Figure 1.1: Conceptual framework linking forest governance regimes and desired outcomes

1.9 Definition of Terms

Community Forestry: This is the governance and management of forest resources as common property by its users (owners) using democratic principles and a bottom-up process of decision-making to achieve political, economic, social, cultural, and environmental goals, without compromising interests of other concerned stakeholders or of future generations (Malla, 2009).

Conservation: The management of human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential

to meet the need and aspirations of future generations (IUCN-UNEP-WWF, 1980; Chebii, 2015).

Decentralization: Refers to any act in which a central government formally cedes powers and resources to actors and institutions at lower levels in a political-administrative and territorial hierarchy (Ribot, 2002).

Deconcentration or Administrative Decentralization: This involves the transfer of power to local branches of the central State such as prefectures, administrators, regions, counties or local technical line ministry agents whose primary responsibility is to the central government (German et al., 2010).

Delegation: Is the transfer of responsibilities and authority to semi-autonomous entities that respond to the central government but are not totally controlled by it. Public forestry corporations are some examples of this form of decentralization (Contreras-Hermosilla et al., 2008).

Devolution: This refers to the transfer of political, administrative and fiscal management power between central government and lower levels of government (Potter, 2001, as cited in Institute of Economic Affairs, 2006).

Fiscal Decentralization: This involves the delegation of spending responsibilities and some revenue raising powers to sub-national government (Institute of Economic Affairs, 2006).

Forest Governance: Refers to the way in which people and organizations rule and regulate forests and allocate and secure access to, rights over and benefits from forests, including the planning, monitoring and control of their use, management and conservation (Coi, Nghi & Bodegom, 2011).

Forest Fragmentation: This refers to a process during which a large expanse of forest habitat is transformed into a number of smaller patches of smaller total area,

isolated from each other by a matrix of habitats unlike the original (Fahrig, 2003, as cited in Chapungu, Takuba & Zinhiva, 2014).

Governance: The exercise of economic, political and administrative authority to manage a country's affairs at all levels (UNDP, 1999).

Household: Normally consists of a man, wife and children who live in the same house, share meals or living accommodation, and in some cases consists of relatives who are wholly dependent on the household.

Impacts: These include positive and negative, long-term or durable, direct or indirect, intended or unintended effects resulting from the implementation of a project (OECD, 2010).

Indicator: Is a quantitative or qualitative factor or variable that provides a simple and reliable means to measure how well a desired outcome, value or criterion is being achieved or fulfilled (OECD/DAC, as cited in Schreckenberget al., 2010).

Land Cover: Refers to the vegetative or non-vegetative characteristics (artificial constructions) of a portion of the Earth's surface (Burley, 1961, as cited in J. R. Anderson, Hardy, Roach & Witmer, 1976; Siderelis and Nagy, 1994).

Land Use: Refers to some human activity on the earth surface (Siderelis and Nagy, 1994).

Livelihood: It comprises the capabilities, assets (including both material and social resources) and activities required for a living (Chambers & Conway, 1991). In the context of this thesis the focus is on income and subsistence use of the forest

Manyatta: Homesteads composed of several clusters of unrelated homesteads in one enclosure mainly for social security (Mbuvi, Musyoki & Ongugo, 2015).

Outcomes: These are intended or achieved short and medium term behaviour or systemic effects of an intervention's outputs that are designed to help achieve the project's impacts (Schreckenberg et al., 2010).

Outputs: These are immediate, tangible and intended goods and services (Schreckenberg et al., 2010).

Participatory Forest Management: Refers to a forest management approach, which deliberately involves the forest adjacent communities and other stakeholders in management of forests within a framework that contributes to community's livelihoods (KFS, 2015a).

Policy-maker: A person responsible for making policy, especially in government. In this study, it includes those persons who make decisions at low levels of government and at community level.

Political or Democratic Decentralization: This is a scenario that occurs when powers and resources are transferred to authorities representative and downwardly accountable to local populations (Omolo, 2010).

Preservation: This refers to attempts to maintain in their present condition, such as area of the earth's surface as do not yet bear the obvious marks of man's handiwork, and to protect from the risk of extinction those species of living beings which man has not yet destroyed (Passmore, 1980, as cited in Chebii, 2015).

Protected Area: This refers to a geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature and associated ecosystem services and cultural values (Borrini-Feyerabend et al., 2013).

Regime: Refers to a defined management system (Ribot, 2002).

Traditional Community-Based Forestry Management: This is a management regime where the whole community through indigenous systems is fully managing and owning the resource based on representative authority with the traditional leader being the custodian of ownership and management authority (Mbuvi et al., 2015).

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter is divided into eight sections with section 2.1 providing a general outline of the chapter. Section 2.2 gives an overview on decentralization and management of forest resources and section 2.3 discussing a global perspective on decentralization. Section 2.4 provides details on decentralization of forestry in Africa. A general historical review of decentralization in Kenya is outlined in section 2.5. Section 2.6 provides an analysis of decentralizing governance of forestry management in Kenya while sections 2.6 and 2.8 provide details on factors influencing the outcomes of decentralization and decentralization knowledge gaps respectively.

2.2 Decentralization and Management of Forest Resources

Decentralization is a set of institutional arrangements among public institutions and social actors that emerge from a broader process. Decentralization has two principal dimensions: (1) top-down measures aimed at transferring political, administrative and/or fiscal responsibilities to lower levels of government, and (2) the gradual opening of spaces for participation from below, induced by the actions of social movements and local governments that challenge the traditional (centralized) way in which public policy decisions have been made (Larson, Pacheco, Toni & Vallejo, 2007).

Decentralization is a means for instituting good governance practices in forestry and requires several actors and factors including civil society, CFAs, the private sector, donors and NGOs. Further, governance is the process of decision-making and the process by which decisions are implemented or not implemented (Institute of Economic Affairs, 2011). Governance is generally considered “good” if it is

characterized by stakeholder participation, transparency of decision-making, rule of law and predictability (Institute of Economic Affairs, 2011). “Good governance” is also associated with efficient and effective management of natural, human and financial resources and fair and equitable allocation of resources and benefits (FAO, 2012).

Forest sector governance is defined as the *modus operandi* by which people, stakeholder groups and institutions (both formal and informal) acquire and exercise authority in the management of forest resources, to sustain and improve the quality of life for those whose livelihood depends on the sector (World Bank, 2009). Further, the quality of governance often determines whether forest resources are used efficiently, sustainably, equitably, and whether countries achieve forest-related development goals (FAO, 2011). Forest governance is good if it allocates and manages forest resources efficiently, effectively and equitably. It should also respect the policy and legislations, enhance transparency and provide for free flow of information, offer fair stakeholder participation and equity, provide for high levels of accountability, effective management of public resources and control of corruption (World Bank, 2009). Poor governance is a major impediment to achieving development outcomes of the forest sector as it results in losses of income, government revenues; local and global environmental services (FAO, 2012). Improving forest governance requires a systematic approach to identifying areas of weakness, devising and implementing suitable responses, monitoring results, continuing adaptation and learning to ensure progress (FAO, 2011).

Centralized State management of forests is costly, financially unsustainable and creates animosity between resource stakeholders leading to deforestation and degradation, and poverty among the forest adjacent communities (Banana et al.,

2008). Decentralization of natural resource management is aimed at increasing service efficiency, democracy, devolution of powers over the disposition of resources, improve community livelihoods and manage divergent multi-stakeholder interests while ensuring equity of costs and benefits. It is assumed that when those people most directly in contact with a forest have the power to decide how to manage and have viable economic alternatives to forest degradation, they will conserve the forest resource (Wyckoff-Baird et al., 2000).

Decentralization is implemented under the premise that it is a phased process and under a presumption that the central government will transfer powers and authority to the county units of government and community organisations at equivalent hierarchical levels. Decentralization of environmental management, at its core, constitutes a partnership between governments and communities leading to central State withdrawal from a specified domain of activities and transfer of decision-making authority to lower levels (Agrawal, 2001). The shift to community participation in forest management has been prompted by what some see as the ineffectiveness of centralized State control on resource management and recognition of the local operational structures and knowledge that groups possess (Obare, 2003).

2.3 Decentralization: Global Perspective

Interest in decentralization began during the 1980s and represented a striking reversal from the advice that dominated earlier ideas of development where centralized decision-making was seen as a way to rationalize scarce resources and depoliticize the masses while decentralization was viewed as likely to heighten cleavage; political, racial, ethnic and religious (Schneider, 2003, as cited in Sharma, 2005). “Natural resources play a special role in local democratization because local populations rely on them for their daily livelihoods and governments rely on them as a source of

wealth” (Ribot, 2003). “Local representative bodies need powers over resources that affect their constituencies in order to become legitimate actors around which civil society and citizens rally for justice, sustainable livelihoods and economic improvement” (Ribot, 2003). Further, Agrawal and Ribot, (2000) argue that if powers are decentralized to actors who are not accountable to their constituents, or who are accountable only to themselves or superior authorities within the structure of the government, the decentralization is not likely to accomplish its stated aims.

Following an initial swing towards extreme forms of decentralization, the development paradigm currently seems to have come of age with a renewed appreciation of the sub-national public sector (Sharma, 2005). The opportunity of partnership has been taken up globally with at least 35 countries having enacted new forest laws or drafted a new forest law since 1990 (Katila, 2008). Many countries embarked on decentralization in response to demands for better management of natural resources, including forests, and for more equitable and fair sharing of benefits derived from them (German et al., 2010). Decentralization has been viewed as a feasible solution to internationally recognized forestry problems such as illegal logging and uncontrolled deforestation that are increasingly being blamed on weak governance (Gregersen et al., 2004; Warui, 2017).

An estimated 60 countries are currently engaged in the process of decentralizing governance of their forest sector and this trend is getting popular (Gregersen, et al., 2004). The countries are at different stages, with diverse contexts, needs and stakeholders (Gregersen, et al., 2004). The Rio declaration and Agenda 21 in 1992 proposed that decisions over nature should be taken with greatest participation at the most local level possible (Latif, 2002). Today, participation is being institutionalized in the form of local democracy under the banner of decentralization (Latif, 2002).

Decentralization policies in the least developed countries have emerged in response to failed centralized natural resource governance programmes because high-value natural resources are distributed unequally, with central governments often reaping more than local-level users (Lawrence & Watkins, 2012).

Forestry decentralization has been implemented in several countries of the world under the premise that decentralization improves conservation and management of natural resources. Sharma (2005) points out that the reasons behind the interest to decentralize are diverse and different countries and regions may have different motivations and objectives for adoption of decentralization which play a role in determining how the process of decentralization will be carried out and the final outcome. Some countries including India and Nepal have devolved limited rights to local communities to manage and benefit from forests that are still officially considered public land. The Forest Departments have retained significant control over how commercial benefits from the sale of timber will be realized and allocated (Agrawal & Ribot, 2000; Gurung, Karki & Bista, 2011). In Kumaon India, local populations access a small share of revenue from commercial use of forests with community access to commercial profits being even more limited in the Nepal Terai area which is very rich in timber (Agrawal & Ribot, 2000).

Nepal's community forestry has become an example of progressive legislation and policies in the decentralization of forest management (Dahal & Chapagain, 2008). The forestry decentralization in Nepal has attracted international attention because it is linked to emerging issues including; sustainable forest management, forest governance, policy advocacy, equity, gender, poverty and the role of civil society in community forestry. The Forest User Groups (FUGs) model has been adopted in several countries where in Nepal, the user groups' network involvement in legal

advocacy, capacity building and the establishment of democratic governance on a wider scale shows the unique strength of the community forestry approach in Nepal (Gurung, et al., 2011). The enactment of Nepal's Forest Act in 1993, has witnessed the government of Nepal hand over parcels of national forests mainly in the mid-hills to local communities based on a forest management plan agreed between the Forester and the local forest user groups and approved by the District Forest Office (Katila, 2008).

2.4 Decentralizing Governance of Forestry Sector in Africa

At independence, most African countries inherited the colonial governance systems as they were without making any significant adjustments to fit the new political, social and economic situation (Kariuki, 2008). Further, modern governance systems continued being superimposed on the traditional institutions and the indigenous management systems of the community (Kariuki, 2008). In the last decade or so, forest governance decentralization has gained prominence as an expressed goal or as an actual programmatic pursuit in the context of or as a consequence of two prominent movements affecting the African State as observed by Ndegwa (2002). One consists of structural adjustment programmes that sought to reform the public sector in the 1980s while the other is the on-going transition toward more democratic and competitive politics started in the 1990s (Ndegwa, 2002).

Decentralization in Africa was taken up mainly as a means for reducing State expenditure through down-sizing while at the same time providing local government and communities with expanded political space and a share of the benefits as they take up the decentralized responsibilities and fill roles previously performed by central governments (Capistrano, 2010). The first attempt to decentralize in Africa goes back to the 1960s in Mali, Burkina Faso and Senegal, even though Senegal

became the only country in Africa to establish rural councils in 1972 (Diaw, 2010). Most countries in the African region embarked on the path of decentralization in the late 1980s and early 1990s as part of a global movement through structural adjustment programmes – largely under pressure from international donors and multilateral agencies, notably the World Bank and the International Monetary Fund (IMF) (Capistrano, 2010).

Africa does not have a long history of decentralized forest management even though since independence, several African countries have experimented with decentralization of their natural resources with varying degrees of success (Schreckenber, Luttrell, & Moss, 2006; German (Eds) et al., 2010). In Ghana, according to Teye (2011), the 1994 Forest and Wildlife policy clearly emphasizes the rights of local communities to have access to forest resources. This resulted in Ghana being praised by international organisations for its commitment to decentralization that enabled the Forestry Commission of Ghana to receive huge financial and technical support from international donor organisations for its participatory programme (Teye, 2011).

Though the decentralization process was well intentioned in Uganda, it failed to facilitate participation because the conditions for effective participation had not been put in place, with government officers describing the decentralization reform as a process of learning and experimenting (Bazaara, 2003; Warui, 2017). This was because implementation failed to recognize that decentralization is a process that relocates power and resources from officials at the centre to others at the periphery and requires institutionalization and time to stabilize and does not have to be rushed.

The Uganda forest sector underwent reform from 1999 (Jagger, 2010, as cited in German et al., 2010). A major outcome of the reform was the abolition of the

centralized Forestry Department and the creation of the decentralized District Forestry Service (DFS) and the for-profit parastatal National Forestry Authority (NFA) with 70% of Uganda's forests being managed by the decentralized local government (Jagger, 2010, as cited in German et al., eds. 2010). The Forest Inspection Department was created to be based at the ministry headquarters and be responsible for policy and regulation in the forest sector overseeing the activities of NFA and DFS (Jagger, 2010). The DFS had limited capacity in business development and facilitating tree planting while the NFA had the budgetary and human resources capacity to implement its mandate.

The Tanzanian government has promoted PFM as a major strategy for devolving the management of natural forests for sustainable use and conservation (Blomley, Ramadhani, Mkwizu, Böhringer, 2010). This was supported by legal and policy reforms with one of the policy objectives being to bring the large areas of unreserved (and poorly protected) forest land under a defined management regime, implemented by local authorities at village level. The communities manage the forests through the village councils which are corporate bodies answerable and accountable to village assemblies composed by adults living in a given village.

In Mali and Senegal, forests are valued primarily for subsistence and wood fuel. Control over commercial production of wood fuel, the product that creates significant levels of revenues and profits, remains in the hands of the Forest Service of the two countries (Diaw, 2010; Kassibo, 2010). The Malian government with strong support from development partners undertook a thorough revision of legislation on forest resource management aimed at delegating powers and resources for forest resource management to decentralized elected authorities or local communities (Kassibo, 2010). The communities had democratically elected representatives in turn

accountable to their constituents. The new legislation made villages responsible for commercial exploitation of village forests by creating nearly 300 rural fuel wood markets around the country (Kassibo, 2010).

Begun in the mid-1990s, Cameroon's decentralization process has transferred to local communities' legal rights and authority to acquire and manage part of the country's forests and forest revenues accruing from their exploitations to local communities (Oyono, 2005). Further, in Cameroon, a community is entrusted with a forest located near a given village with customary rights to it through a management agreement signed between the village and the administration in charge of forests (Oyono, 2005). By contract, the administration entrusts a piece of forest from the national domain, with a maximum area of 5,000 hectares, for its management, conservation and exploitation for the interest of the community. The forestry taxes are shared as 50% State, 40% to the rural council in whose jurisdiction the exploited forest is located and 10% to the neighbouring village communities (Oyono, 2005).

Decentralization initiatives to sub-national units or local resource users in Africa are currently on-going in several countries (Ribot, 2003; MEWNR, 2015). But, as illustrated by the examples above, the processes are very diverse, making learning between countries difficult. However, the process in all the countries has shown inadequacy in addressing the power dynamics between various stakeholders within the government and between government and other stakeholders, local dynamics and by ignoring local social dynamics and land tenure at council and community levels, this law induced a savage resistance from actors whose former privileges were threatened (Kassibo, 2010). Oyono (2005) outlines five types of outcome expected from decentralization processes, namely: social outcomes (justice and equity), economic outcomes (wealth and human wellbeing), political outcomes (local

democracy), ecological outcomes (natural resources sustainability), and policy outcomes (relevant lessons from field initiatives).

An important factor in successful decentralization is proper consideration of the power relations between stakeholders (Kassibo, 2010). Failure to do so, as in the case of Mali, can create resistance from some stakeholders, especially those supposed to cede power and authority, with potential for de-motivating local officers and communities resulting in exacerbated behaviours such as corruption, illegal logging, identity-based withdraws and mismanagement of forest resources (Kassibo, 2010). The decentralization process is also beset by inadequately elaborated legislation, inadequate data and research to guide the development of long-term strategy as observed by Capistrano (2010). It is adversely affected by the other sectors which are also decentralizing and more seriously as natural resources is a low priority activity for households and governments as noted by Ribot (2004). Further, the process is increasingly influenced by increased political influence and international actors.

Most forest services across Africa were only transferring non-commercially valuable user rights while retaining central control over lucrative aspects of the sector except Tanzania, Gambia and Cameroon which had more complete transfer of rights (Ribot, 2003). In Ghana, despite claims that it has adopted forest management decentralization policy, actual forest management powers and rights over forest resources are still retained by the central government and it is only interested in using decentralization policy to reduce expenditure and extend its control over forest resources (Teye, 2011).

These arrangements do not alter ownership and can be revoked anytime without compensation, which has been referred to as the right to extinguish (White & Martin, 2002; RRI, 2012). This supports Ribot (2004) who stated that decentralization

initiatives have not enjoyed great success, largely for two reasons: despite their rhetoric central governments have often not really wanted to devolve any real power to the local level; and, when significant authority has been devolved, a disproportionate share of the benefits has been captured by local elites. Furthermore, the policy-making process is facing challenges because though the policy formulation approach is multi-sectoral, its implementation is often centralized, with only uni-sector devolved structures provided for implementation (Yatich et al., 2007).

According to Agrawal and Ribot (1999), local governments should have power to make and enforce decisions and rules while locally empowered actors should be downwardly accountable to their constituents for decentralization to be effective. The decentralized process is further weakened by the absence of a unit dealing with decentralization in most countries. In Mali, there is the Mission of Decentralization (in the Prime Minister's office) which determines the territorial extent of the forested domain of the local governments (Agrawal & Ribot, 1999). As observed by Lawrence and Watkins (2012), successful natural resource decentralization requires strengthening local-level natural resource institutions with increased fiscal flow, enforcement, monitoring and judicial powers. This is possible through a reliable partnership between local-level resource user and central government.

2.5 Decentralization in Kenya

Developing countries like Kenya are undertaking “decentralization to escape from the traps of ineffective and inefficient governance, macroeconomic instability and inadequate economic growth (Ebel & Yilmaz, 2001, cited in Sharma, 2005). Decentralization is not new to Kenya, at independence, there was a devolved form of decentralization through *Majimbo* which gave significant responsibilities to regions (Chitere & Ireri, 2008; Khaunya, et al., 2015; Warui, 2017; Bulut & Abdow, 2018).

Further, Sessional paper No 10 of 1965 (GoK, 1965) stated planning was to be extended to towns and cities, to districts and rural areas. The major decentralization attempts have oscillated between deconcentration, delegation and privatization and the initiatives have included: the local government system through local authorities; the regional (Majimbo) system; the District Focus for Rural Development (DFRD) and decentralized financing like CDF, Women and *Uwezo* Funds (Omolo, 2010; Wachira, 2010).

The decentralization process in the forestry sector can be traced back to Sessional Paper No 10 of 1965 which stated that the conservation of water supplies and productive land through the maintenance of forests and windbreaks, proper methods of land cultivation and prevention of fire and flood must be actively promoted by Government and the people must be fully informed and their cooperation ensured (GoK, 1965). Subsequent amendments to the 1963 Constitution reversed decentralization opportunities and created a unitary system of management until August 2010 when Kenya adopted a new Constitution with far-reaching provisions for democratization, including the devolution of government to 47 counties (Nyanjom, 2011; Bulut & Abdow, 2018). Devolution is now rooted (chapter 2; section 6 (2) of the Constitution of Kenya, 2010) in the supreme law of the land and stands a better chance of being institutionalized. The Constitution provides for devolved governance and decision-making to ensure that communities have a greater say in how they and their resources are governed (Institute of Economic Affairs et al., 2011).

Further, the Constitution of Kenya, 2010 in article 42 gives every person the right to a clean and healthy environment further obligating the State and the community to work to ensure this is achieved and devolution offers the most feasible mechanism.

Additionally, section 174 recognizes the right of communities to manage their own affairs and further their development (GoK, 2010a). The Constitution in article 69 obligates the State to ensure equitable sharing of benefits accruing from sustainable exploitation, utilisation, management and conservation of the environment and natural resources. The Constitution further encourages public participation in the management, protection and conservation of the environment further entrenching the right of the communities to participate in forest management.

Additionally, The Forests Act, 2005 (GoK, 2005a) was revised to align to the Constitution 2010 (GoK, 2010a) to The Forest Conservation and Management Act, 2016 (GoK, 2016a), provided for the development of management plans that are implemented through signing of management agreements between the communities and KFS (GoK, 2016a). The Act provides explicit opportunities, key among them the establishment of a community management infrastructure composed of CFAs, Conservancy, County, station and national-level structures, similar to that described for Cameroon by Oyono (2004). The Act further provides for an explicit process for formation of CFAs and their engagement process with KFS as expounded in various pieces of legislation (GoK, 2009c; GoK, 2009d; KFS, 2015a; KFS 2015b).

2.6 Decentralizing Governance of Forestry Management in Kenya

Post-colonial development and natural resource management in East Africa is heavily influenced by international aid agencies, such as the World Bank (Stein, 2008, as cited in Lawrence & Watkins, 2012). Decentralization was aimed to cede power to local level officials and resource users.

Kenya's history reveals that the country has for the better part of its independent life been a unitary State with a highly centralized government that has had an overbearing control over the sub-national governments and the other arms of the government

(Omolo, 2010; Bulut & Abdow, 2018). The country has not had any real experience with devolution (Bulut & Abdow, 2018) for two reasons. First, the introduction of regionalism, popularly known as *majimboism*; in 1963 under The Kenya Independent Constitution, did not last long. The Constitution was amended in 1964, effectively scrapping the regional government and replacing them with the central government-controlled provincial administration. Second, the Local Government Act cap 265 of the Laws of Kenya was not granted significant political, administrative and fiscal powers with the central government retaining control of the local government through the administration officers hired by the central government (Omolo, 2010).

In Kenya, centralized forest management failures were widely acknowledged especially in the 1980s (MENR, 1994). The main causes for the failure included: vast sizes of some of the forests, inadequate management resources (financial and administrative – human and physical), insufficient technological and enforcement capacity, corruption, interference with local institutions managing forests, management decisions which favoured commercial utilization, inadequate information about the forests and failure to appreciate the opportunity offered by partnerships with communities and other stakeholders (MENR, 1994).

Decentralization in the forestry sector in Kenya started from late 1980s and the development of the Forestry Master Plan in early 1990s provided the formal platform that gave the requisite launch pad for decentralizing forest management (MENR, 1994). This led to the formation of diverse local forest organisations including community-based organisations and NGOs. The National Forest Programme (GoK, 2016b) recognized that Kenya's governance landscape is in transition from a centralised system to devolved governance which offers lots of opportunities for all citizens to participate and get fully involved in decision-making on forest issues

including rights to forest resources and their management. Unlike in Cameroon as stated by Oyono (2004), decentralization in Kenya is not a State initiative but a result of several actors' interest and lobbying though in both cases the State has bigger say when it comes to deciding the direction decentralization would take. In Kenya and Cameroon, there are also initiatives which are as a result of bilateral cooperation and multilateral funding programmes requiring central States in developing countries to devolve their powers as a condition for continuing aid.

Decentralization in the Kenyan forestry sector was particularly intended to address resource degradation concerns and community livelihoods. The National Forest Programme (GoK, 2016b) emphasizes the importance of devolution in forestry and the contribution to rural livelihoods. However, Adams et al. (2004) indicate that there is a conflict between biodiversity conservation and improvement of forest based livelihoods. The PFM process has been slowed by low livelihood benefits the communities are accessing, lack of benefit sharing mechanisms and inadequate alternatives (GoK, 2016b). Therefore, though in Kenya, decentralization was meant to provide opportunities for local people to be managers of the resource by conferring user rights on them and providing for the creation of legislative management tools like MoUs between Government and Government departments or between Government departments and civil society organisations or even between Government, civil society and community (GoK, 2007; GoK, 2010a; KFS, 2015a), livelihood options will have to be well thought to avoid resource degradation. The needs of the FAC have to be included in the planning so as to have their support of the forests' conservation assured as was observed by Adams et al. (2004).

The concept of community management (decentralization) in forestry in Kenya is over thirty years old, noting that it has been over a century since most communities

managed the forest on their own. The first PFM pilot was started in 1997 in Arabuko Sokoke forest with the Forest Master Plan (MENR, 1994) providing the framework for community participation. Participatory Forest Management was a government-adopted forest management practice which drew on Nepal's experience of introducing Community Forestry (CF) from the late 1970s. As noted by Manandhar and Shin (2013), CF is one of the most successful strategies for managing natural resources with active participation of rural communities.

The PFM pilot in Kenya was preceded by a national outcry over resource degradation and the failure of the policies excluding people from forests (MENR, 1994; Wass, 1995; GoK, 2016c). This created a "sense of crisis" which contributed to making the government agencies more receptive (Potter, 2008). The PFM pilot was intended to test the management approach of involving communities and other stakeholders in the co-management of forests in the country. The anticipated outcome was to reduce KFS control and increase local discretionary powers, including the creation of by-laws, revenue collection, benefit sharing and formation of organisations to participate in forest management.

Decentralization of the forestry sector was anticipated to give the communities a greater sense of ownership over natural resources, thereby increasing their willingness to observe rules on sustainable natural resource management (Teye, 2011). It was also anticipated that decentralization would increase downward accountability which ensures that officers are equally accountable to the communities as they are normally accountable to the appointing authority and also ensure that they represent the interests of the local people.

The Draft National Forest Bill, 2015 (MEWNR, 2015) recognized the need for good governance in the forestry sector as it states Kenya's forest sector has experienced

poor performance in the past, and improving forest governance has been an implicit objective in forest sector reforms over the past ten years. The Forest Conservation and Management Act, 2016, introduced PFM, through the engagement of local communities, and the promotion of the private sector investment in gazetted forest reserves, accompanied by concomitant institutional and organisation change, notably the establishment of the KFS, and the formation of CFAs (GoK, 2016a).

Participatory Forest Management, as a form of decentralizing governance in forest management, emerged in Kenya in the late 1990s as a new management approach under the decentralization rubric for reasons that are similar to other parts of the world. The key drivers were: forest degradation occurring as a result of decades of overexploitation from industrial logging, failure to involve other stakeholders in forest management and communities not benefiting (GoK, 2016b).

Further, the government when developing PFM guidelines in 2007 reviewed in 2015 (KFS, 2015a) justified the need for decentralization by stating that management of forests in Kenya in the past had laid emphasis on protection through command and control system with minimal participation of other stakeholders. Consequently, communities have been alienated from the forest resources and participation in decision-making. Over time, this has created animosity between forest managers and communities neighbouring the resources. This emphasis has changed as the overall goal of The National Forest Bill, 2015 (MEWNR, 2015) is sustainable development, management, utilization and conservation of forestry resources and equitable sharing of accrued benefits for present and future generations of the people of Kenya. The policy explicitly supports utilization of forest resources by providing an opportunity for livelihood improvement and concurs with the argument by Adams et al. (2004) that conservation should not undermine community livelihoods if we expect the

communities to support conservation. This corrects an oversight in many of the early pilot projects, which did not have the aim of contributing to community livelihoods as a stated objective (Schreckenberg & Luttrell, 2009).

The previous legislation and policy had inadequate provisions for community participation in forest management but of The Draft National Forest Bill, 2015 objective d explicitly supports decentralization by stating that it would promote public-private and community participation and partnership in forest sector development (MEWNR, 2015). The policy also recognizes the principle of subsidiarity by stating that the management of forest resources will be through the decentralization and devolution of authority and responsibilities to the lowest level possible. Further, The Forest Conservation and Management Act, 2016 provides decentralization structures in section V which provides clear mechanisms for community participation.

The new approach provided an opportunity for forest management partnership in indigenous State forests where a registered CFA (Table 2.1) can apply for permission to participate in the conservation and management of State or local (community) forests through an elaborate PFM guideline process (Katila, 2008; KFS, 2009; KFS 2015a). Community participation is guided by a forest management agreement which is valid for three years. The partnership documents are developed by the community and KFS staff, often with the support of a facilitator who in most cases is an NGO.

Table 2.1: The PFM and CFA formation process guideline

PFM rocess guideline	CFA formation and registration guideline
1) Identifying the community and resources	1) Identification and initiation stage
2) Formation/strengthening of CFA and other structures	2) Scope of activities for the CFA
3) Assessing forest area and community	3) Establish CFA roles and regulations
4) Prepare and launch forest management plan	4) Organize and facilitate transparent and fair elections of CFA officials
5) Negotiate and sign forest management plan	5) Capacity building of the CFA and forest committee
6) Implementing the plan	6) Form a forest level management committee
7) Review and revise the plan on the basis of experiences	
8) Impact monitoring of PFM	

In both Kenya and Nepal, the communities control a legally defined area of forest in terms of its management and the conservation and utilization of forest products (Manandhar & Shin, 2013). In Kenya PFM, as was the case of community forestry in Nepal, the process has been found to help develop livelihoods improvement alternatives and facilitate rural development mainly in terms of user participation, community development and the utilization of forest products by the user groups and is also an essential practice for conserving biodiversity and thus protecting the natural environment (Gurung, et al., 2011; Manandhar & Shin, 2013).

In a similar way, PFM was introduced in Kenya to enhance forest management, improve livelihoods and also as a means to decentralize forest management to the local levels of the State and the community (Schreckenber & Luttrell, 2009). This management approach was being implemented in over 40 forests scattered all over the country by 2007 (Thenya, Wandago & Nahama, 2007). By 2016, KFS planning unit record showed the plans had increased to 90 approved Participatory Forest

Management Plans (PFMP) which had been operationalized by having FMA signed between KFS and CFA. An additional 58 PFMPs had been approved but the FMAs were yet to be signed. The country had 2 forests with concessional plans approved and 2 community forests with PFMPs approved by KFS and the respective County Government County Executive Committee Members responsible for forestry management. This process may be hastened with start of implementing the devolved forestry framework through Transition Implementation Plans (TIPs) which are county specific and the framework has defined the forests to be devolved to the counties and the roles of KFS and the County government (KFS, 2015c). This has been supported by the Devolved Government Act, No. 1 of 2012 (GoK, 2012) and the Constitution of Kenya, 2010. This is in line with a global trend as observed by Pulhin, Inoue and Enters (2007) that areas (not necessarily forest) under decentralized management have increased in many countries.

2.7 Factors Influencing the Outcomes of Decentralization

There is need to understand that decentralization outcomes rely on several factors as noted by Banana, Nathan, Vogt, Bahati and Gombya-Ssembajjwe (2007), including: the nature of the forests (extent, regeneration rate, location (soil types and distance to market), patchiness, and production of external environmental goods and services); level and strength of market signals for both forest products and crops grown on forest soils; and diversity of stakeholders and their values and dependence on specific extents and condition of the forest patch (those both near and distant from the forest). Further, Monditoka (2011) indicated that policy and legislation are key factors that influence decentralization outcomes. Based on Banana et al. (2007) and Monditoka, (2011), the discussion on factors that influence decentralization outcomes have been split into four; policy, legislative, organisational and ecological

2.7.1 Policy Factors

Political will remains a key factor for influencing decentralization and ensures that the process receives adequate funding and requisite resources. In Kenya, this support has been provided through various government documents (The Constitution, 2010, The Draft National Forest Bill, 2015; National Forest Programme, 2016). This implies that the requisite support required to employ staff, equip the professionals to effectively carry out their activities as well as the communities and other stakeholders (Andersson, 2006) would be availed. The government has prepared the requisite documentation to facilitate devolving government functions (GoK, 2009c; GoK, 2012; GoK, 2015a; GoK, 2015b; GoK, 2015c; GoK, 2016a) and authority to the local level (GoK, 2010a), allowing citizens to elect their representatives to manage local affairs (KFS, 2009).

2.7.2. Legislative Factors

The Forest Conservation and Management Act, 2016 has been aligned to the Kenya Constitution 2010. This has provided to Kenya Forest Service a framework for devolving further forest functions to the counties (KFS, 2015c). The institutions have created effective linkages with other sectors that affect or are affected by the forest sector but do not have appropriate and effective sharing of authority to make decisions as a requisite for effective decentralization (Monditoka, 2011). The institutions are creating their own rules, diversifying their activities and engaging with a diversity of partners in ways that were not expected as was noted by Monditoka (2011) as a way of building social capital.

Globally, the key challenge to decentralization is the central government retaining power leading to incomplete decentralization. Decentralization in Kenya faces challenges of coordination between the different layers (central government county

government and community) and ensuring that there is a clear understanding on who has the responsibility (and capacity) to do what. User groups in Nepal facing this scenario was noted by Dev et al. (2003). This is informed by fear that decentralization may not meet the objectives for establishing Protected Areas (PA) which have been viewed as the best way to protect forest resources.

This scenario facilitates the central government to limit the powers devolved to lower units (County governments, communities and county offices); not devolve commercial rights to the County units; ensures that the lower units are partly accountable, strengthens the central government and creates supervisory officials who limit the autonomy of the sale of commercial products (Agrawal & Ribot, 2000). In Ghana, the government's justification for incomplete decentralization was that the local people did not have the technical expertise to make appropriate decisions on resource management and that complete decentralization would lead to overexploitation of the resource (Teye, 2011). This scenario was observed in Uganda where the forest service was interested in transferring only those powers that increased its control over the forest, while reducing expenditure and the community forestry committees were formed mainly to reduce management expenditure (Teye, 2011).

In Kenya, decentralization may not achieve the anticipated impacts unless the community has sufficient capacity and the necessary support to enable it to utilize the full opportunities provided for in The Forest Conservation and Management Act, 2016 part V section 49(2) (GoK, 2016a). This is because the national government has overriding forest management rights over all forests in the country creating a possibility of increasing State control over forest communities and forests as was noted by Charnley and Poe (2007). This may happen in Kenya as noted by Agrawal

and Ribot (2000), where in Senegal's 1994 forestry law the right to exploit forest and forest lands in the national domain belong to the State which can exercise them directly or grant them to third parties (concessions to private firms) or local collectives (local governments).

Further, if a local government's elected rural council would like to participate in commercial forestry, it must request that the Forest Service draw up a management plan for their zone. This is a scenario where decentralization may not achieve the anticipated results due to upward accountability. The rural councils have not been given decision-making powers over the disposition of forests since they do not have the power to say no to production. This power has been reserved for the Forest Service. In Kenya, this seems to be the scenario where KFS has retained a lot of control on forest management (KFS, 2009; KFS, 2015a; KFS 2015b).

Decentralization may negatively affect the disadvantaged in Kenya as was also noted in Nepal (Dahal & Chapagain, 2008; Dev, Yadav, Springate-Baginski & Soussan, 2003; Gurung, et al., 2011), where they have indicated that the poor are still not benefiting equitably. In some cases, their livelihoods have even been adversely affected; the local elites are benefiting most because they hold powerful positions in the executive committees and can manipulate decisions in their own favour, ignoring the agenda of the poor and the marginalized. Further, local representative decision-makers rarely receive meaningful discretionary powers, this is exacerbated by local decentralization institutions not being accountable to local populations. In Kenya, the situation is not dissimilar as decision-making is decentralised to newly created user groups who may represent the most active forest users but are not accountable in the same way as elected authorities, leading to capture of the little benefits by local elite and lack of prioritisation of poor people's needs (Schreckenber & Luttrell, 2009).

Decentralization may lead to re-centralization of forest management rights as has happened in Uganda and Senegal where laws give local authorities the right to manage natural resources but these are subject to restrictive management requirements and plans imposed by the central government and environmental agencies as was noted by Ribot (2002). In Kenya, this is the case as The Forest Conservation and Management Act, 2016 requires the formation of CFAs (KFS, 2009) as well as development of a management plan (KFS, 2015a; KFS, 2015b) which is operationalized through a FMA (GoK, 2016a). The community's subsequent access to products is governed by specific regulations including Plantation Establishment and Livelihoods Improvement Scheme (PELIS) also taungya or non-resident cultivation, charcoal rules and different forest product movement permits. These prescriptive systems require an expert forestry agent's approval before local governments and communities can make decisions as to how, when, or where forests are used or commercialized (Ribot, 2002). This provides little incentive for communities to have long-term investment plans as noted by Katila (2008), the partnership arrangement in Kenya is valid for only three years, making it very insecure. Further, the partnerships lack mechanisms to compensate communities and transfer rights and do not have security.

2.7.3 Organisational Factors

Organisational arrangement for decentralization have to be well arranged to support management and decision-making as weak institutions cannot enforce regulations. The Forest Conservation and Management Act,2016 (GoK, 2016a) provides for creation of offices from the Board of Management, the organ that oversees the operations of KFS to the lowest multi-agency committee at the forest station level. These levels of organisation are composed of State, community and non-state actors.

The mode the organisations join the committees are well elaborated with some officials being elected and appointed by the requisite organisation with fixed terms.

The multi-stakeholder committees and fora created by The Forest Conservation and Management Act, 2016 facilitate spaces for citizens' participation as noted by Olum (2014). These management structures are created guided by the principle that those who will be substantially affected by decisions made by social and political institutions must be involved in the making of those decisions (Bullock et al., 1977, as cited in Olum 2014). In Kenya, The Forest Conservation and Management Act of 2016 provides for formal community organisations and CFA, composed of registered individual forest users who form user groups. The registered members elect the CFA officials who are registered with the Attorney General Chambers (GoK, 2015) after getting an introductory letter from KFS.

Capacity building would be a necessary factor as under decentralization responsibilities will be devolved to lower levels of governance whose staff in most cases are poorly qualified and or have inadequate experience, and hired on ethnic criteria, and cannot deliver successful decentralization (Olum, 2014). The central government (read KFS) should have the capacity to manage local affairs through technical and management support. Local capacity building should involve all levels of management, involve all stakeholders and should precede decentralization (Olum, 2014).

According to Ribot (2003), community-based and decentralized forms of local natural resources management often lack representation and downward accountability and/or sufficient powers. Further in Kenya, decentralization is likely to transfer decision-making power to various unaccountable local bodies, threatening local equity and the

environment as noted in Burkina Faso, Cameroon, Guinea, Malawi, Niger, The Gambia and Zimbabwe (Ribot, 2003).

In Kenya, as in Uganda, the demand for participation has led to the proliferation of committees. This multiplicity of organisations and committees may diffuse authority among too many local institutions and take powers away from democratic bodies as noted by Ribot (2002). Further, participation as conceived under typical forestry decentralization policies may not be enough to benefit forest dependent groups significantly, though it may open spaces for participation to grow into effective demands for greater access to resources and benefits (Larson et al., 2007).

According to Contreras-Hermosilla (2008), adequate decentralization has the potential to increase allocative efficiency, equity and environmental management, while partial decentralization is likely to impact negatively on stakeholder participation in forest management (Sikor, 2005). Contreras-Hermosilla (2008) stated that effective decentralization may be facilitated by lively and influential civil society which enjoys substantial independence from government. Also, pre-existing cultural and local traditions may be important but they should be based on strong and effective local decision-making especially in rural and forest areas. Both situations are prevailing in the Kenyan forestry sector. Several stakeholders are involved in the management of the forests ranging from individuals, households and communities to CBOs, NGOs and development partners who are providing funding and technical support. In Loita community forest, there are pre-existing cultural situations that have maintained the forest intact. The challenge is that despite the room created for competitive elections by The Forest Conservation and Management Act, 2016; this has been reduced by having statutory appointments of key members of very important decentralization organs which include the chairperson and the secretary (GoK, 2016a).

2.7.4 Ecological Factors

The forests conservation status, forest type and forest products determine what products the community can access from the forest and equally what the State stands to lose in the event of decentralizing to the communities or county governments. Protected areas preserve biodiversity, safeguard ecosystem health, and provide an array of ecosystem services, such as fresh drinking water, recreational places, storehouses of genetic material, and reservoirs of wild plants and animals that can contribute to species populations in surrounding areas (Hockings, 2003). There is need to decentralize as it seems to ensure sustainable use of resource and contribute to improved livelihoods as opined by Oldekop, Holmes, Harris and Evans (2015) that protected areas which adopt co-management regimes and empower local people are more likely to report positive conservation outcomes as well as better livelihood outcomes.

2.8 Knowledge and Literature Gaps

There is information on decentralization in many sectors in Kenya with several reviews that have led to modification or abandonment of the decentralization approach. Bagaka (2008) provides a good review on Constituency Development Fund (CDF). There exists a gap in the forestry sector because, although the sector has undergone decentralization, its performance on conservation and community livelihoods has not been fully assessed. This is important as according to Hockings (2003) protected area managers and policy-makers need information on the strengths and weaknesses in their management and the threats and stresses that they face and since decentralization was introduced to improve management through participatory planning, priority setting and setting up mechanisms for accountability, good governance and reporting would provide the necessary solutions.

Though the government has started devolving forestry functions to Counties (KFS, 2015c), the mode of how these will be done has not been developed and the detailed process needs to be developed. The National Forest Programme (GoK, 2016b), indicates that the Kenya governance landscape is undergoing a transition which offers enormous opportunities. However, frameworks for harnessing the decentralization opportunities are yet to be developed. This study provides information on how implementation of the three governance types could be enhanced for better forest management and improved community livelihoods. The study on Loita forest governance system would provide information on how community management is contributing to community livelihoods and better forest management.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter is divided into six sections with section 3.1 providing general outline of the chapter. Section 3.2 provides information on the three study areas: Loita Community Forest; Kakamega Forest National Reserve and Kakamega Forest Reserve (KFR PFM regime); justification for their selection, their location and physical features; vegetation and biodiversity status, level of degradation and the existing governance system. Section 3.3 discusses the research design with sections 3.4 and 3.5 discussing sample size and sampling procedure and data collection methods respectively. Description of the methods used in data analysis is outlined in section 3.6.

3.2 Study Area

The study was carried out in Loita community forest and Kakamega forest (Figure 3.1), both of which are protected areas but governed differently. There is no single forest ecosystem which represents all three governance types under study. This limits some conservation indicators to Kakamega forest which has PFM and Government governance types but no community regime.

These sites provided an opportunity to analyse and compare the environmental and livelihood outcomes of three different forest governance regimes: community regime (Loita community forest), government regime (Kakamega Forest National Reserve – KFNR – Buyangu section of Kakamega forest) and the PFM regime (Isecheno station of Kakamega Forest Reserve (KFR)).

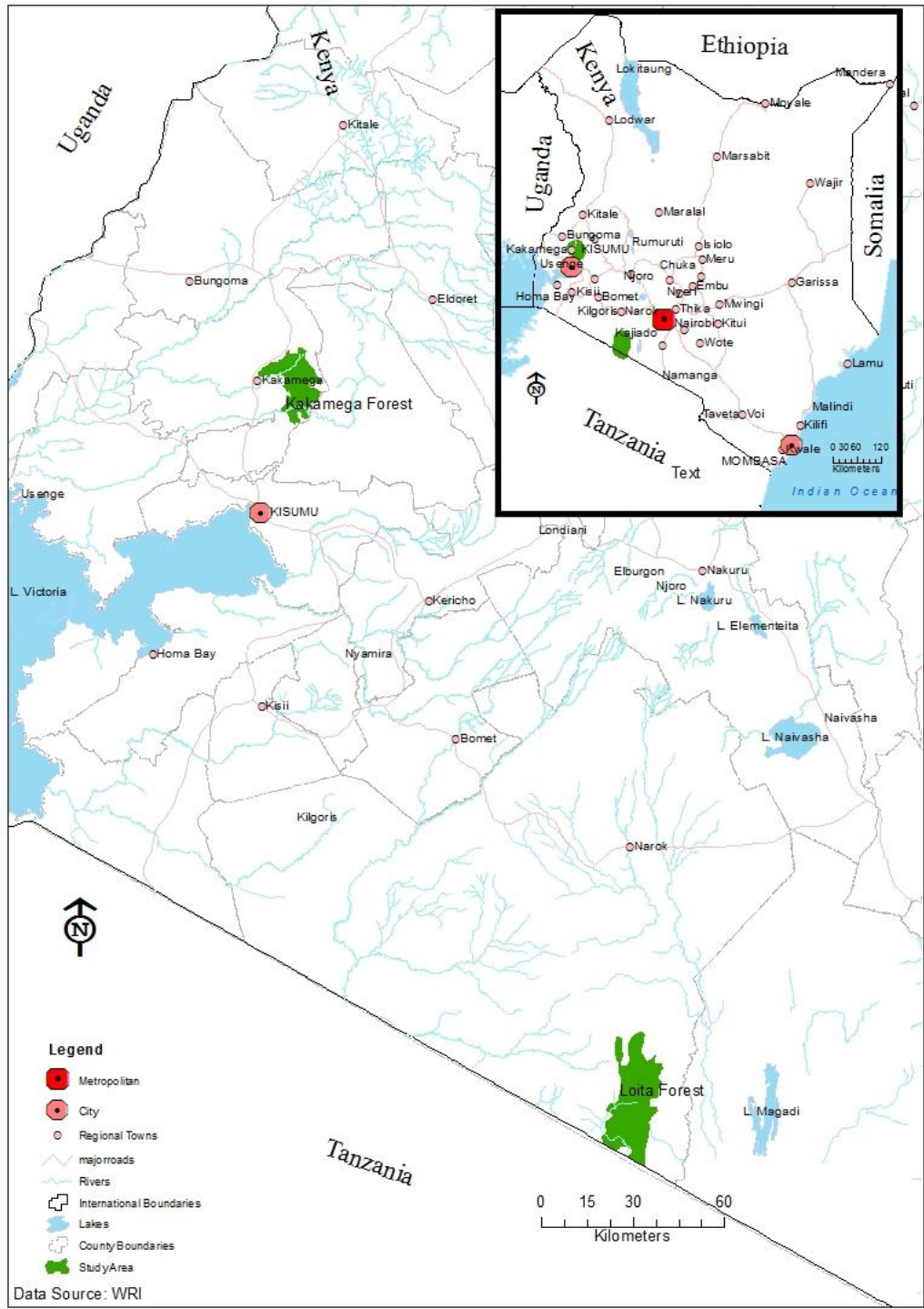


Figure 3.1: Location of the two study sites in Kenya (Data source: KFS)

3.2.1 Loita Community Forest

Loita community forest, also called *Entim e Naimina Enkiyio* Forest which means “the forest of the lost child”, is located in Narok County, Loita Sub-County (Figure 3.2). The Sub-County is composed of five locations: Olmesutie, Ilkerin, Olorte, Entasikira and Morijo with the last three bordering the forest. The forest is one of the few un-gazetted Community (Trust land) indigenous forests in Kenya which is managed by the local people (Riamit, 2011). Although not formally recognized as a protected area in Kenya, the forest fits into protected area category VI in the IUCN category of protected areas as it is a protected area with sustainable use of natural resources (Borrini-Feyerabend, 2013). The forest is managed under IUCN’s governance type D where the management authority and responsibility rest with indigenous peoples and or local community through various forms of customary or legal, formal or informal, institutions and rules (Borrini-Feyerabend, 2013).

The forest is estimated to cover an area of 33,000 hectares and is surrounded by communities with those living inside the forest increasing. The forest has been divided into three blocks “owned” and managed by each adjacent locations of Morijo, Entasikira and Olorte. The community are mainly pastoralists but fast shifting to a more sedentary lifestyle and taking up crop farming targeting maize and beans. In 1999, human impacts were limited in Loita community forest and confined to settled zones (Kiyiapi, 1999), but by 2013, the impact were evident in the whole forest as there were more settlements, tourist camp sites, grazing in the forest which was occurring all year round, extensive timber splitting was evident and motorable roads criss-crossed the entire forest (Mbuvi et al., 2015).

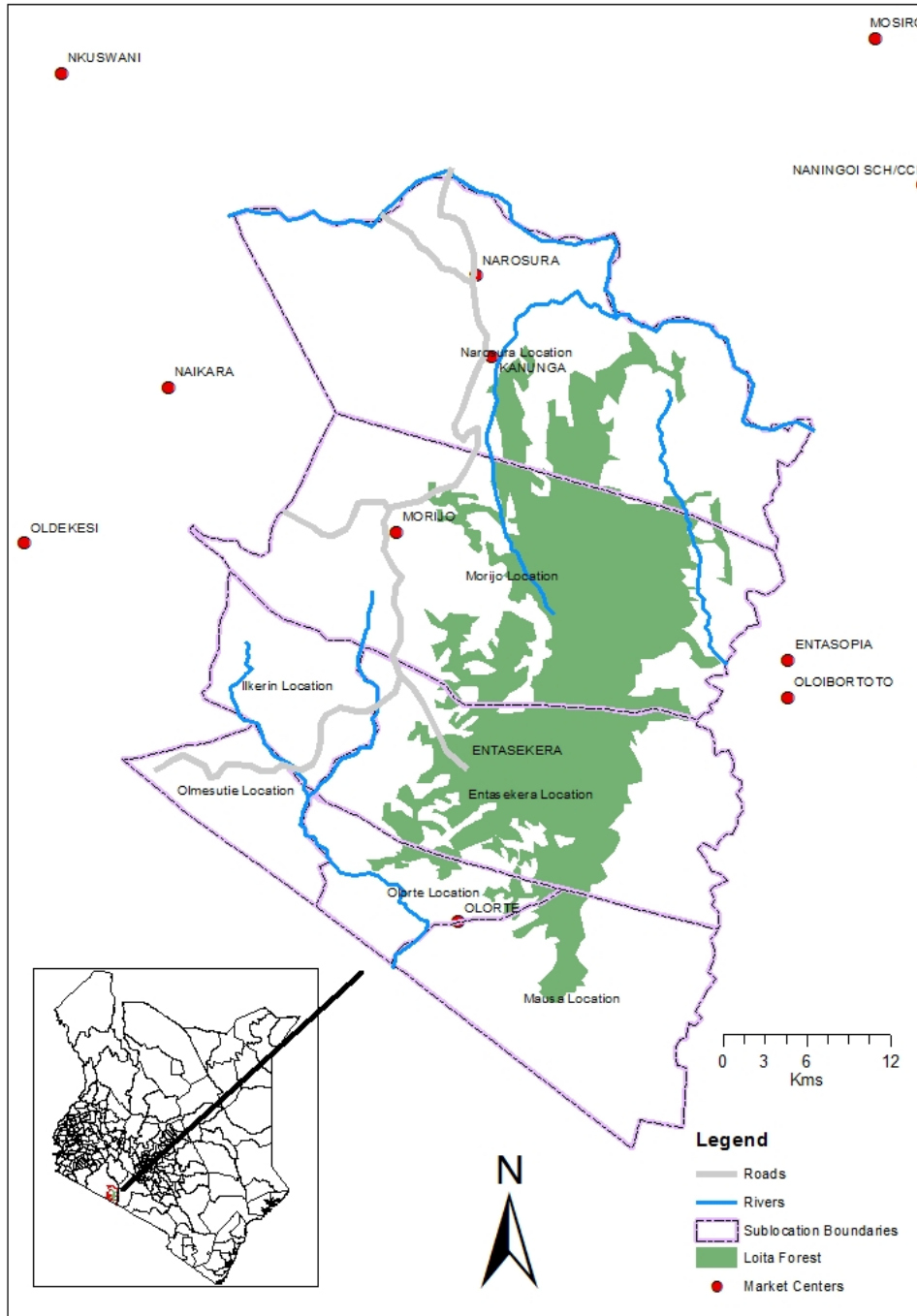


Figure 3.2: Location of Loita forest (Data source: KFS)

3.2.1.1 Loita Forest Physical Features

Loita area elevation ranges between 2,000 to 2,600 m above sea level with mean annual temperature of 17°C. The geographical position of Loita is within 1°30'S, along the Kenyan Tanzanian Border and 35°30'E to 36° East. The highlands receive

an annual mean rainfall of 1,200 mm with the lowlands getting 600 mm (Obare, 2003).

The forest can be classified physiognomically as a dry upland forest dominated by *Olea capensis* L., *Olea africana* Miller, *Podocarpus latifolius* (Thumb.) Mirb., *Podocarpus falcatus* Mirb., *Cassipourea malosana* (Bak.) Alston, *Zanthoxylum usambarensis* (Engl.) Kokwaro, *Diospyros abyssinica* (Hiern) F. White, *Teclea nobilis* Del., *Warburgia ugandensis* Sprague and *Juniperus procera* Endl. tree species (Loita Forest Integrated Conservation and Management Project, 1999). Dispersed within the extensive closed forests are bushes, glades and wetland areas (Loita Forest Integrated Conservation and Management Project, 1999). The dominant tree species change with altitude, soil type, drainage and humidity (Maundu et al., 2001). The forest can be classified into three broad vegetation zones based on dominant tree species; the Afromontane dry conifer zone dominated by African pencil tree (*Juniperus procera*) usually on hill tops; mid upland semi-deciduous forests and mixed species low upland forests (Maundu et al., 2001).

There is limited biodiversity information about the forest but owing to its considerable diversity of habitats, the forest is likely to have high species diversity (Kiyiapi, 1999). Ninety-three bird species have been reported in Loita forest including the Grey-crested Helmet shrike that is threatened and has a restricted range, the only Kenyan site for Brown-capped Apalis and one of the very few for Magpie Shrike (Loita Forest Integrated Conservation and Management Project, 1999). The forest supports globally threatened species such as the Red-throated Tit, the Jackson's Widowbird and the Hunter's Cisticola (Loita Forest Integrated Conservation and Management Project, 1999).

3.2.1.2 *The Loita Community “Loitans”*

The Loita Maasai (the Iloital or Loitans) lead a more traditional lifestyle than other Maasai groups in Kenya. The population is about 25,000 people who, due to geographical remoteness, difficult road access and poor communication, have remained isolated from other Maasai and from many of the social ills afflicting those living near the big towns (Saitabau, 2008). The Loitans entirely depend on their surroundings for survival with livestock, especially cattle and sheep, being the main economic base (Saitabau, 2008). The pressure from resource exploitation for economic gain would have a significant impact on Loita forest status.

The Loita Maasai have always assumed that they had security of tenure both in terms of ownership and management of their forest which they have responsibly managed from time immemorial (Karanja, Tessema & Barrow, 2002). This has been done through community taboos, norms and regulations on forest management that range from those regulating access to specific sites, tree species and their use, type of forest product (honey, pasture, timber, wood fuel, fruits and medicinal plants), mode of harvesting, post-harvest management and category of users, among others. These sanctions and taboos are learnt early in life and passed through generations (Riamit, 2011). The forest management and governance are implemented through a community management structure referred to as the Oloibon institution, which is, however, weakening through rural development and emerging social and political structures (Mbuvi et al., 2015). The Loibon is the highest community administrative organ (Mbuvi et al., 2015) and the whole community chooses the holder of the institution through representation by the elders.

The community resisted attempts by Narok County Council (presently The County Government of Narok) in 1993 to convert the forest into a reserve as this would have

extinguished all the rights (RRI, 2012), interests and benefits the Loita community have under customary law (Riamit, 2011). This resistance could be attributed to the fact that the Loitans are observed to be people with an independent way of thinking, faithful to their kinsmen and happy to retain their traditional way of life – traits they probably acquired in defence of their shrinking land and small population (Saitabau, 2008).

3.2.1.3 Forest Management and Governance Profile

Loita forest presents the extreme case of full decentralization as the community “own” (*de facto*) and manage the resource and the government has no role whatsoever as the community exercises the full expanded bundle of rights (RRI, 2012). However, the forest management is unusual in that it has always been community-managed and never been through a centralization process. The legal status of the Loita territory is ‘Trust Land’ (changed to ‘Community Land’) (GoK, 2010a; GoK, 2013; GoK, 2016a), which means the land is held in trust by the County Government for local residents (Garcia, 2015). The Loita territory is unique in Kenya as being the only Maasai area that has not been subjected to official tenure reform (Garcia, 2015).

The tenorial regime means that the Loita Maasai have all the rights to the forest, reflecting their belief that they have since time immemorial, responsibly managed the forest as whole and have religiously conserved and preserved it through their traditions, culture and unwritten customary laws supported by their cultural solidarity and awareness (Saitabau, 2008; Riamit, 2011). Though the Loita community has resisted adjudicating their land into group ranches for practical reasons (Karbolo, 2000; Karanja et al., 2002), the area of Loita Sub-County, has been declared an adjudication area including the forest. At the time of the last field work (July 2016), land subdivision had been suspended by a court injunction from community members

who were opposed to creation of a group ranch around Entasikira by a few elite from the community. The forest remains under community management and KFS has no role in its management.

There are three forest committees (in Morijo, Olorte and Entasikira) consisting of volunteers elected by their communities. These committees act as the implementing bodies for the Council of Elders. Each committee also has observers who may include government and NGO staff. The main task of the committees is to provide permits for people who need to cut trees for their own use (e.g. for construction or fencing) and to monitor that only the specified trees are cut. They are also supposed to prevent charcoal burning, prevent tree-cutting near water courses and encourage people to use only dry wood for firewood as indicated by Key Informants.

3.2.2 Kakamega Forest

Kakamega forest is located in Kakamega County with an estimated population of 2,078,327 people in 2018 with an average population density of 682 people/km² (County Government of Kakamega, 2017). Kakamega forest is located in Kakamega County, in Kenya. It is the only remaining equatorial rain forest in Kenya that was gazetted as trust land forest in 1933 (Kenea, 2008). The forest lies between longitude 34°20' and 35° E and latitudes 0° and 1° N of the equator at an altitude of 1,550 to 1,650 m above sea level (Figure 3.3). It is located on undulating terrain, with steep hills; Buyangu and Lirhanda which rise several hundred metres above the forest (Guthiga, 2007). The forest is composed of national forest reserve under KWS management and a forest reserve under KFS. Within the forest reserve, there are two nature reserves, these are zones in a forest where utilization is not allowed and were created to provide an overview of the natural forest ecology (KFS & KWS, 2012).

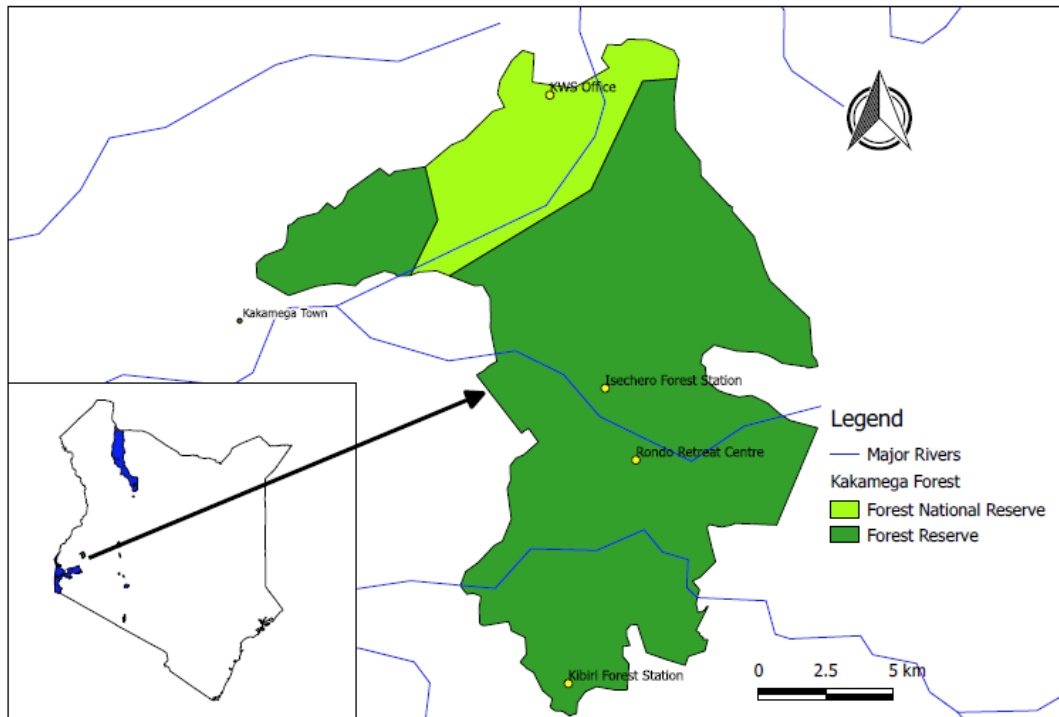


Figure 3.3: Location of Kakamega forest (Data source: International Livestock Research Institute (ILRI) Mapped by Ngugi Kigomo-KEFRI)

The County has an altitude ranging from 1,250 to 2,000 m above sea level (County Government of Kakamega, 2017). The average annual rainfall is 2000 mm (KFS & KWS, 2012). The rainfall pattern is bimodal; the long rains fall from March to June with the peak in May and short rains occur from July to September with a peak in August. The temperature ranges from 26 to 32° C with a mean annual value of 25.6° C (KFS & KWS, 2012). The farmers are involved in subsistence farming with a bi-annual cultivation of a maize-bean intercrop. Farmers also invest in production of commercial crops for cash revenues (Schaab, Kyayota, Eilu & Wagele, 2010).

3.2.2.1 Kakamega Forest Biodiversity

The forest is composed of indigenous forest cover and plantations of Pine, Eucalyptus and Cypress (Kenea, 2008). Though the forest is one of the richest biodiversity spots in Kenya, the biodiversity is under serious threat with forest cover having reduced by

at least 52% since 1933 (BIOTA East Africa, 2004, as cited in Kenea, 2008). The forest is famous for its diversity of unique and numerous flora and fauna (Guthiga, 2007). The forest is an Important Bird Conservation Area (IBA) in the country hosting about 330 bird species (a number of which are endemic) (County Government of Kakamega, 2017). It is also home to several species of monkeys (red-tailed, blue, de Brazza's and black-and-white colobus), antelopes (Duiker and Bushbuck), snakes (forest cobra (*Naja melanoleuca*), Gabon viper (*Bitis gabonica*), Rhinoceros-horned viper (*Bitis nasicornis*), about 400 species of butterflies and several moth species.

Furthermore, the forest has over 390 species of vascular plants besides other plant species (Guthiga, 2007; County Government of Kakamega, 2017). The rich biodiversity makes Kakamega forest an important global conservation area and in 1995, IUCN ranked the forest as the third highest priority for conservation among Kenyan forests (KFS & KWS, 2012). The forest has two types of grasslands: natural glades, which have existed for a long period of time and whose origin is not certain, and clearings which have resulted following a more recent human disturbance. These disturbed sites are colonized by pioneer species of *Psidium guajava* L., *Acanthus pubescens* (Oliv.) Engl., *Harungana madagascariensis* Lam. Ex Poir., *Bersama abyssinica* Fres., *Prunus africana* (Hook.f.) Kalkm., *Olea capensis* L. and *Celtis africana* Burm.f. (Guthiga, 2007). In addition to these grasslands, the vegetation of Kakamega forest also contains a mosaic of primary rainforest, secondary forest of different successional stages, swamps and riverine forest, selectively logged forest, and plantations of indigenous and exotic tree species (Tattersfield et al., 2001, as cited in Dalitz, Dalitz, Musila & Masinde, 2011).

The indigenous plantations include tree species of *Prunus africana* (Hook.f.) Kalkm. and *Maesopsis eminii* Engl., while exotic plantations contain species of

Eucalyptus spp, *Bischofia javanica* Blume, *Pinus patula* Schlttdl. & Cham. and *Psidium guajava* L. The forest also encompasses plantations of mixed indigenous species that were planted around 1934 (Mitchell, Schaab & Wagele, 2009; Dalitz et al., 2011). The originally abundant and dominating trees in the forest, *Olea capensis* L., *Diospyros abyssinica* (Hiern) F. White and *Prunus Africana* Hook.f.) Kalkmare the characteristic primary forest species of this forest (Althof, 2005, as cited in Mitchell et al., 2009). In the government regime - KFNR (Buyangu), *Psidium guajava*, introduced via workers in the gold mines and saw mills in the 1930s and 1940s has become the dominant tree species (Lung & Schaab, 2006, as cited in Mitchell et al., 2009).

3.4.2.2 History of Kakamega Forest Management

The forest was first gazetted as Trust Land Forest under proclamation No. 14 in 1933 and has since been managed by KFS (Bleher, Uster & Bergsdorf, 2006). It was declared a central forest in 1964. Isecheno, Kisere and Yala forest reserves were created in 1967 while in 1985, the northern part of Kakamega forest called Buyangu was declared a forest national reserve and gazetted as Kakamega Forest National Reserve (KFNR) and put under the management of KWS (Bleher et al., 2006).

The first demarcation of the forest boundary was carried out around 1908-1910, when the forest was managed under the Local Native Council (KFS & KWS, 2012). The original 1933 Proclamation No. 14 of 13th February set aside 23,777.3 ha as Kakamega Forest (KFS & KWS, 2012). The area currently under KFS is about 19,792.4 ha while the KFNR under KWS management is about 4,400 ha. The reduction in forest extent (quality) has been due to illegal activities such as logging and charcoal production as well as pressure from the surrounding communities who depend on it for their livelihoods (BIOTA East Africa, 2004, as cited in Kenea, 2008;

Muller, 2007, as cited in Maithya, Wuenscher & Pahl-Wostl, 2009; KFS & KWS, 2012).

3.2.2.3 Kakamega Forest Degradation History

The forest is located in one of the most densely populated areas in Kenya, with human population surrounding the forest increasing from about 390 people/km² in 1918 to about 713 people/km² in 1991 (BIOTA East Africa, 2004, as cited in Kenea, 2008). It has experienced dramatic loss in forest cover since its gazettement in 1933 (Kenea, 2008). Kakamega forest lost about 8% of the forest cover (1,960 ha) between 1972 and 1976 (Mitchell, 2004, as cited in Kenea (2008), due to commercial forest operations, farmland expansion, over exploitation by local communities, gold prospecting and later declarations and excisions.

The Kakamega Forest has experienced a long history of logging, fragmentation and other anthropogenic disturbances, including; livestock grazing, firewood collection, and selective logging of valuable tree species. Currently, it consists of secondary forest and a mosaic of differently degraded forest blocks (Dalitz et al., 2011; KWS & KFS, 2012). Present and past anthropogenic disturbance affected the structure and composition of the present vegetation, and most of Kakamega forest is a middle-aged forest with some parts having young successional vegetation (Althof, 2005, as cited in Dalitz et al., 2011). For instance, much of the government regime forest area (Buyangu) is characterized by very young secondary forest (Mitchell et al., 2009). Kakamega Forest is generally highly degraded and fragmented and the compositions of the plant communities have been greatly influenced by past commercial logging activities and other anthropogenic disturbances (Mitchell et al., 2009) including poverty. Studies by welfare monitoring surveys of 1994 and 1997 in Kakamega

indicated poverty level in the County has been rising by 52% and 58% respectively of the total population lived below poverty level (GoK, 2005b).

3.2.2.4 Kakamega Forest Governance Profile

Kakamega Forest has two management regimes being applied: full Government control and joint forest management through PFM between government and community. Kenea (2008) indicated that the forest has undergone four main management phases. The earliest phase was when the forest was under local community management. This was followed by government-led management in 1931 where forest was placed under KFS (then Forest Department) management. The third phase was from 1959 and 1964 where the local people had access to some forest resources. This could be attributed to weakening management due to clamour for independence and systems not functioning well after attaining self-governance in 1963. The fourth stage started with the declaration of the forest as a central government forest in 1964. A fifth phase is now evident since The Forest Conservation and Management Act, 2016, which allowed for the start of community participation in forest management in form of PFM implementation (KFS, 2015a).

3.2.2.5 Kakamega Forest National Reserve (Government Regime - KFNR)

Kakamega Forest National Reserve is located in the northern part of the forest, also known as Buyangu area. The area is under KWS management and the community are strictly excluded from it. They cannot extract any products from the forest and unauthorized entry into the forest is not allowed and may result in arrest, prosecution and punishment. The government regime study site represents an area under strict centralized government management. This is protected area category II in the IUCN category of protected areas as it is protected as a national park-ecosystem protection of cultural value (Borrini-Feyerabend, 2013). This forest is managed under

governance type A where one or more government bodies hold the authority, responsibility and accountability for managing the protected area, determine its conservation objectives to develop and enforce its management plan (Borrini-Feyerabend, 2013).

This conservation strategy has been dominated by attempts to fence off or reserve area for nature and exclude people from reserved areas as they are viewed as being in direct conflict with the objectives of biodiversity conservation (Guthiga, 2007). This management approach is meant to ensure the biodiversity is preserved in its natural state. The forest area under the management of KWS consists of the sections of the forest least disturbed by local communities (Schaab et al., 2010). Kenya Wildlife Service carries out its operations with limited involvement of the forest adjacent community with all the income that arise from the reserve accruing to the State with little benefit if any at all going to the local communities (Guthiga, 2007).

3.2.2.6 Kakamega Forest Reserve (KFR) – Isecheno Forest Station

Kakamega Forest Reserve is formally managed by KFS but community and other stakeholders participate in its management. This is protected area category VI in the IUCN categorization of protected areas as it is a protected area with sustainable use of natural resources (Borrini-Feyerabend, 2013). The forest is under governance type B where the protected area is under shared governance formally and or informally with authority and responsibility shared among several actors (Borrini-Feyerabend, 2013). The KFS maintains an overall management authority and ownership but it is a case where decentralization provides space for all (Kariuki 2008; KFS & KWS, 2012). In practice, KFR is being managed under the premise that Forest FAC are partners in biodiversity conservation, who should be allowed access to the resource and there should be clear links between conservation and community livelihood improvement.

Under this approach, the community is allowed some access rights including decision-making or right to participate in forest management (Kariuki, 2008). The area has witnessed decentralized governance practices through multiple stakeholder involvement, community participation in decision-making which has resulted in livelihood activities like butterfly and silk moth farming, eco-tourism and beekeeping through partnership in management and investment.

The forest area is managed by a Forest Manager who reports to the Ecosystem Conservator (EC). The EC reports to the Head of Conservancy (HoC) of the Western Conservancy who reports to the KFS headquarters. The day-to-day forest protection is assured by rangers with support from community scouts. The latter are answerable to the CFA committee and the forest manager. The CFA holds meetings with KFS periodically to plan on how to manage the forest jointly (KFS, 2015a). Further, the communities have access to specified forest products as defined in the PFMP (KFS, 2015b) and formalized by FMAs. The fees paid are as determined in the Forest (Fees and Charges) Rules, 2016 (GoK, 2016d) and local PFM guidelines which mostly charge additional amounts above the set forest (fees and charges) rules.

3.3 Research Design

The study used descriptive research design in order to meet all the research objectives. Social science methods included review of policy and project documents, household surveys, focus group discussion and questionnaires administered to key informants and participant observation. Natural science methods included analysis of remote sensing data and forest inventories through transects.

3.4 Sample Size and Sampling Procedure

The estimated sample size was calculated using a formula for social science research (Kothari (2004) as $n = \frac{(z^2 \cdot p \cdot q \cdot N)}{[e^2(N-1) + z^2 \cdot p \cdot q]}$. Where n =sample size, $z=1.96$ (as per area under normal curve for the confidence level of 95% as desired for the study). $P=50\%$ (sample proportion in the study population presumed to have the characteristic of interest. $N=11,224$ (Total number of households in the study sites). This was adopted as recommended by Fisher (1958) as cited by Mugenda and Mugenda (2003) where P was not available as for this study. $q=p-1=0.50$; $c=0.05$ (desired precision rate). Therefore $n = \frac{(1.96)^2 (0.050) (0.50) (11,224)}{(11,224-1) \pm (1.96)^2 (0.50) (0.50)} \approx 386$ households.

The target population in LCF was determined from 22,873 persons representing 4409 households (GoK, 2010b). Given the size and variability of the Loita study site, it was first stratified into six zones to get a fair representation of settlements inside and outside the forest and to capture a good perception of the forest conservation status and community livelihood. The stratification was guided by: (a) an ecological survey which showed that some sections of the forest were settled but there were other areas not settled and that the communities outside utilized the forest differently, and (b) local expert knowledge. A list of Manyattas in each zone was provided by the village heads. One Manyatta was randomly selected in each village and a questionnaire administered to a minimum of twenty household heads within each of the selected Manyattas. The sample population in Loita forest was 152 households, the questionnaires were administered to 180 households but 122 questionnaires were correctly filled and used for data analysis.

In the government regime, the target population was 987 households (GoK, 2010b) and the sample population was 34 households. The questionnaires were administered

to 80 households randomly selected households from Buyangu village living adjacent to the KFNR. Data cleaning confirmed 71 correctly filled questionnaires that were in analysis. At this site, the forest adjacent community was treated as a unit because as a forest national reserve, the management was uniform and the communities' interaction with the resources was minimal and legally similar.

In the PFM regime (KFR), the target population was 5828 households (GoK, 2010b) and the sample population was 200 households. The KFR site was stratified into three zones based on: distance from the station; households' interaction with donors and households informal forest access based on local expert knowledge. The sites were: **Virhembe** (PFM area, near the station and highest interaction with Donor; **Ikuywa** (in between the two sites experiencing moderate effect of all factors), and **Ileho** (the farthest with minimal donor interaction and highest informal forest access). The households were randomly selected from a sampling frame that included a list of all households living adjacent to the forest in KFR from the three villages where 175 questionnaires were administered. During data cleaning only 130 questionnaires were correctly filled and used for analysis. In addition to the 175 households sampled in the KFR, 40 additional households (20 PFM participants and 20 non-participants) were purposively selected in Virhembe Village to determine the impact of PFM on community livelihoods where household income from forest products was used as the proxy.

Policy respondents were selected from relevant government departments as well as local and international Non-governmental institutions involved in the management of forests through purposive sampling (Mugenda & Mugenda, 2003). These ensured participants with adequate knowledge were interviewed.

3.5 Data Collection Methods

3.5.1 Social Science Methods

5.5.1.1 Policy Review

Secondary data collection involved review of forest policy and project documents to provide an overview of how decentralization has been undertaken in forest management. Legislative instruments like MoUs, Management plans, FMA, Acts and other forms of legislations were reviewed with key informants through discussions in their offices and telephone conversations.

Thirty six policy-makers were selected purposively for this study on the basis of their awareness about PFM policy issues and past active involvement in PFM planning and implementation of PFM. The questionnaires (Appendix I) were administered to officers drawn from organisations (government, non-government organizations and community) involved in forest management.

The policy-maker respondents were drawn from 23% of the 47 counties represented by Mombasa, Nyandarua, Nairobi, Nakuru, Nyeri, Kilifi, Taita Taveta, Narok, Kiambu, Kakamega, and Kwale counties. These organisations included: KFS, KEFRI, KWS, local CBOs, CFAs, Nature Kenya, Forest Action Network, IUCN-Eastern and Southern Africa Office Nairobi and WWF Kenya Office. The professional representation of the policy-maker respondents included: 1 Conservation Secretary, 3 Directors, 1 Senior Deputy Director, 3 Heads of Conservancies, 6 Ecosystem Conservators, 4 Assistant Directors (3 from KFS and 1 from KEFRI), 2 Research scientists, 2 Lecturers, 6 Heads of NGOs, 3 Senior officers from the civil society and 5 CFA chairpersons.

3.5.1.2 Household survey

Household questionnaire surveys were implemented to understand how forest governance was perceived by local community members through questionnaires (Appendix II) conducted in the households. In addition in the KFR site, recall questions were used in order to attribute any observed livelihood impact at household level to PFM (Schreckenberget al., 2010). The questionnaires and ecological studies were implemented between October 2011 and October 2012 in both Loita and Kakamega forests. In addition to basic demographic questions, the questionnaire had three main sections. The first section asked about the household's livelihood activities and how these had changed over time. The second section probed on their understanding of the local forest governance system including their own involvement in decision-making.

The third section focused on forest conservation and looked into changes in conservation status of the forest over time and the impacts this was perceived to have had on the household's livelihood. Households' feeling of getting a fairer deal (good relationship with the forest) from the forest was assessed through questions on: how the forest was contributing to their livelihoods; households' access (formal and informal) to forest products; community involvement in the management and conservation of the forest; changes in access and availability of the resources in the forest; opportunities for community employment in the forest both on contract and permanent basis; ability of the community to improve their living standards based on forest resources and the contribution of the forest to both ecological and social services through water catchment and as a place to undertake cultural practices. In Loita, households living both adjacent to and inside the forest were interviewed.

The questionnaire was administered to the head of the household, either husband or wife or any other adult responsible member of the household aged 18 years and above in all regimes. If none of the above was present, an appointment was made to return to the household at a later date. Questionnaires were administered by the lead researcher and six trained enumerators who were fluent with the local language especially for those respondents who could not speak Swahili or English. The household survey respondents were from communities that have lived either inside and or adjacent to the forests with adequate interaction with the forest resources either as users and or managers.

The household survey was done in LCF herein referred to as the community regime, KFNR – Buyangu herein referred to as the government regime, and KFR – Isecheno forest station herein referred to as the PFM regime. This was to determine the impact of forest governance regime on community livelihoods and forest conservation. The community regime represented a traditional community-based forest management scenario and was stratified into six study zones (Figure 3.4) as follows:

Entasikira – This is the largest shopping centre in Loita. It is home to Loita sub-county headquarters, KWS outpost, a carpentry shop, a secondary and primary school, several churches, several shops and a hospital. It is located less than a kilometre from the western forest edge.

Olorte – This is a small farming settlement adjacent to a developing shopping centre to the south-west of the forest. It has a campsite, very active community Water Resource Users Association (WRUA), an NGO office and a private primary school and is about one kilometre from the forest edge.

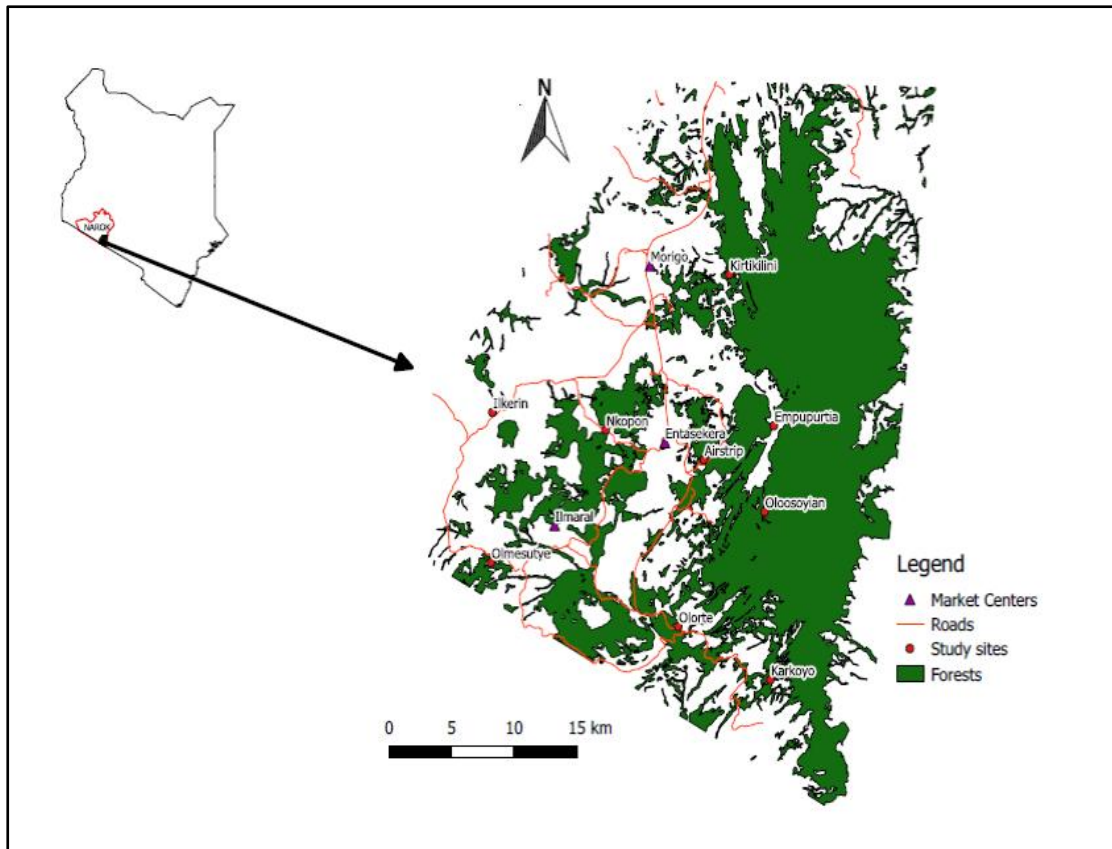


Figure 3.4: Study zones in Loita forest (Data source: KFS)

Ilkerin – This is a rural development centre located over 20 km away to the West of the forest. It has the largest shopping centre, a dispensary, a church, a livestock improvement project including offices for an NGO that has been coordinating development activities in Loita since 1972 but plans for its formation started in 1968.

Empupurtia – This is a fast growing settlement area around a swamp in the middle of the forest. It has two primary schools and churches.

Ilmaral – This is a settlement about 15 km from the forest edge (towards the west) with communities relying on the forest for grazing. The community is also involved in Maize cultivation and the area is facing land degradation.

Nkopon – This village is located about 15 km south-west of LCF. The community also practices maize growing as well as livestock keeping, the area is facing land degradation.

In Kakamega Forest, a continuous forest block, the study was done in the government regime (KFNR) and the PFM regime (KFR) areas. The forest area under the government regime was managed by KWS with no community participation representing a C&C governance regime where the State has almost exclusive right over ownership, access and use of the forest. The community has very negligible user rights.

The forest area under the PFM regime was managed by KFS through the Forest Manager who is based at Isecheno forest station. This section of the forest is jointly managed by KFS and forest adjacent communities with active participation of several community-based organisations and NGOs, both local and international. Regulated consumptive and non-consumptive utilization are allowed in this section of the forest. In the PFM regime, households surveyed were clustered in three zones:

Virhembe - These composed of villages next to the forest station and have had the most and longest interaction with KFS, external donor support and PFM has been implemented the longest. The community also has several income-generating activities (IGAs) such as; community hostels, butterfly farming, community nurseries, tour guiding, herbal products cottage industry and a snake park. Informal access to the forest was lowest of the three zones as all forest rangers were based there. It was anticipated that the households in this zone would have benefited most from forest-related activities.

Ileho - This was a village which was farthest from the forest station. It was anticipated to have been receiving the least KFS interaction and have had the least projects. Informal access of the forest was anticipated to be highest.

Ikuywa - This was a village between Virhembe and Ileho and was anticipated to have been receiving moderate KFS and project interaction. Benefits from initiatives like PFM were expected to be minimal as the process started with Virhembe communities before extending to Ikuywa.

3.5.1.3 Key Informant Interviews (KIs)

Interviews were carried out with individuals with expert knowledge on the diverse issues of the research; policy, social and forest management. A snow-balling approach (Mugenda & Mugenda, 2003) was used whereby interviewees were asked to propose further Key Informants (KIs) they considered to have relevant experience, and these were added to the sample until no new names were mentioned. Initially, fifteen KIs were held spread evenly across the three sites. In the case of Loita, semi-structured interviews were also carried out in July 2016 with 5 key informants at the county and community level to deepen understanding of the rapidly changing governance system.

3.5.1.4 Focus Group Discussion (FGD)

This is a type of in-depth interview accomplished in a group, whose meetings present characteristics defined with respect to the proposal, size, composition, and interview procedures as defined by Freitas, Oliveira, Jenkins and Popjoy (1998). Five Focus Group Discussion (FGD) of mixed sexes and age were initially held in each site (regime). The FGD had between five and ten participants (Freitas et al., 1998; Folch-Lyon & Trost 1981; Boateng, 2012) selected with help of KIs. They were carried out over the same period as the household surveys.

The discussions were guided by a checklist (Appendix III) and recorded in a notebook. The FGD were used to discuss difficult trends on; forest land cover change trends as observed by Folch-Lyon and Trost (1981), forest governance regime dynamics over time, forest canopy status (open or closed), the social and environmental impacts, the presence of key indigenous tree species, the occurrence of cut trees and how the participants perceived any changes to be attributable to the governance regime (Schreckenberget al., 2010). In 2015, two FGD were held in Kakamega and Loita to review the land use cover change trends with communities with the last FGD being held in 2016 to get a deeper understanding on the governance system in LCF. The initial FGD provided criteria for forest condition that were used to populate the household questionnaire and also to provide the context of explanation for some of the household survey results.

3.5.1.5 Participant observation

Observations were made in all study sites to capture physical capital outcomes of the forest governance regime like offices for community organisations and livelihood improvement activities like woodlots, tourism facilities, tree nurseries and beehives. This approach was driven by “logic of discovery” (Jorgensen, 1989) to find out how the communities relate with the forest. In participant observation, the researcher observed and made records written and photos. These were done in the forest supported by discussions with communities. Photos of large trees in the forest were taken and changes discussed with herders and farmers in the forest. This was useful in discussing forest change data This was appropriate in forest especially Loita because the community (insiders) were of the opinion that the forest was not degraded while the researcher (outsider) was that the forest was being degraded (Jorgensen, 1989).

3.5.2 Natural Science Methods

3.5.2.1 Ecological Sampling for Forest Resource Assessment

Assessing the impact of the forest governance regime on conservation was done through belt transects of 100x20 m. In the case of Kakamega forest, the transects were established in both primary and secondary forests running from the edge of the forest towards the interior. Existing forest maps were used in the identification of primary and secondary forest blocks. The KFR was divided into five zones. Isecheno zone was sub zoned into Primary (P) and Secondary (S) forests. The zones included; Chelovani (P), Ikuywa (P), Ileho (P), Lirhandanda (P) and Isecheno both (P and S). For Loita, the entire forest was classified as a primary forest and transects randomly established from the edge to the interior of the forest. Transects were established randomly at each site. The number of transects and plots established in each forest site was proportional to the size of the forest site (Kindt & Coe, 2005).

In each transect, sampling plots measuring 20x20 m were systematically established at an interval of 50 m for enumeration of all tree and shrub species with a height \geq 1m. The species were identified, and diameter measurements taken at breast height (1.3 m above ground) using a diameter tape for trees with DBH \geq 2.5cm. In addition, the height of each tree and shrub was measured using a Suunto clinometer. Also, within each 20.0x20.0 m plot, three 3.0x3.0 m sub-plots were randomly nested for counting the regenerates (saplings and seedlings). The counted regenerates were identified by species. The parameters assessed included: regeneration rate, species abundance, frequency, diameter size class distribution and density. These were used to make inferences on the condition of the forests under different management regimes (Appendix IV) in Kakamega forest. It was not easy in Loita to attribute changes in forest condition because of the absence of a baseline ecological study.

3.5.2.2 Geographical Information System (GIS) - Forest Land Cover Change Assessment

This involved assessment of change of forest condition over time. The land cover classes used were thick forest, light forest, grassland and bare land (J. R. Anderson et al., 1976; Siderelis and Nagy, 1994). A percentage cover of each area was calculated for each vegetation type out of the total area. This was done for three periods of 1990, 2000 and 2012. In the government and the PFM regimes, detailed Geographical Information System (GIS) analysis was done for the entire forest. Forest change over time was assessed in terms of forest area and the quality of forest cover. This was achieved through fragmentation analysis of the GIS images over a period of 30 years, with images available for 1990, 2000 and 2012.

Changes in forest area were detected through canopy analysis and reduction of forest area and or boundary changes over time. The forest land cover change was done for the whole forest for each study site. In the PFM regime, a detailed imagery was done for a section of forest near the forest station offices (Chelovani), and in a forest area adjacent to Ileho which is far away from the forest station hence poorly policed and Ikuywa area which is in between Chelovani and Ileho and is moderately policed. In the community regime, detailed imagery analysis was done for forest areas adjacent to Entasikira which is adjacent to the largest settlement and subjected to longest human disturbance, Olorte section of the forest adjacent to a growing village practising irrigated farming and the least disturbed Korkoyo forest area where settlement has not started.

The forest condition was determined from forest extent (size – spatial) and forest quality change over time. Forest extent was determined from loss of forest area as a result of deforestation, excision or encroachment including gain of forest area from

tree planting. Forest quality was assessed through change over time of forest degradation in terms of species diversity, structure (basal area), stand density and regeneration. Ecological survey through transects were used to determine species composition changes over time (frequency, density and abundance). Current forest condition was compared with previous resource inventory reports to determine changes over time. The forest condition has a direct relationship with the management effectiveness from a governance and ecological condition perspective.

3.6 Data Analysis

3.6.1 Social Data

The policy documents and project reports were analysed thematically for the different forest governance regimes. This was done to assess how the regimes are supposed to be implemented and how they were implemented in practice. All socio-economic and biophysical data were entered in MS-Excel and Statistical Package for Social Scientists (SPSS Version 17) and General Statistics (Genstat Version 13) were used in data analysis respectively.

The household survey data were analysed using descriptive, parametric and non-parametric statistics. Specifically, descriptive statistics such as frequencies, percentages and cross tabulations, as well as chi-square tests were used to explore patterns in the data in relation to perceptions about the forest governance scenarios. Parametric statistics, namely; regression analysis and generalized linear models, were used for quantitative and qualitative data such as distance to forest, quantity of resources accessed in relation to forest governance regimes among others. A simple linear regression model was used to check the relationship between quantity of resource accessed and distance from the forest as well as other quantitative

characteristics of the household. Differences between the forest governance regimes were assessed using t-test.

3.6.2 Forest Quality Assessment Data

The changes in forest resources based on Landsat images/remote sensing were analysed using time series analysis procedure to detect forest cover change over time under different management regimes. Satellite images through land cover change fragmentation analysis using four clusters analysis provided forest condition (size and quality) trend over the last 30 years in terms of forest land cover change to determine the extent of habitat fragmentation (degradation) and loss within the forest (Chapungu et al., 2014).

In Loita forest, vegetation change and land cover analysis looked at forest land cover change around three defined zones. The zones were: Oloosoyian (A) area where settlement was starting; Korkoyo (B) area of forest which was hardly settled and farmed but heavily grazed almost throughout the year; and Olorte (C) forest area which was adjacent to a rapidly growing farming settlement practising irrigated farming. In Kakamega forest, there were five analysis done. A detailed analysis was done for four sites represented by a site in the government regime and three sites in the PFM regime. The later were represented by a site near Isecheno forest station, Ileho located far away from the station and Chelovani which is located mid way and assumed to have received less government protection than Isecheno but more protected than Ileho. The final analysis was done for the entire forest area supported by FGD to outline the major causes of the degradation status.

3.6.3 Ecological Assessment Data

The vegetation data analysis to determine the effect of the forest governance regime on forest conservation was done using parametric tests. The measure of diversity used was Shannon-Wiener diversity index (Shannon *and Wiener*, 1963; Krebs, 1999):

s

$$H = -\sum (P_i * \ln P_i)$$

$i=1$

Where,

H = Shannon Weiner diversity index

P_i = Fraction of the entire population made up of species i

S = Numbers of species encountered

For mean comparisons of the forest condition, analysis of variance (ANOVA) was used where F value demonstrated the significant differences at probability level of 95%.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter is divided into six sections with section 4.1 outlining the structure of the results and discussion section. Section 4.2 gives a detailed description of the research participants (policy-makers, household survey respondents and FGD participants) in the study sites. Policy-makers' perception on decentralized forest governance in Kenya (Research Question 1) are analysed and discussed in section 4.3. Section 4.4 presents analysis and discussions of the impacts of governance type on forest conservation (Research Question 2) while the impacts of forest governance type on household livelihoods (Research Question 3) are analysed and discussed in section 4.5. Institutional factors that support and constrain decentralization of forest governance in Kenya (Research Question 4) are analysed and discussed in section 4.6.

4.2 Characterization of Respondents (Policy-Makers and Households) and Study Sites

4.2.1 Policy-Makers

The majority (69%) of the policy-makers interviewed were over 40 years old, with 28% being above 50 years old and having over 25 years of work experience. This suggests that the respondents had adequate knowledge on forestry management and were very well-conversant with policy issues. The policy-makers interviewed had gained experience having worked in the forest sector for over twenty years. This enabled them to give an informed view of forest management in the country both as managers and policy-makers. Their experience either as civil society and public servants provided a basis for a balanced opinion.

The policy-maker respondents were predominantly male (92%) with only two female respondents (8%). Although low, this level of female respondents is a fair representation of the gender balance in the forestry sector as in 2016 data from KEFRI show that only 3 (18%) out of 17 officers (assessed from the level of scientists in charge of regional programmes to Director) were female while only 9 (14%) out of 66 KFS officers (from Ecosystem Conservators to the Director) were female. Although the gender composition of the policy-level respondents was very uneven, this reflects a general preponderance of men in the higher levels of forest sector organisations, both in government and NGOs.

4.2.2 Ethnicity of Household Respondents

There was a significant difference in ethnicity across the three management regimes in the respective sites ($\chi^2 = 315.591$, $p = 0.05$). In the community regime, the Loita Maasai was the predominant tribe at 97.5% while in the government and the PFM regimes, Luhya tribes were the predominant at 97.2% and 96.9% respectively (Table 4.1). In the community regime, there was very negligible presence of non-Maasai ethnic groups except in the main settlement of Entasikira, an indication of other ethnic groups starting to migrate into the area.

Table 4.1: Ethnicity of household head

Ethnicity/Regime	Luhya (%)	Maasai (%)	Kalenjin (%)	Luo (%)	Somali (%)	Total (N)
Community	0.8	97.5	0.8	0.0	0.8	122
Government	97.2	0.0	1.4	1.4	0.0	71
PFM	96.9	0.0	1.5	1.5	0.0	130

4.2.3 Gender of Respondents

In all the three study sites, the main gender of respondents was male but women were also represented (Table 4.2). However, the proportion of female respondents in the community regime (Loita Maasai) was slightly higher than at the other two sites. This could be attributed to the fact that Maasai women are mostly home keepers as the men go to herd livestock in the forest.

Table 4.2: Gender of respondents

Gender/Regime	Male (%)	Female (%)	Total (N)
Community	59.8	40.2	122
Government	67.6	32.4	71
PFM	66.2	33.8	130

4.2.4 Age of Respondents

There was a significant difference in age classes (Table 4.3) among the household heads in the three sites ($\chi^2 = 45.682$, $p < 0.001$). There were more youth (aged between 20 to 40 years) in the community regime compared to the government regime and the PFM regime where the largest group of the household heads were aged between 41 and 50 years.

Table 2.3: Age classes of household heads

Age(years)/Regime	Less than 20 (%)	20-30 (%)	31-40 (%)	41-50 (%)	51-60 (%)	Over 60 (%)	Total (N)
Community	3.3	37.7	20.5	18.0	14.8	5.7	122
Government	1.4	8.5	26.8	31.0	21.1	11.3	71
PFM	0.0	11.5	22.3	29.2	19.2	17.7	130

4.2.5 Household Size

There was a significant difference in mean household size ($F=3.240$, $p=0.04$) as well as mean number of adults per household ($F=4.447$, $p=0.01$) across the regimes/sites

with the community regime having the highest mean number of household members (7.16) but with the least number of adults (2.83) per household (Table 4.4). Minimal differences were observed in the mean household size and mean number of adults in the households between the government and the PFM regimes. Most household heads in Loita had two homesteads in the plains and the forest. The adults stayed in either of the homesteads depending on the seasonal grazing of livestock where the animals are moved to the forest during the dry season and the plains during the rainy season with the mothers periodically transporting food to either homesteads.

Table 4.4: Mean household size of household respondents

Regime	Mean HH size	Mean HH adults	Total (N)
Community	7.16	2.83	122
Government	6.25	3.23	71
PFM	6.17	3.62	130

The sites differed in terms of the dominant ethnic group (Maasai in the Loita site and Luhya at the two Kakamega sites). Households at the Loita site were larger with fewer adults, younger household heads and lower education levels than at the Kakamega sites.

4.2.6 Level of Respondents Education

A significant difference was observed in level of education of the respondents in the three sites ($\chi^2 = 151.487$, $p < 0.001$). The community regime stood out as having the highest level of illiteracy (almost two-thirds of household heads) with none of the respondents having achieved university education level. In the PFM regime, about half of respondents had reached primary school while nearly half of the government regime respondents had achieved secondary education (Table 4.5). Furthermore, the number of respondents with tertiary education level was highest at the government

regime site. The reasons given during FGD and KI for higher education level among household heads in the government regime were sufficient cash income from commercial sugarcane growing providing households with money to invest in education.

Table 4.5: Education status of household heads

Regime	Education level					Total (N)
	Illiterate	Primary	Secondary	Diploma	University	
Community	61.5	22.1	13.1	3.3	0.0	122
Government	2.8	28.2	47.9	12.7	8.5	71
PFM	4.6	50.8	34.6	7.7	2.3	130

4.3 Policy-Makers' Perception of the Aims of Decentralized Forest Governance

This section provides evidence on Research Question 1, which relates to how policy-makers perceive forest governance in Kenya, the decentralization and the aims and benefits of forest governance decentralization.

4.3.1 Respondents Views on Forest Governance Regimes in the Kenya's Forestry Sector

The study sites were under different management regimes; community alone, government alone and community and government managing jointly (PFM). In forest Loita, community management was considered to be the key management approach by the household respondents where 56% perceived the Council of Elders to be the managers, 17% and 6% indicating community and KFS respectively while 21% were not aware of the manager. Communities have exclusive rights to manage the resource and the right to exclude others.

The households in the government regime indicated that the government were the lead agency managing KNFR (62%); government and community were perceived by

32.4%; community by 4.2% of the household respondents while 1.4% were not sure of the lead agency. Community elders were not perceived to have any role. The management approach being applied in the government regime was C&C (93%) while a small proportion (7%) of the community felt that they were involved in forest management. Additionally, the households indicated the key management organisation that had contributed to better forest management was the government (38%). The other factors that were mentioned to have contributed to better management of forest were the community (14%), PELIS (15%), KFS (14%), joint forest management (community and Government) 7%, with 6% not being sure. The indication PELIS being done in the government regime was an indication that the households could be accessing it through those communities adjacent to KFR (PFM regime) as it is only practiced in the PFM regime. In the PFM regime, it was indicated by 63.9% of the households' respondents that decentralization was being implemented as a management regime. Over 98% of the households in the PFM regime perceived that communities were participating in forest management.

The three study sites represented the range of major forest management regimes in the country. The results should be applicable to the different forest types in Kenya based on ownership and management as classified by FAO (2010), which include 2,013,000 ha of forest area under community (trust or community land), 1,364,000 ha State forests (including parks and mangroves – government and PFM regimes) and 90,000 ha of private forests. The law also allows PFM implementation in private forests and community lands (KFS, 2015a; GoK, 2016a).

The Forests Act, 2005, revised to The Forest Conservation and Management Act, 2016 so as to be aligned to the Kenya Constitution, 2010, was cited as a major factor determining the management approach being applied by respondents in both the

government regime (64%) and the PFM regime (63%) (Figure 4.1). In the community regime, community consciousness of the forests importance was the main factor followed by the Council of Elders. The Wildlife Conservation and Management Act, 2009 (GoK, 2009a) revised in 2013 to The Wildlife Conservation and Management Act, 2013 (GoK, 2013) to align with The Constitution 2010 (GoK, 2010a) was not mentioned by any household respondents in the government regime. This may be an indication of inadequate presence and or awareness about the Wildlife Act or the law under which the forest national reserve is managed.

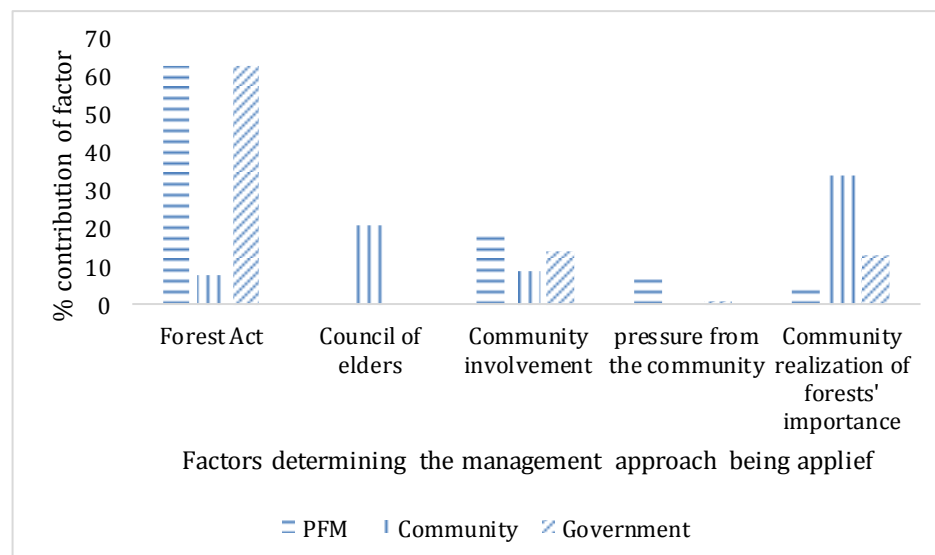


Figure 4.1: Factors determining the management approach being applied in all study sites (N = 323)

Council of Elders as a forest management strategy was only mentioned in the community regime but community involvement was mentioned in all sites. At the PFM site, household involvement was mostly seen to be happening through the PFM joint management model with only 27% indicating that the management approach was determined by community involvement. This was suggesting that household members do not see themselves as the dominant partners in the PFM model.

Interestingly, almost a third (32%) of respondents at the government regime site felt that community and government involvement determined the management regime. This was an indication that the community felt a degree of ownership over the regime even though it is government managed.

In the community regime, the indication by respondents of other emerging management approaches being implemented in the community regime may be an indication of weakening powers of the Oloibon institution. This was pointing to the frequent failure of Community Based Natural Resources Management (CBNRM) due to inadequate capacity building and poor governance, (Fabricius & Collins, 2007). This was confirmed during KI interviews and FGDs.

They provided evidence that there was an interest in the Oloibon institution to have forest protection committee members trained in modern forest management skills. It confirmed that the Council of Elders membership had been expanded to bring in National Government (NG) officials, elected leaders and the elite in the community so as to get more support in forest management. Further, the Assistant County Commissioner for Loita Sub-County indicated during KI discussion that he intervenes more frequently in community forest management conflicts than before. In 2016, the Loibon homesteads were doing timber planning signalling a diversification in forest use to include carpentry by the households. This was an indication that CBNRM is not providing for all and is changing with societal needs like requirement for modern furniture by households.

4.3.2 Initiation of Decentralization in Kenya's Forest Sector

Majority (58%) of the policy-makers indicated that decentralized forestry management was being applied in Kenya under multiple stakeholder management and PFM was being taken to be the major management approach being applied in Kenya.

The least applied approaches were community approach (26%) and centralized/government approach (16%). The three most important reasons given by policy-makers why the government started decentralization in forest management were the deterioration of forest conditions leading to inadequate resources (23%), failure of C&C approach leading to massive degradation (17%), and pressure from partners (local communities and development partners).

Decentralization was perceived to have been least influenced by trends in other sectors and the global paradigm shift towards more inclusive management system (Table 4.6). Broadly speaking, conservation factors were considered most important by 70% of respondents. Of the 30% who mentioned other reasons, most considered that decentralization was primarily a response to pressure from partners (some of which may also have been intended to improve conservation), trends in other sectors and the global paradigm shift towards more inclusive management.

Table 4.6: Factors considered by policy-makers to have led the Kenya government to initiate decentralization in forest management (N =36)

Factors that pushed government to initiate decentralization	Broad categorization*	Response (%)
Deterioration of forest conditions leading to inadequate resources	C	23
Failure of Command and Control	C	17
Pressure from partners (communities, Donor/Global community)	O	17
Low participation of stakeholders in forest management	C	10
Efficiency of conserving and management services and also in reaching the community	C	10
Devolution of power and responsibilities to FCC and CFAs	C	10
Political interference	O	4
Unresponsive policies and legislative framework	O	3
Kyoto protocol requiring communities be involved in natural resources management	O	3
Global trend in other sectors and political establishment	O	3

* The categories include: conservation (C); and others (O)

Analysis of the conservation (70%) and non-conservation factors (30%) using non-parametric test method confirmed that the conservation factors were considered a more significant reason for initiating decentralization than the non-conservation factors ($P < 0.05$) as indicated by the policy-makers. The detailed analysis is shown in Appendix V(a) and V(b). This confirms the first research hypothesis that policy-makers perceive that the main intention of decentralizing forest governance was to achieve better conservation.

This was similar to Tanzania, where decentralization was introduced to address perceived deforestation and forest degradation (Lund et al., 2015). Though, The Forest Conservation and Management Act, 2016 does not explicitly mention decentralization, it does provide for organisational structures at county government, community and KFS level that support decentralization. The Draft National Forest Policy 2015 (MEWNR, 2015) and National Forest Programme, 2016 (GoK, 2016b) have very clear discussions on devolution of forestry management in the country. Unlike in many countries, the Kenyan Constitution 2010 (GoK, 2010a) provides for devolution of forestry functions as a means for improving livelihoods, forest conservation and a means to ensure citizens' rights to a healthy and clean environment. These are also the reasons for decentralizing forestry governance in countries like Ghana (Teye, 2011). The policy-makers interviewed in this study generally showed a clear understanding of what decentralization means. However, this clarity should be further enhanced through awareness creation and capacity building to avoid improper implementation due to misunderstanding leading to poor guidance on the process by the policy-makers.

The promulgation of The Forests Act, 2005 (which has since been revised to The Forest Conservation and Management Act, 2016) was indicated by 46% of the policy-

makers as the bold step that signalled the start of decentralization of governance in the forestry sector in Kenya, this concurs with National Forest Programme (GoK, 2016b). Participatory forest management through community involvement in forest management was indicated by 15% of the policy-maker respondents as one of the major steps in Kenya towards decentralization in forestry. Decentralization functions like transforming the Forest Department (FD) into KFS, management decisions like appointments of Ecosystem Conservators, Sub-County Forest officers, with introduction of a Rural Afforestation and Extension Service (RAES) as well as a District Focus for Rural Development were also key actions. The latter two activities were undertaken in 1974 and the 1980s; an indication that decentralization in forestry has been an on-going process for a long time but has only gained momentum recently. The government was pushed to start decentralization by emerging scenarios like decentralization in the forestry sector in other countries, global trends, the need to involve communities and other stakeholders and the expectation that forestry has to contribute to community livelihoods (GoK, 2016b). These reasons are similar to those enumerated by Larson and Soto (2008), where decentralization was initiated to improve resource allocation, efficiency, accountability and equity by linking the costs and benefits of public services more closely (Bulut & Abdow, 2018). Further, local management units know the needs and desires of the local communities better than the national government. The process also provides an opportunity for holding the local leaders accountable; promote democracy by bringing the State closer to the people and increasing participation and building of social capital (Larson & Soto, 2008; Khaunya, et al., 2018).

Although about a quarter of policy-makers mentioned policies and regulations well before The Forest Conservation and Management Act, 2016, almost half said it was

The Forest Conservation and Management Act, 2016 that really initiated decentralization. This suggests that an enabling legal framework is very important to make decentralization happen. This has been observed in other countries like Nepal, where there was almost 20 years of experimentation before the 1993 Forest Act really enabled community forestry to take off (Chapagain & Sanio, 2012).

4.3.3 Decentralized Forest Governance Types Being Applied in Kenya

Policy-makers were aware that there was decentralization in the forest sector but were not always very clear on the decentralization type being implemented, with a wide range of components of decentralization (from CFAs to FCCs and specific rules relating to charcoal) being mentioned. Management types linked to PFM were mentioned by 66% of the respondents (Table 4.7). Other aspects of decentralization were mentioned by 29% of the respondents. The results indicate that policy-makers had a broad understanding of what can be included under the “decentralization” label, with only 5% referring to regulations like The Forest (Charcoal) Regulations, 2009 (GoK, 2009b) and The Forest (Timber Harvesting) regulations, 2009, (GoK, 2009c) and sustainable forest management rules (GoK, 2009d) that also have opportunities for decentralization in the forestry sector.

The household respondents were clear on which decentralization model/type being applied in the forest adjacent to them. They had clear indicators of decentralized forest governance. This was an indication that it would be easy for them to assess the level of implementation of the decentralization process as shown by clarity on decentralization indicators and outcomes. Further, the households were aware of outcomes of decentralization including; increased exercising of the bundle of rights leading to increased access of resources, stakeholder involvement in decision-making and access to information (RRI, 2012).

Table 4.7: Decentralization types being implemented in Kenya (N = 36)

Decentralization Types	Broad categorization*	Response (%)
Participatory Forest Management (PFM)	PFM	33
Community Forest Association (CFA)	PFM	18
Forest Conservation Committee (FCC)	PFM	15
Administrative decentralization through formation of forest zones and conservancy	DEC	12
Deconcentration (Decentralization of functions and not authority)	DEC	6
Management and protection of forests and woodlands by local authorities (County governments)	DEC	5
Forest (Charcoal) rules, 2009	R	3
Fiscal decentralization-KFS given powers to raise and retain financial resources	DEC	2
Market decentralization-Tendering of materials to pre-qualified saw millers	DEC	2
Timber Manufactures Association-which encompasses timber harvesting regulations and prequalified saw millers regulation, 2009	R	2
Political decentralization	DEC	2

* The categories include: PFM process (PFM); Decentralization (DEC) and Regulation (R)

The emphasis given to PFM by the policy-makers may lead to support of the process even in forests where it is not feasible like in the government regime (KFNR) where direct utilization is limited by the management objective and legislation. This is likely to happen as several documents have been developed to guide and support the process (GoK, 2009c; GoK, 2009d; KFS, 2015a). Key Informant discussion with the head of forest management plans unit in KFS reported that every single request of PFM has been allowed. This may affect the overall national implementation of decentralization, calling for urgent need to develop a national strategy to guide the process of implementing decentralization in the forest sector.

4.3.4 Indicators of Decentralizing Forestry Governance

Policy-makers identified both process and outcome indicators of decentralization which are also reflected in the National Forest Programme (GoK, 2016b). Regarding indicators of decentralization, 54% of policy-makers gave answers that referred to the process of decentralization, while 46% referred to the outcomes like creation of semi-autonomous KFS (Table 4.8). One of the most important processes was creation of the semi-autonomous KFS. This was also the case in Uganda with the creation of National Forest Authority (Banana et al., 2007; Banana et al., 2008). The formation of committees with clear roles at regional and local forest management levels and existence of governance structures at local level were also considered of importance. Though policy-makers from various organisations indicated that decentralization had improved livelihoods, they were not sure of the percentage increase. The positive view was an indication that the policy-makers are likely to support decentralization due to the perception that it has increased revenue collection and improved resource management with anticipation that it would result in a win - win situation.

Table 4.8: Indicators of forestry decentralization in Kenya according to policy-makers (N = 36)

Indicators of decentralization in Kenya	Broad category*	Response (%)
Sustainable forest resource use	O	11.5
Formation of semi-autonomous organisation (KFS) responsible for management	P	11.5
Community attitude change towards forest management	O	11.5
Ecosystem based management approach (Zonation of ecosystem areas)	P	7.7
More stakeholder (NGO, church and private) participation	P	7.7
Less conservation threats (human induced) to gazetted forests	O	7.7
Formation of County (District) Forest Licensing Committees	P	7.7
FCC responding to stakeholders' issues and mainstreaming them to KFS board	P	7.7
Subsidiary legislations being enacted to make the Forest Act operational	P	3.9
Sharing benefits and responsibilities between government and community organisation	P	3.9
Recognition of all forest types by the Forests Act 2016	O	3.9
Forest management plan	O	3.9
Efficient services	O	3.8
Creation of Charcoal Producers Association (CPA)	P	3.8
Recognition that CFAs are to take up their roles fully	O	3.8

* The categories include: Process (P) and Outcome (O)

The policy-makers had a clear understanding on the indicators of decentralization and their perception on outcomes of decentralization in Kenya, with the majority stating that decentralization led to both improved forest conservation and enhancement of community livelihoods. The decentralization indicators and outcomes show the indicators and outcomes were in conformity with findings of Bazaara (2003), which indicated that devolution of decision-making power over natural resources to publicly accountable local authorities is frequently advocated as a means of achieving social development and enhancing environmental management. Though the decentralization process was in its infancy (Bulut & Abdow, 2018), evidence from KIs in the field

supported the policy-makers' perceptions. Through the CFAs, communities in the PFM regime site had started fundraising and implementing activities like raising tree seedlings for sale, butterfly farming, eco-tourism facilities and processing of herbal products. They showed competence by undertaking some forest management functions like controlling access to defined forest resources like firewood and grass. This is well supported by subsidiary legislations and guidelines (GoK, 2009b; GoK, 2009d; KFS, 2009; KFS, 2015a; KFS, 2015b; KFS, 2015c). The clarity of indicators of decentralization and recognition of outcomes show policy-makers are aware of the decentralization process, goal and expectations.

4.3.5 Contribution of Decentralization to Forest Conservation and Livelihoods

Policy-makers felt decentralization had led to positive outcomes for both conservation and livelihoods. This was one of four possible relationships described by Adams et al. (2004) between conservation and development, and most prominent among conservationists. Policy-makers (33%) highlighted the importance of PELIS in improving livelihoods as was noted by the National Forest Programme (GoK, 2016b). This was because of allowing tree growing and crops to rehabilitate degraded forest plantations as noted by Chomba, Nathan, Minang and Sinclair (2015).

Policy-makers felt (84%) that decentralization had led to better forest conservation with 16% disagreeing or were unsure. Those who agreed with the statement were significantly higher (using Binomial non-parametric test, $p < 0.05$). The detailed analysis is as outlined in Appendix VI (a) and VI (b). Based on policy-makers' perceptions, therefore, this confirms the second hypothesis that decentralization leads to better forest conservation. The main outcomes of decentralized forest governance in Kenya were indicated to be sustainable forest use and community attitude change towards forest management. According to policy-maker's decentralization led to

sustainable forest utilization (better forest conservation). The processes associated with decentralization (e.g. community involvement in decision-making, devolution of power and increased trust) were perceived by policy-makers (broadly 59%) to have led to better forest conservation through contributing to sustainable utilization of forest resources and thus improving the livelihoods of forest adjacent communities (Table 4.9).

Table 4.9: Reasons why policy-makers believe decentralization contributes to better forest conservation (N = 28)

Reasons why decentralization contributes to better conservation	Broad category *	Response (%)
Sustainable forest utilization leading to improved community livelihoods	O	37
Communities are involved in decision at all levels	P	33
Devolution of power and authority to lower management levels	P	11
Stakeholder trust in KFS revived through membership in FCCs	P	11
Devolved structures have enhanced transparency and accountability	P	4
Increase in industrial forest plantation	O	4

* The categories include: Process (P) and Outcome (O)

Policy-makers (73%) indicated that decentralization has greatly improved community livelihoods while 27% had a view that decentralization has not enhanced the livelihoods of local communities. The policy-makers' perception that decentralization had contributed to improved community livelihood was highly significant ($P < 0.05$) as per the output of non-parametric test. The analysis is outlined in Appendix VI (c) and VI (d). This confirms research hypothesis three that decentralized forest governance leads to improved community livelihoods. There are several forestry livelihood activities that the policy-makers attributed to implementation of decentralization, the key ones being PELIS where communities are

allowed to grow trees as they tend young plantations and IGAs. This confirms the third hypothesis that decentralization of forest governance lead to significant improvement household livelihoods (Table 4.10).

Table 4.10: Community livelihood activities attributable to decentralization according to policy-makers (N = 36)

Activities	Response (%)
Re-introduction of Plantation Establishment and Livelihoods Improvement Scheme (PELIS)	32
Community Based Enterprises	24
Promoting community user rights	23
Sustainable access to timber and non-timber forest products	12
Community participation in income generating activities	9

4.3.6 Benefits of Decentralized Forestry Governance

Policy-makers indicated a wide range of benefits from decentralization (Table 4.11), of which about 57.8% can be broadly categorised as being linked to improved participation (P), about 11.7% concerned with livelihoods and 35% focused on conservation. Although policy-makers reported many benefits of decentralization, only 22% felt that it was a very effective form of day-to-day forestry management in Kenya, 45% rating it moderately and 33% low. This generally positive perception of decentralization by policy-makers points to a likelihood of decentralization being institutionalized as a management approach due to the aforementioned benefits.

Table 4.11: Benefits of decentralization in the forestry sector in Kenya (N = 36)

Benefits of decentralization process in the forestry sector in Kenya	Broad categorization*	Response (%)
Improving natural resource management leading to increased tree cover and reduced forest destruction	C	22.0
Improve public active participation (community and stakeholders in decision-making)	P	17.1
Minimal conflicts and less costs on enforcement	P	10.2
Cost incurred by central government in forest management have reduced	P	8.8
Improved transparency and accountability	P	5.8
Improved relations between State and community	P	5.8
Improved understanding of responsibilities by various stakeholders	P	5.8
Benefit sharing (avenues for community livelihood improvement)	L	4.4
Enhanced community income	L	4.4
Ownership of resources and responsibility levels of stakeholders enhanced	P	2.9
Initiation of rural development	L	2.9
Increase resources for forestry sector from government	C	2.9
Wide pool of resources available to management	C	1.4
Use of indigenous knowledge in conservation	C	1.4
Increase donor confidence and support	C	1.4
Devolved units of governance to lower levels	P	1.4
Sustainability	C	1.4

* The categories include: Conservation (C) Participation (P) and Livelihoods (L)

4.3.7 Level of Satisfaction of Stakeholders with Decentralization Process Meeting the State and its Objectives

The policy-makers indicated that they were satisfied (75.6%) that decentralization was meeting the State's main objective for decentralizing governance, 13.9% reported no change while 11.1% were not sure. The government policy-makers' perception that decentralization was meeting the State's objectives for introducing decentralization did not agree with the civil society policy-maker's perception. The State's satisfaction was attributable to the shedding of functions and responsibilities

and associated costs while almost retaining exclusive power and authority. This could be mitigated through development of a decentralization strategy to guide implementation and provide a uniform mode of evaluating the progress of the decentralization process fairly. This may be a pointer to a scenario where the mode of decentralization was likely to be deconcentration and delegation where responsibilities are devolved to the field units but the headquarters retain the power and the civil society are being assigned responsibilities with hardly any rights.

The low satisfaction rating with decentralization among communities was due to the process being at infancy implementation phase and no special funding set aside for supporting the process and the government still was in charge of the process. This scenario requires participation of NGOs and civil society and facilitation to ensure that decentralization is implemented as per its principles and the community are able to access the benefits of decentralization. This would facilitate their movement towards high satisfaction level and avoiding a situation of the process reverting to command and control.

Focus Group Discussion showed that decentralization has enabled communities to participate in forest management and reduced costs for KFS leading to improved forest management. Communities in Virhembe in the PFM regime more satisfied situation than Ileho and Ikuywa was attributed to PFM activities which were bringing income to the communities leading to improved livelihoods. Communities in Olorte were practicing irrigation farming using water from the forest which translated to improved livelihood thus feeling of a fair deal. Manandhar and Shin (2013) showed that community forestry in Nepal as is PFM in Kenya improve rural livelihood, their participation, rural development and use of forest products.

The policy-makers' opinions on whether decentralization in the forestry sector had achieved its objectives were varied (Figure 4.2). All KWS and Civil Society respondents had low levels of satisfaction with the decentralization process. KFS respondents had low levels of satisfaction with the decentralization process. KFS respondent's recorded low levels of satisfaction but 41% felt satisfied. Respondents from other departments were the only ones where a small majority (52%) expressed satisfied. The community regime did not exhibit a "very satisfactory" with their involvement in management. This was attributed by Focus Group Discussion to the situation where communities were participating but witnessing a few members unfairly accessing benefits especially land as was noted by Garcia (2015) and exercising more power over the resource. This brought the perception that community management may not be addressing the conservation needs of the entire community or households.



Figure 4.2: Level of satisfaction of different stakeholders with decentralization process meeting its objectives

Stakeholders' were variedly satisfied with decentralization meeting its (decentralization) objectives and State objectives for decentralization except KFS which was satisfied with both. KFS was not losing in either situation as it was not meeting the costs of the other stakeholders' participation and their participation was not reducing its benefit (revenue) or authority over the resource. Additionally, the government and the community together with civil society had different opinions on satisfaction with decentralization meeting its objectives for decentralizing forest governance. While the government indicated that it has been positive in all cases, the other stakeholders felt it has not adequately met the objectives. This requires development of a national criterion that will be met by decentralization guided by principles of decentralization. This would be part of the national decentralization strategy. This will provide a platform to fairly address the concerns of the other stakeholders so as to enhance the stakeholders' level of satisfaction.

4.4 Impacts of Forest Governance Type on Forest Conservation (Size and Quality)

This section provides evidence on Research Question 2.

4.4.1 Vegetation Change and Land Use Cover Change Analysis

4.4.1.1 Fragmentation Analysis in Community Regime

Loita forest area has been stated to be 33,000 hectares with no defined boundaries (Kiyiapi, 1999). Participant observation showed that settlement and farming were being allowed on the West of the forest with more expansion around the swamp (Empupurtia) which has impacted negatively on forest conservation. Timber splitting was occurring in the whole forest. There was less forest degradation from 1990 to 2000 but forest condition degraded in all the three zones between 2000 and 2010 with thick forest in Oloosoyian (A) reducing from 62% to 48% (Figure 4.3). Thick forest

reduction between 2000 and 2010 was attributed by FGD to increased construction due to increased settlement and demand of building materials by adjacent settlements of Ilkerin, Olorte, Olmesutie, Ilmaral, Morijo and Nkopon and those inside the forest. Olorte (C) had witnessed the highest reduction in land area under grass from 72.1% to 6.7% between 1990 and 2010. Communities attributed to clearing of areas for farming under irrigation and expanding maize farming and livestock (sheep) grazing. The slight increase in thick forest in Olorte over the years from 1990 to 2010. This was attributed by FGD to extensive settlement, farming and shifting from livestock keeping to maize growing which has also forced the households keep their livestock away from their farms to minimize animals straying into their maize plantations. Olorte area was the most settled, near a shopping centre, NGO office, tourist camp, schools, good road network and has the most expansive maize and vegetable growing. All the glades are being converted to farms, homesteads and bare areas. In Korkoyo (B), a similar trend was witnessed with thick forest reducing from 74% to 56% within same period. This was maintained during FGD and attributed to drought in 2004 where Loitans from Tanzania brought their livestock to Kenya leading to overgrazing in the forest where tree branches were lopped to feed livestock.

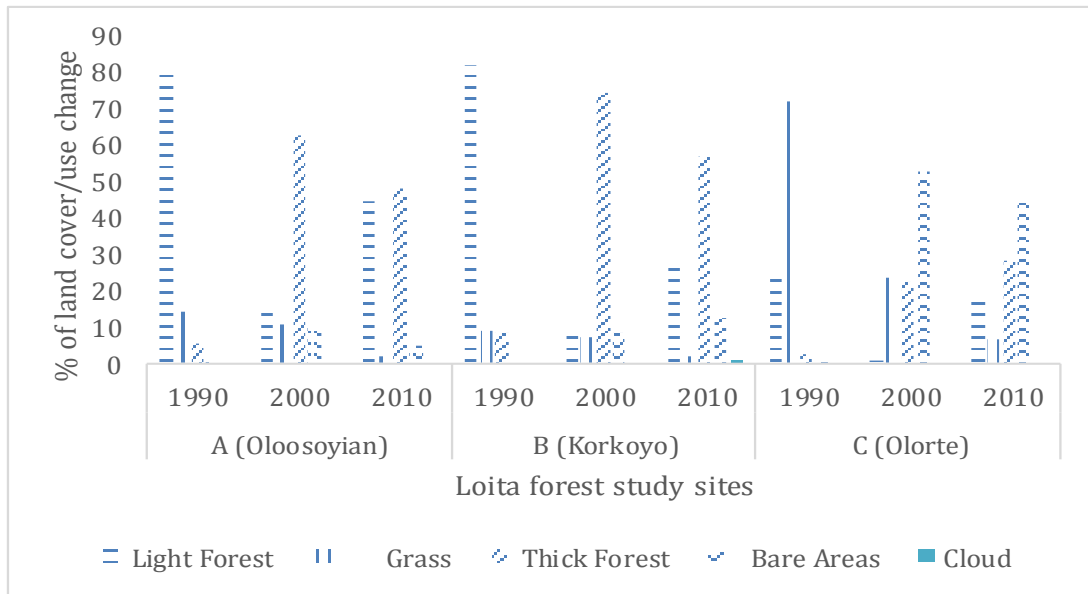


Figure 4.3: Forest land use change analysis for Loita forest study sites

The images showed that the area under forest has been reducing since 1990. Entasikira was inside the forest in 1990, and by 2010 the forest had been cleared (Figure 4.3, 4.4 and 4.5). Further, the forest extent (size) and quality were indicated by the communities (FGD) to have been reducing because as communities were settling down, they were clearing forest areas next to their homesteads for crop farming and livestock kraals. Forest areas away from the homestead were more intact and were being used for grazing, timber and medicine. The grass area was reducing in the entire forest. This was attributed by FGD to increasing sheep in the forest. The numbers of sheep have been increased by the farmers as a coping strategy as they indicated that they are more resistant to diseases than goats. Increased sheep population was leading to overgrazing with resultant bush-land replacing the grassland and settlement in the glades was further exacerbating the situation.

In LCF, the forest area adjacent to Entasikira was facing degradation. This state was confirmed during FGD and attributed to households and married members of households moving to other areas in the forest. Garcia (2015) referred to this

relocation as "grounding claims" which is the practice of inscribing and altering the landscape with visible markers that are socially understood in Loita as conveying the notion of individual property. Figures 4.4, 4.5 and 4.6 show how forest land cover changed in Loita forest between 1990 and 2011. Changes in specific land cover classes are shown in the graphs adjacent to the image. The forest areas near settlement had high value tree species cut and evidence of past disturbance was associated with high regeneration rate. Kirtilikini forest zone which was adjacent to Morijo town faced degradation to settlement, rapidly expanding maize farms and tree cutting that targeted trees of diameter between 25 cm and 50 cm. Further, as noted by Banana, Gombya-Ssembajjwe and Bahati (1999), this could be because of lack of interest and motivation of the community scouts who are volunteers with no tangible benefit accruing to them.

The premise that "You cannot steal from yourself"; a scenario individual tenure system can create (Mbuvi et al., 2015) was an underlying principle which has made the Loita community refuse land sub-division as they believe that privatization of land to individual land ownership would be detrimental to their long-term survival by resulting in the destruction of the forest which would be detrimental to their pastoral lifestyle. This was what Mandondo and German (2014), referred to as societal stake. The Loita community are negating this traditional tenet by the elite and wealthy members delineating (exercising *de facto* exclusion and withdrawal) large tracts and building magnificent homesteads in the forest. The number of homesteads around the largest swamp in the forest Esere Empupurtia saw the number of households increase from one in 2007 to over eighty households in 2011 (Per. Comm. Mr Lokopien Parletto Manager of Camp site). The need for a management plan was underscored by

the Oloibon as it would provide forest utilization zonation, training of community and awareness creation on the need to conserve the forest.

This study has confirmed this trend as the Loita forest land cover change thick forest reduction was oscillating between 6% in 1990, 62% in 2000 and being 49% in 2010. This frequent land cover change could be a reflection of instability in community control and failure to impose modern management procedures which has allowed timber cutting and settlement in the forest. Kiyipi (1999) observed that human impacts are currently very limited in Loita community forest and confined to settled zones. Further, Kiyipi (1999) had observed that as the population of the adjacent communities' rises and infrastructural development starts in the area, demand for forest products is likely to go up creating threats to the forest ecosystem. These predictions were confirmed by the present study. Participant observation, KI and FGD during this survey indicated forest and forest land use were happening as a results of people settling in the forest including construction of schools, farming being allowed, homesteads coming up, vegetables growing in the wetlands and swamps through draining and construction of churches especially around the major swamp in the forest.

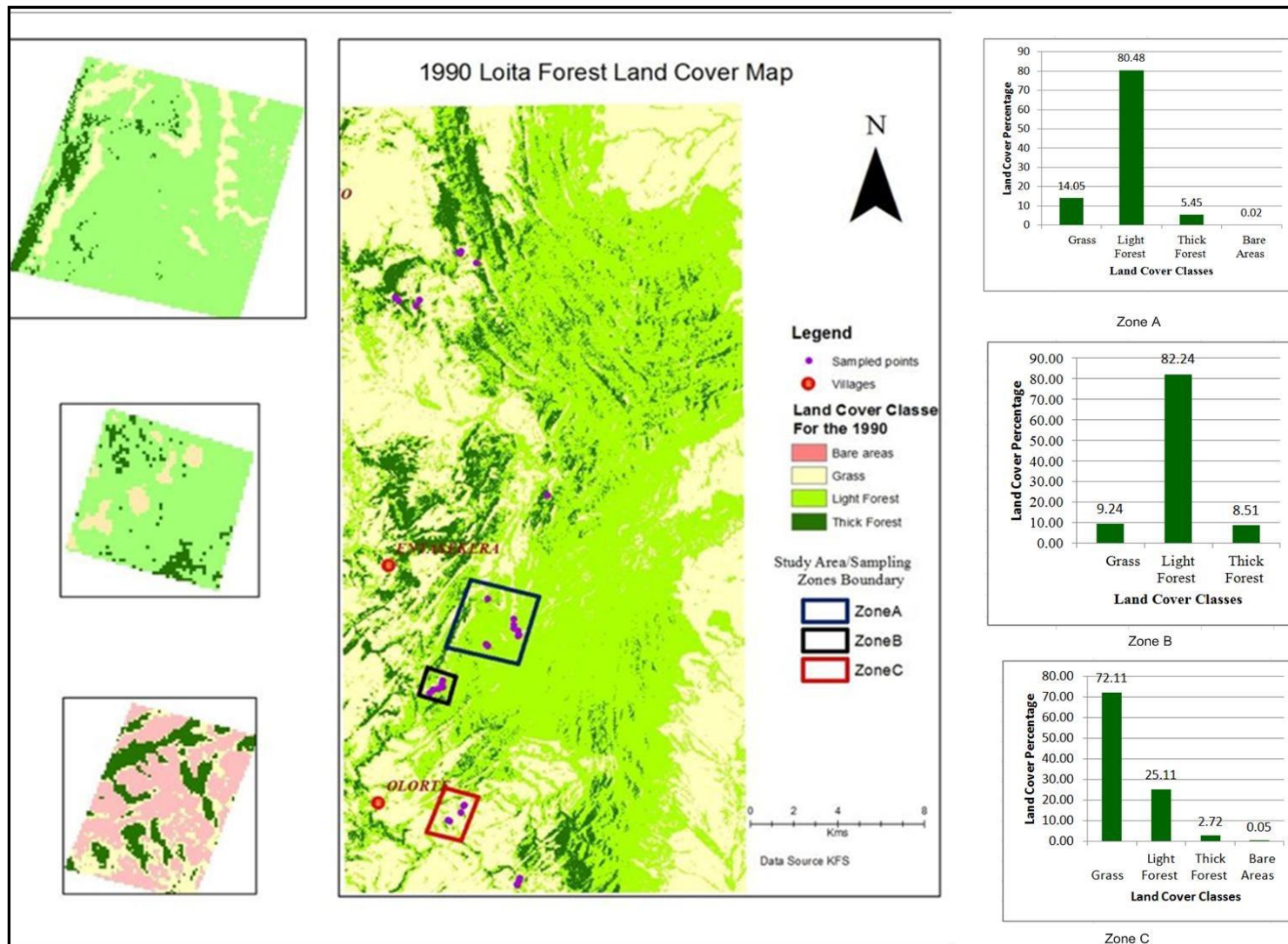


Figure 4.4: Loita forest cover in 1990 (Data Source: KFS)

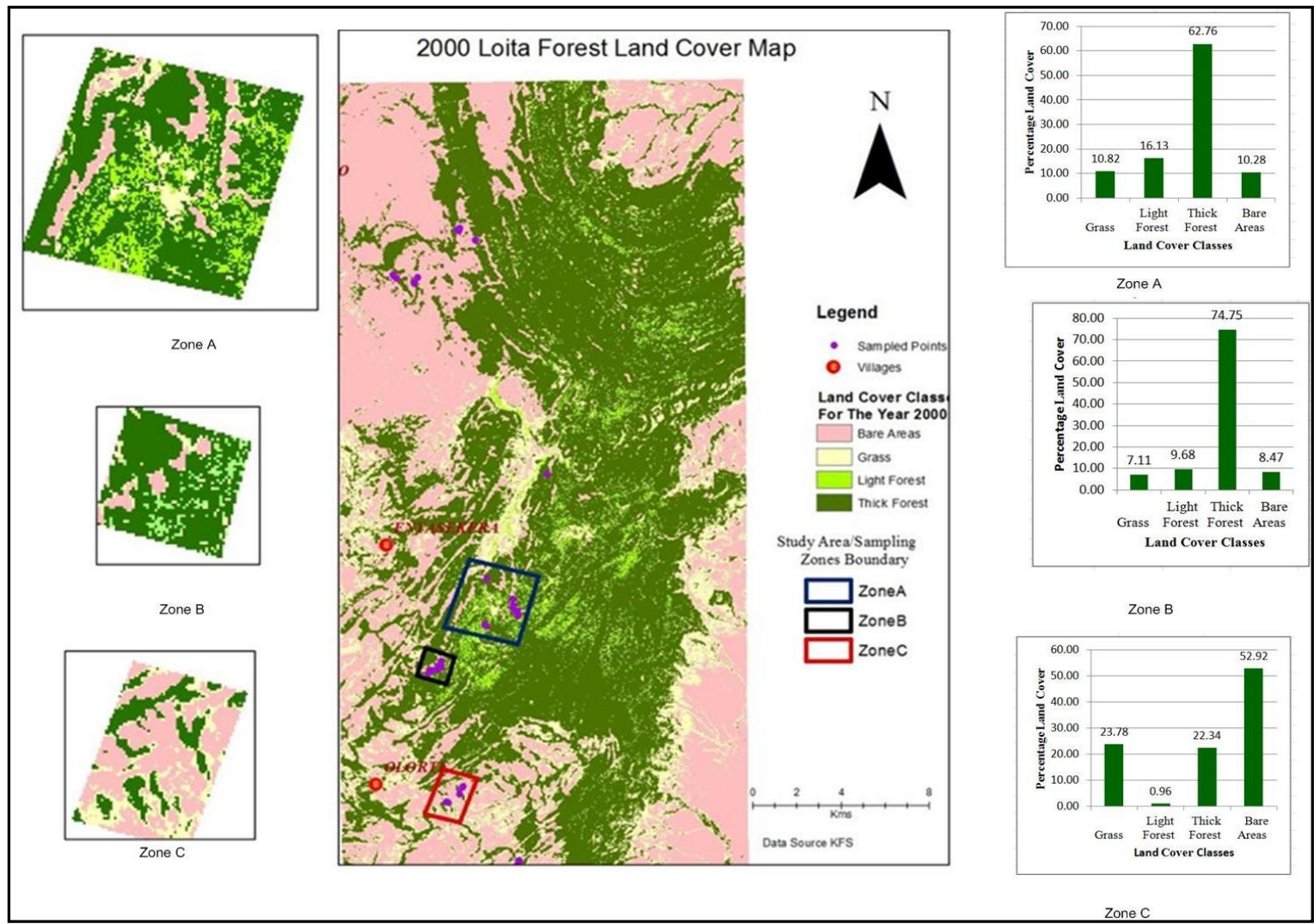


Figure 4.5: Loita forest cover in 2000 (Data Source: KFS)

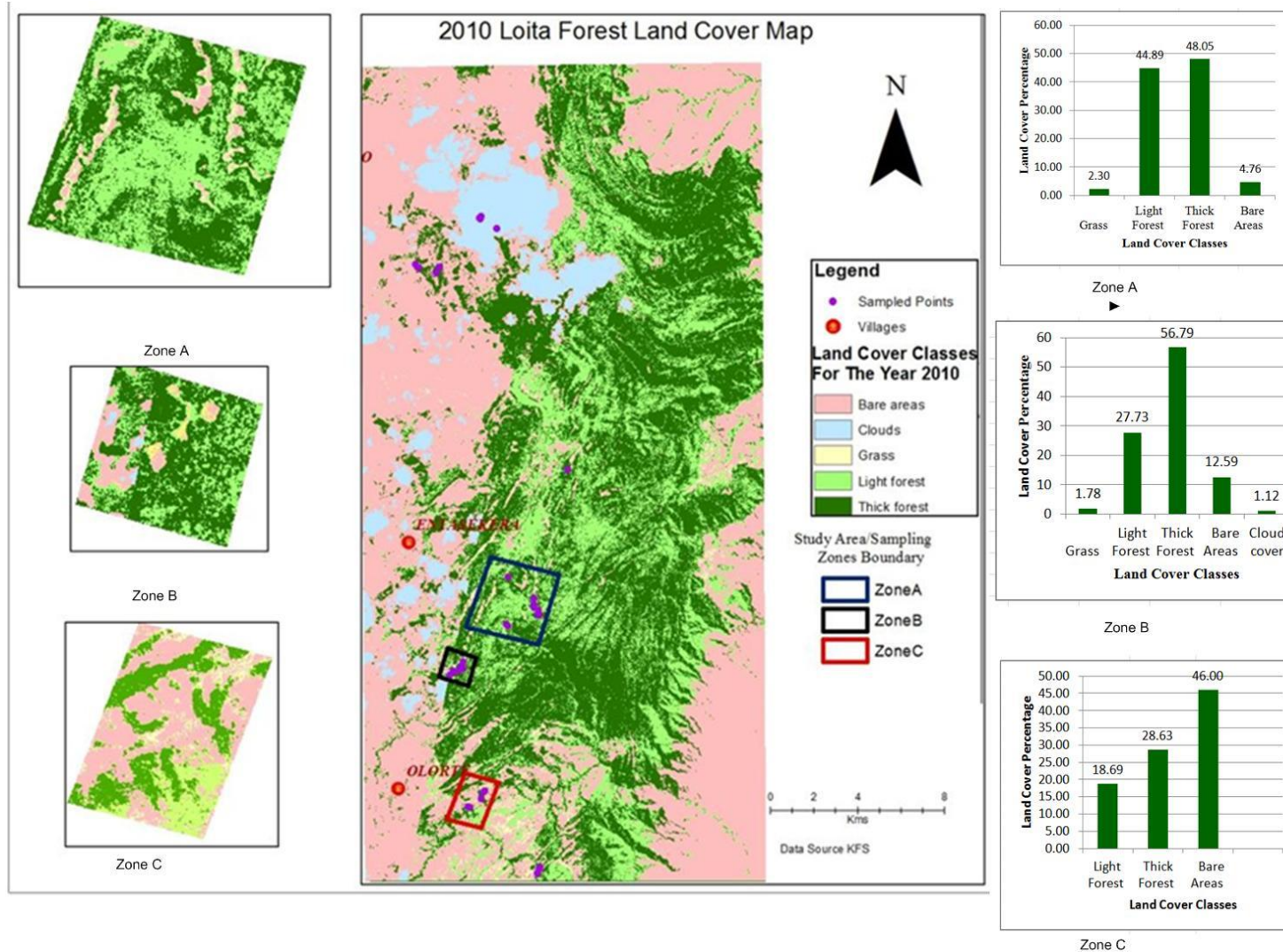


Figure 4.6: Loita forest cover in 2010 (Data Source: KFS)

4.4.1.2 Fragmentation Analysis (Land Cover Change Analysis) for Government and PFM Regime (Kakamega Forest)

Fragmentation analysis of satellite images from 1990 to 2011 for the whole of Kakamega forest (KFR and KFNR) showed an increase in fragmentation (particularly in the 2000-2011 period) and a general shift from thick to light forest (Figures 4.7 to 4.11). The thick forest reduced from 61.3% of the total area in 1990 to 53.0% in 2011 with a marked reduction being witnessed between 2000 and 2011. The increase for light forest section was gradual but grass area reduced mainly due to planting through PELIS and re-forestation of glades in the forest. The most notable cases were where a forest area was excised to pave way for the establishment of the Kakamega show ground and construction of prison. The forest edge suffered more degradation over the 20-year period, an indication of poor policing and encroachment on forest boundaries through grazing and farming.

Land cover class change percentage for four sites in Kakamega forest provided a more detailed analysis. The sites included a site in the government regime and three sites in the PFM regime including Isecheno (close to the forest station), Chelovani and Ileho. The light forest in Isecheno increased from 17% to 39% between 1990 and 2011 with same period witnessing thick forest increase from 13% to 61% (Figures 4.6 to 4.10). This could be attributed to involvement of stakeholders especially communities in forest management who are accessing benefits formally. Most of these benefits have been derived from PFM related initiatives like beekeeping and butterfly farming. The grassland has been reducing and by 2010 it had been replaced by other land uses such as tree planting, crop farming and settlement.

In the Chelovani area, which is located far away from the stations and forest ranger outposts, the bare area increased from 5% to 10% between 1990 and 2011 with the area witnessing an improvement in thick forest from 6% to 25%. The Chelovani area also shows an increase of light forest areas over the 20-year period from 29% to 49% and a drastic reduction of the area under grass from 60% to 16%. Ileho, which is the least policed, witnessed a reduction in thick forest from 55% to 9% at the same time as an increase in light forest from 25% to 29% and in the area under grass from 2% to 41% within same period. This was indicated by KI to have been caused by cutting of trees due to poaching and grazing due to poor policing.

In the government regime, both the light and thick forests have been increasing over the last 20 years at the same time as grass and bare areas have declined. This is probably because the governance regime confers authority on KWS to manage the forest and makes them wholly responsible for developing and implementing the management plan as well as ensuring they have the requisite capacity for effective management.

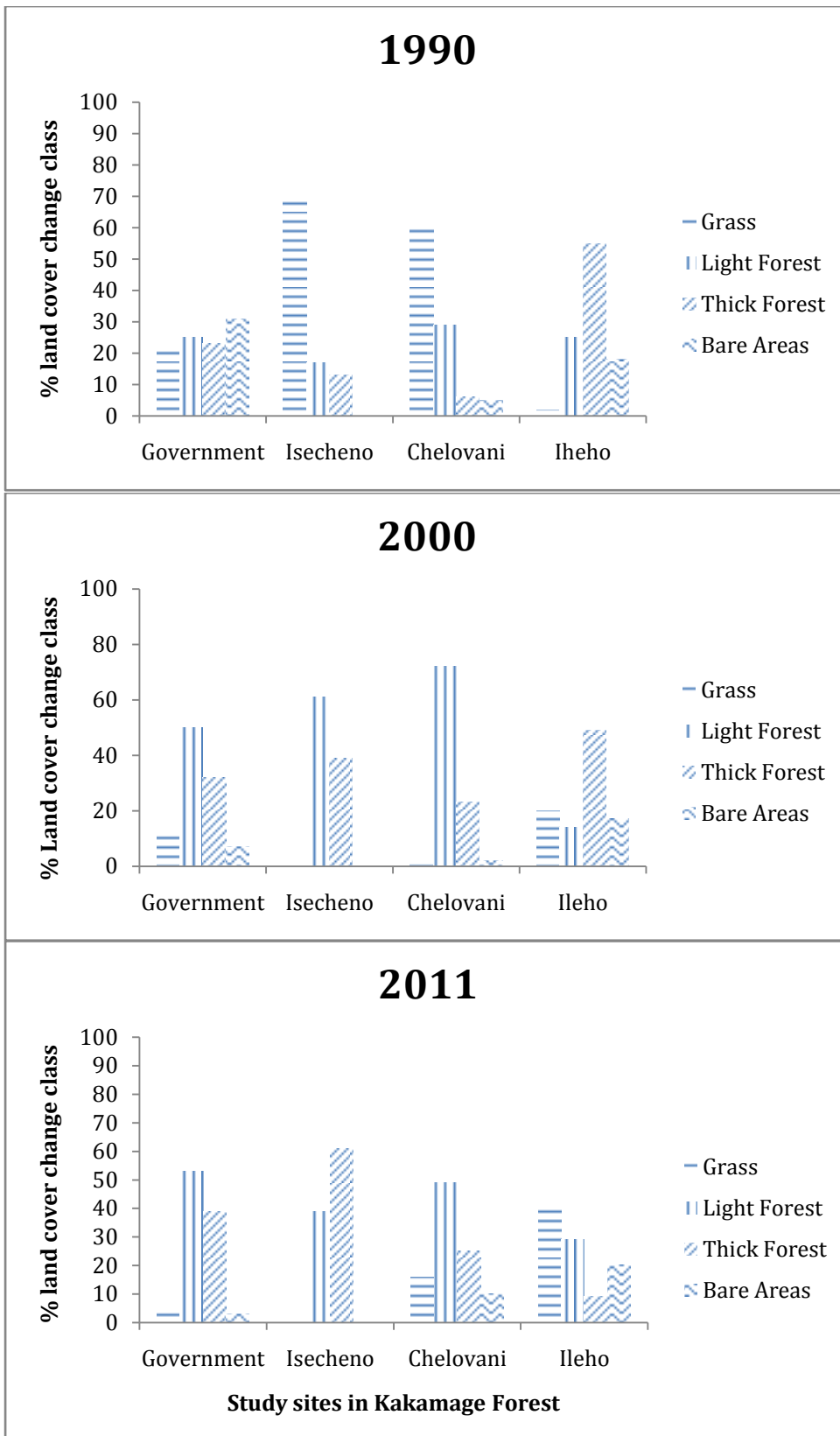


Figure 4.7: Fragmentation analysis of Kakamega forest area (Government and PFM Regime)

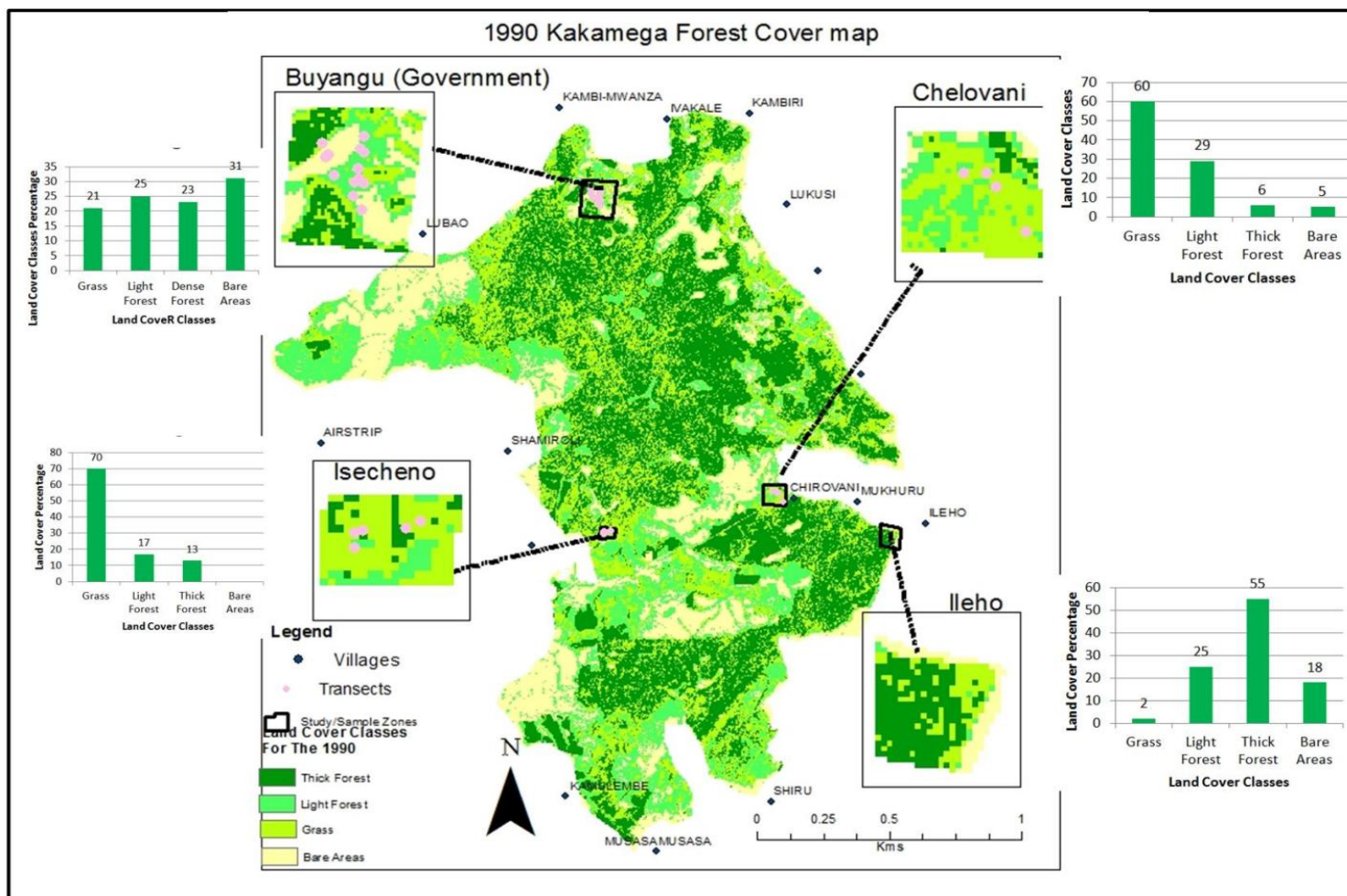


Figure 4.8: Kakamega forest cover: 1990 (Data Source: KFS)

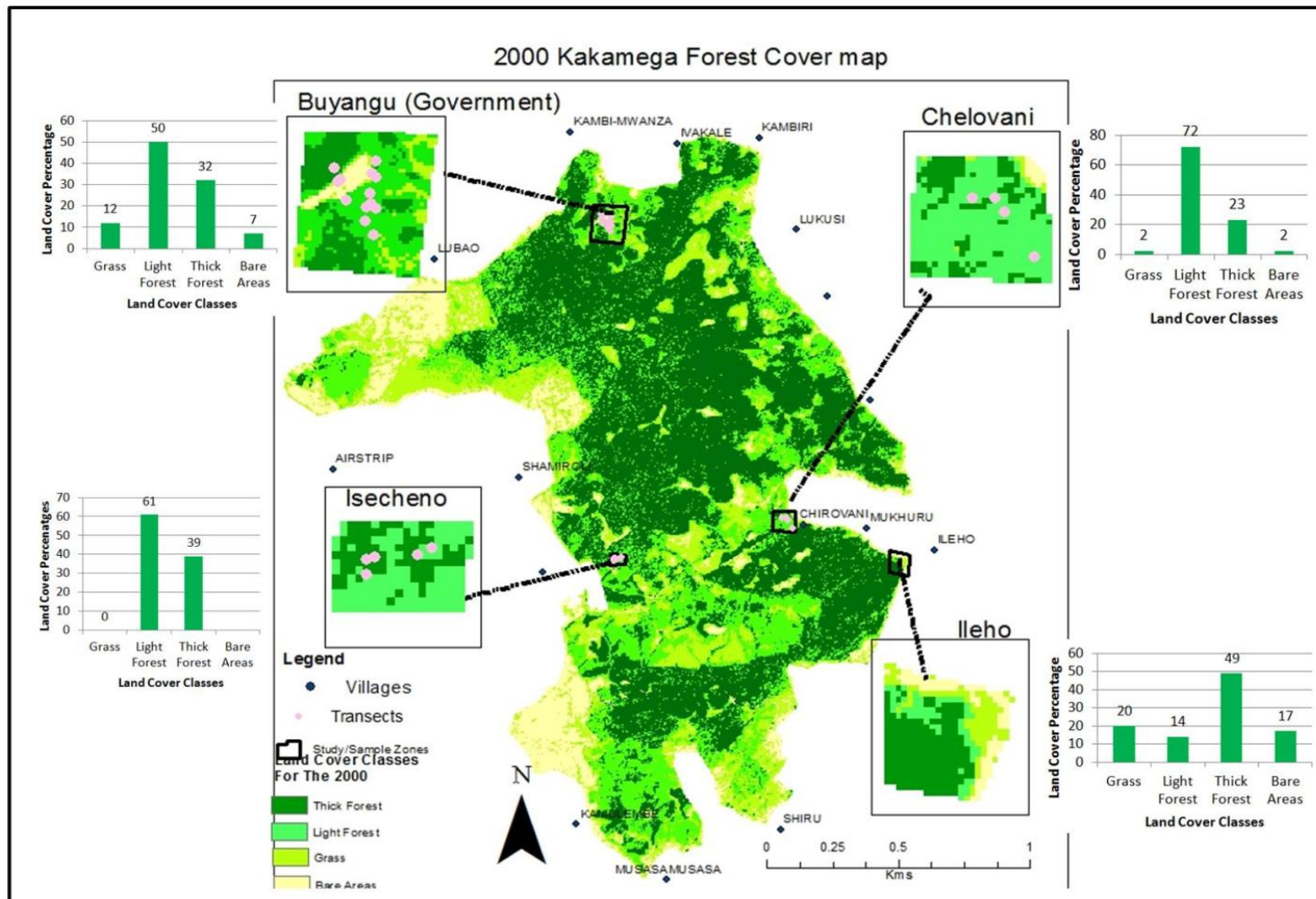


Figure 4.9: Kakamega forest cover: 2000 (Data Source: KFS)

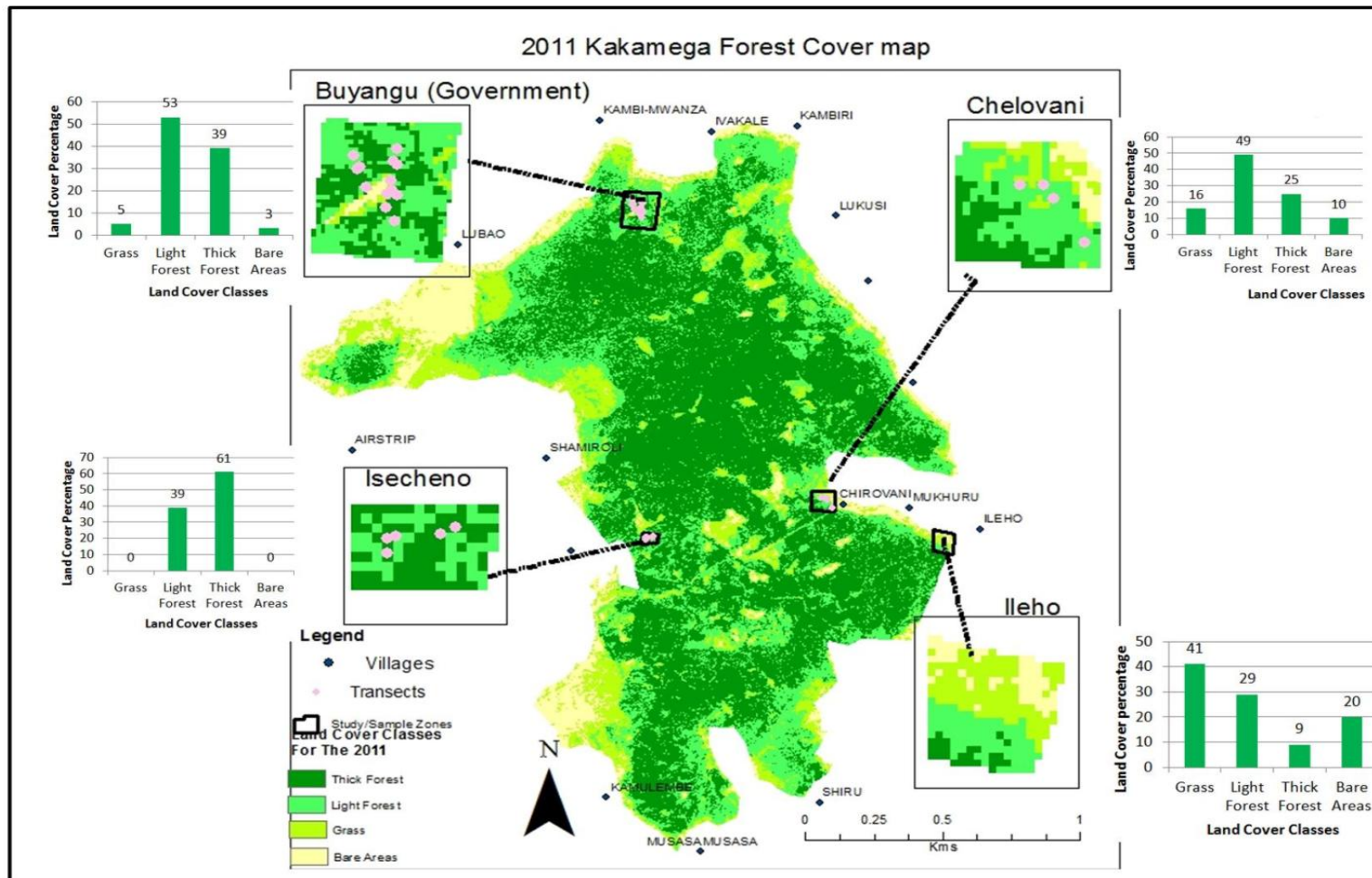


Figure 4.10: Kakamega forest cover: 2011 (Data Source: KFS)

Figure 4.10 provides a detailed explanation of the perceived reasons for change of the observed status in 2011 through FGD discussions and Key informant interviews. The causes were both legal and illegal with social needs being the major driver.

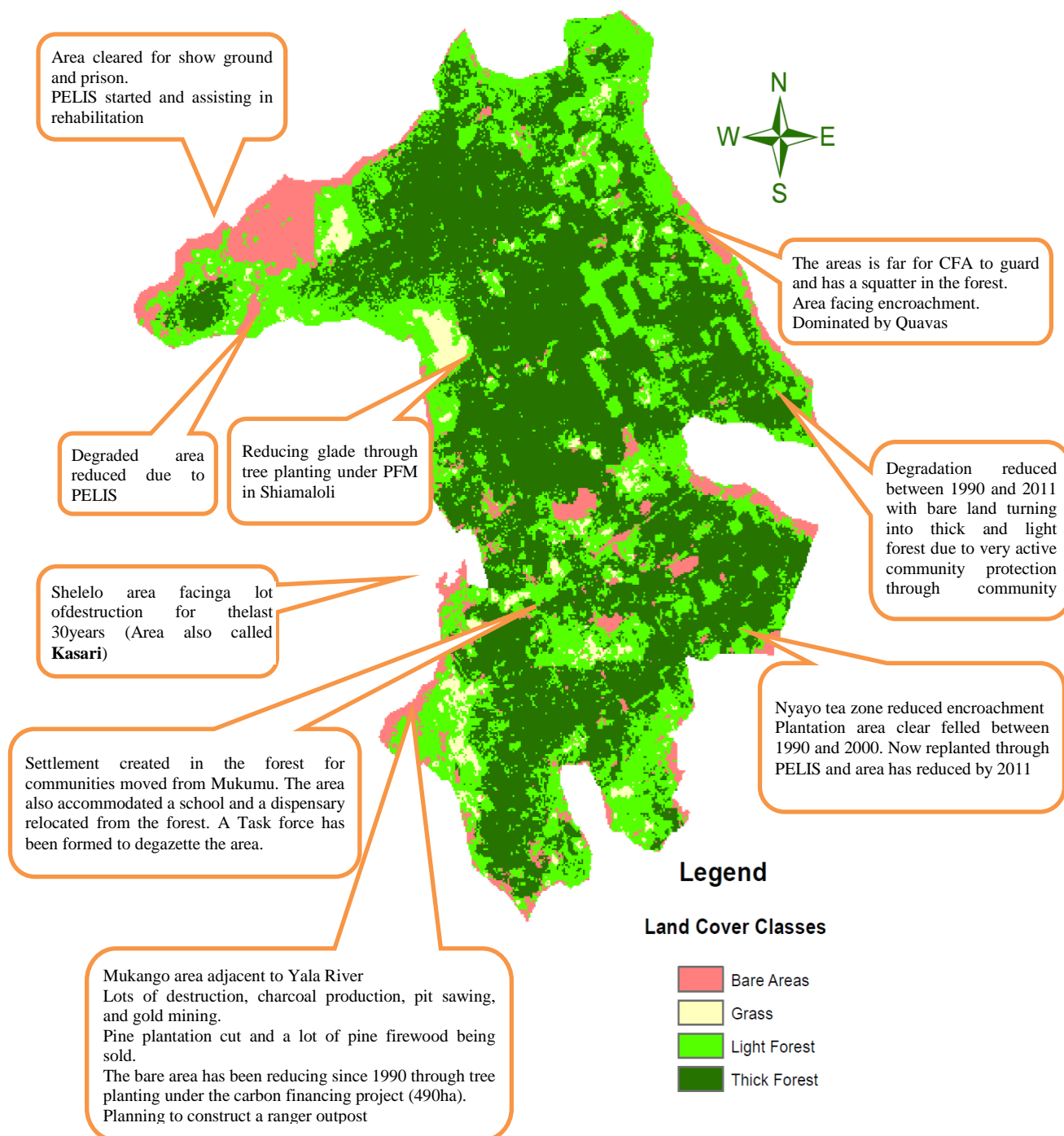


Figure 4.11: Kakamega forest land cover in 2011 and reasons for change (Data Source: KFS)

The level of degradation was varied, with the government regime in Kakamega forest where C&C was being applied exhibiting least disturbance and high regeneration which was common in primary zone of the forest where there was better protection in Kakamega forest. The primary section of the government regime in the Kakamega witnessed an increase in dense forest from 33% to 44.6%. This may indicate that the whole forest is not being uniformly protected and that the regime type may not be the sole determining factor of forest condition.

Ileho area which is located far away from Isecheno forest station showed an increase of both bare and grass areas though the area under grass reduced between 1990 and 2000 but witnessed a drastic increase between 2000 and 2011. The area experienced reduction in light forest with the thick forest increasing between 2000 and 2011. This was attributable to degradation from encroachment and grazing as the area is far away from the station. This conforms to the observation by Muller and Mburu (2009) that higher clearing rates were observed in the less strictly protected Forest Reserves than in the more strictly protected National Reserves. The situation in KFR conforms to the principle of conservation where the conserver of forests is concerned about posterity but appreciates that humanity would require timber while the preserver (KFNR) hopes to keep large areas of the forest untouched by human hands as indicated by Passmore, (1980), as cited in Chebii, (2015).

The forest condition was improving in all the sites, with the PFM regime witnessing reduced degradation especially the area near the forest station. Decentralization through PFM seemed to be contributing to better forest management (Blomley et al., 2008, as cited in Lund et al., 2015) that there was improved forest condition and lower disturbance in forest under decentralized governance. Within the PFM site, it also shows that better management was achieved in the areas near the Isecheno station.

This was confirmed by KI and during FGD which explained that proximity to the forest station at Isecheno meant that the area was under better patrolling, the community was more engaged and the communities are engaging in Income Generating Activities (IGAs). Global experience of cases of PFM shows that PFM has a positive impact on rural livelihoods, governance and forest condition (Lawrence, 2007).

The forest degradation in Kakamega forest between 1933 and 1981 was caused by logging and extraction of commercially valuable timber, followed by charcoal production, cattle grazing, PELIS, hunting for bush meat and removal of dead trees for firewood as noted by Bleher, et al. (2006). Ecological and GIS based studies (Lung & Schaab, 2006, as cited in Guthiga, 2007) have shown that the forest area in KFR (PFM regime) was more disturbed than KNFR (government regime) section. Guthiga (2007) indicated that the main challenge facing the PFM regime was poor enforcement due to inadequate budgets, manpower and patrol vehicles to cover the whole forest. However, the scenario had changed by 2012 as KFR (PFM regime) was manned by three vehicles and the patrol capacity had increased with well trained and armed forest rangers.

Historically, deforestation in Kakamega Forest was characterized by incremental deforestation rather than by sudden change in forest cover. The least disturbance witnessed in the government regime was attributed to C&C that did not allow direct resource utilization and effective KWS management. This study found that the forest area in Kakamega has not changed much but the quality of the forest has been affected with the forest edges being the most affected especially in KFR. This could be attributed to poor policing and high population pressure, keeping of livestock and reducing household land holding units. This conforms to observations by Muller and

Mburu (2009) that natural forest clearing was detected across most of Kakamega Forest, with clearing clusters in the southern part and at the edges of the natural forest blocks with higher clearing being observed in less strictly protected forest areas. This was also observed by Lund et al. (2015) where the forest area disturbed reduced between 1999 and 2001 while disturbance increased in remote parts far away from the station.

4.4.2 Ecological Assessment of Study Sites

4.4.2.1 Community Regime (Loita Forest)

In the community regime, the quality of the forest improved in forest areas far away from settled areas. This was corroborated by ecological survey (Figures 4.12a, 4.12b, 4.12c and 4.12d). The area far away from major settlement like Mause section of the forest had big diameter of individual valuable trees species like *Podocarpus falcatus* Mirb. (DBH 174 cm) and less trees of lower DBH. The areas were experiencing low regeneration as the vegetation was at climax stage. In Entasikira, the bigger trees were of low timber value, *Ficus thonningii* Bl. (DBH 188 cm) though the area was experiencing fewer disturbances because of presence of national government especially the chief, Assistant County Commissioner and KWS rangers.

In 1999, the main forms of disturbance in Loita forest were wildlife and human with anthropogenic impacts being limited and confined to settled area (Loita Forest Integrated Conservation and Management Project, 1999). The main driver of degradation was identified as selective overharvesting of *Juniperus procera* Endl. and *Podocarpus latifolius* (Thumb.) Mirb. for fencing poles and construction timber (Maundu et al., 2001). Field observations and FGDs between 2012 and 2016 showed that forest degradation drivers had expanded to logging, farming of cereals and

vegetables, construction of shopping centres and schools inside the forest due to increasing population and changing land use and lifestyles.

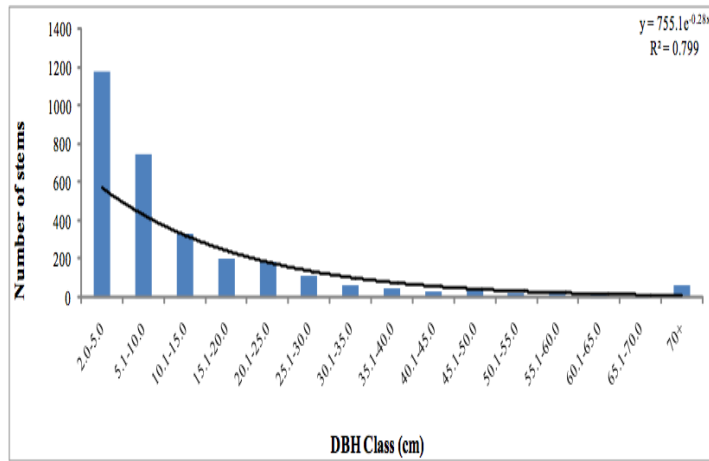


Figure 4.12a: Diameter Class distribution of Loita in General

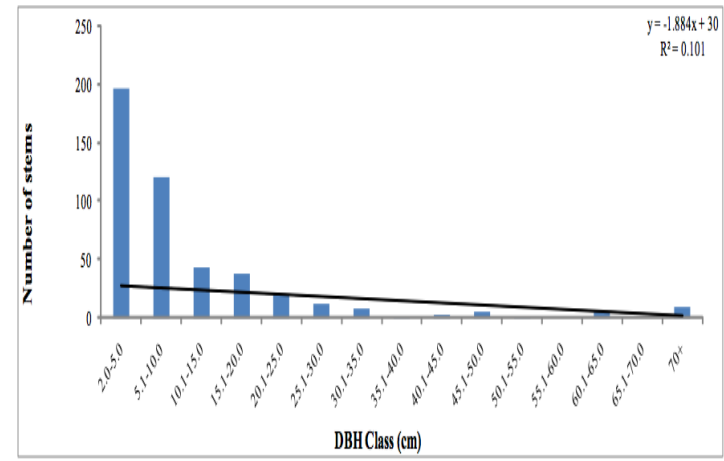


Figure 2.12b: Diameter class distribution in Kirtikilini

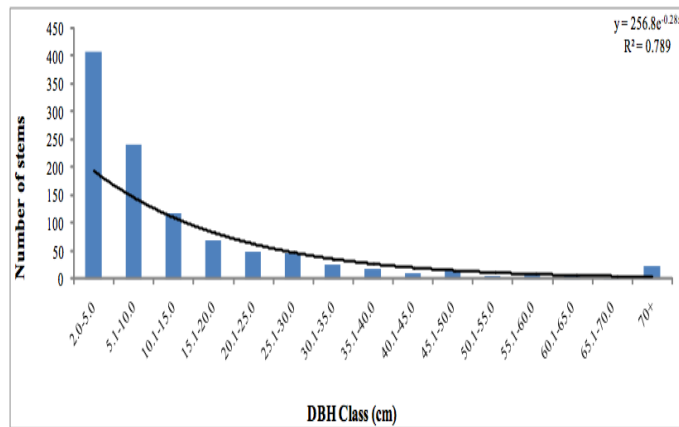


Figure 4.12c: Diameter class distribution in Entasikira

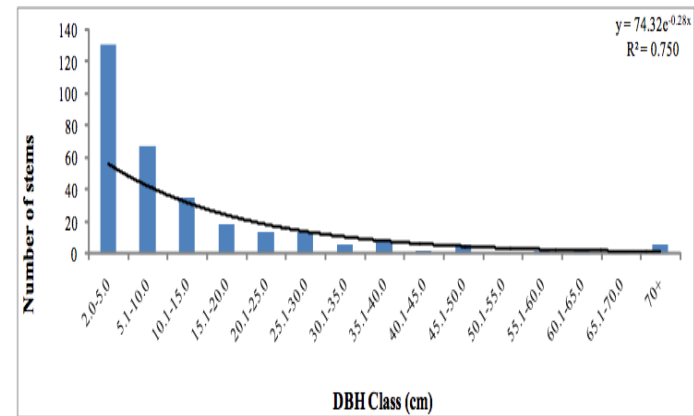


Figure 12d: Diameter class distribution in Mausa

Forest ecological condition at 7 sites in Loita forest is outlined in Table 4.12. Forest regeneration was seriously affected by grazing mainly by sheep, goats and donkeys. This was more rampant in Entasikira, Oloosoyian and around the swamp. Mausa and Korkoyo were least affected as they are far away from settlement, farming was not allowed by the traditional authorities and grazing was not done intensively.

In the community regime, forest regeneration was seriously affected by grazing of sheep, goats and donkeys which was having a negative effect in Entasikira and Oloosoyian but Mausa and Korkoyo were least affected as they are far away from settlement. According to Kiyiapi (1999), most tree species in Loita community forest are represented in all size classes (reversed j-shaped distribution). Some of the common commercial species tend to be found only in large diameter classes and this was confirmed by this study. These include: *Podocarpus latifolius*, *Juniperus procera* and *Warbugia ugandensis*.

According to forest stocking, basal area based on sampled plots in this study was found to be $>80\text{m}^2\text{ha}^{-1}$ for the closed canopy forest in Korkoyo and Oloeni. A forest with basal area $> 70 \text{ m}^2\text{ha}^{-1}$ is usually classified to be in good conditions. It would take a while for the impact of forest degradation to be noticeable in Loita as the forest was still in very good condition with big trees, closed canopy and high regeneration. The impact though may be bigger as uncontrolled grazing, farming and settlement in the forest may limit regeneration. During this study, the forest had the same basal area of $80 \text{ m}^2\text{ha}^{-1}$ in Korkoyo and Oloeni which are areas with closed canopy forest with the basal area reducing to $31 \text{ m}^2\text{ha}^{-1}$ and $53 \text{ m}^2\text{ha}^{-1}$ in open canopy forest areas of Oloosoyian, the area around the swamp, and Entasikira which were under increased settlement, farming and urbanization respectively.

Table 4.12: Ecological characteristics of Loita forest

Forest site	Oloosoyian	Swamp	Korkoyo	Entasikira	Kirtilikini	Mausa	Oloeni	LSD	P value
BA/ha (m ² ha ⁻¹)	31.32±1.7	52.1±1.4	80.87±1.7	52.06±1.1	68.07±1.6	53.32±1.8	80.76±2.0	54.11	0.460
Stems per Hectare	1154±149.2	1312±146.7	1262±72.5	1193±94.0	1453±167.7	1580± 301.4	1131±98.6	509.5	0.538
Saplings/ha	8981±3126.0	2947± 343.2	8181±4054.0	2255±477.2	2996±699.8	2760±433.7	4176±1657.0	3786	0.002
Seedlings/ha	8012± 1856.0	9562± 1274.0	11186± 3114.0	6129±625.1	8866±1432.0	14204± 2726.0	9041±2951.0	5342	0.014
Diversity (H')	3.2±0.02	2.9±0.02	3.4±0.03	3.8±0.03	3.2±0.01	3.1±0.02	3.0±0.16	0.1881	0.001
Height (m)	9.4±0.6	20.5±1.3	10±1.0	9.0±0.4	13.0±1.3	16.8±1.5	10.9±0.8	2.89	0.001
DBH(cm)	14.4±1.4	16.8±1.7	15.6±2.8	14.3±1.2	11.59±1.3	14.5±1.5	15.1±1.8	2.43	0.44

The forest was highly disturbed in Entasikira, Swamp (Empupurtia), and Oloosoyian based on seedling density and basal area. Entasikira is adjacent to the largest urban settlement in the community regime while the swamp is the fastest growing settlement and farming area inside the forest. Korkoyo, Oloeni and Kirtilikini were the least disturbed as they are not settled but they are only affected by grazing and occasional timber and pole cutting.

4.4.2.2 Vegetative Change Analysis for Government and PFM Regimes

In the PFM regime (KFR), the primary forest in Isecheno had the highest basal area ($82.18 \text{ m}^2 \text{ ha}^{-1}$) compared to Ikuywa ($30.71 \text{ m}^2 \text{ ha}^{-1}$). This is because in Isecheno primary forest, there exist huge relic trees with big diameters while in Ikuywa which is far away from the forest station, all big diameter trees have been cut/poached through illegal activities as it is less policed. Bleher et al. (2006) showed that the highest logging levels occur mostly in the southern part of the forest like at Ikuywa as well as along the western edge mainly at Ileho area which also happens to have low basal area of $22.19 \text{ m}^2 \text{ ha}^{-1}$.

The forest has been under increasing pressure to provide products to the increasing population. Kuria, Mutange, Musiega and Muriuki (2011) noted that there was enormous destruction of Kakamega forest over the period between 1986 and 1995, but the forest recovered substantially over the period between 1995 and 2005. The forest recovery was attributed to reduced agricultural activities in the forest, projects supporting tree planting, empowerment of local people through community-based environmental protection approaches and increased forest plantations. Further, Fashing, Forrestel, Scully and Cords (2004) showed that stem density (for trees with a DBH of $\geq 2.5\text{cm}$) increased from 378.3 SPH in 1981 to 414.0 Stems Per Hectare

(SPH) in 1999, while this study showed that SPH in 2012 was 715 for primary forest in Isecheno section of KFR under the PFM regime; an increase of 72.7% which is significant (Table 4.13), an indication that the forest condition has been improving due to involvement (decentralizing governance) of local communities in forest management and better forest management (Kuria et al. 2011).

Table 4.13: Ecological characteristics of Kakamega forest reserve (PFM regime)

Attribute	Chelovani (P)	Ikuywa (P)	Ileho (S)	Lirhandanda (P)	Isecheno (P)	Isecheno (S)	LSD	P value
BA/ha(m ² ha ⁻¹)	37.81±0.5	30.71±1.1	22.19±0.5	49.62±2.1	82.18±1.8	46.28±1.3	2.8	0.001
SPH	2175±177.5	1158±145.0	1258±205.0	558±205.0	715±91.7	1000±158.8	481.9	0.001
Saplings/ha	1391± 348.6	2056±827.8	4203± 1927	2037±449.8	2395±183.1	1708±430.6	2644	0.343
Seedlings/ha	1325±231.4	2050± 351.9	2000±491.4	1464±219.1	2330±167.4	2181± 572.0	1597	0.767
Diversity (H')	3.6±0.006	3.6±0.012	2.7± 0.012	2.6±0.009	3.5±0.035	2.9±0.029	0.06	0.001
Height (m)	7.8±0.5	8.9±0.7	12.1±1.0	17.6±2.4	13.6±0.7	9.9±0.8	0.028	0.001
DBH(cm)	10.7±1.0	12.6±1.4	12.6±1.4	23.3±3.4	25.1±1.7	16.9±1.9	5.94	0.001

At the government regime site, all forest attributes (except stem density) were significantly different (t-test, 95% confidence level) between primary and secondary forest (Table 4.14).

Table 4.14: Ecological characteristics of Kakamega forest reserve (Government regime)

Attribute	Buyangu (Primary)	Buyangu (Secondary)	t – statistic	P value
BA/ha(m ² ha ⁻¹)	31.32±9.28	31.60±2.61	2.27	0.264
Stems per hectare	799±0.0	310±0.0	10.86	0.001
Saplings/ha	2540±394	1679±117	12.1	0.001
Seedlings/ha	2018±418	1500±146	8.48	0.001
Diversity (H')	3.2±0	2.9±0	20.33	0.031
Height (m)	9.6±0.4	12.2±0.4	46.8	0.001
DBH(cm)	10.9±0.7	9.5±0.2	37.18	0.001

High regeneration was witnessed in the primary zone of Isecheno forest due to better protection and availability of mature seed trees. In Chelovani, low regeneration was witnessed due to grazing and cutting of seed trees. Diameter class distribution in the PFM regime forests and where the forests sections are far away from the forest station demonstrated a reversed exponential curve having more trees of lower diameter size class. This was an indication that although large diameter class trees were being cut, the relic tree seeds encouraged regeneration. The forest section near the station in Isecheno and Lirhanda (Figures 4.13a to 4.13d) had trees with diameter over 70 cm and had a normal distribution of “inverse J” curve. Considering that Fashing et al. (2004) found the same distribution in 1981 and 1999, this suggests that the forest has maintained a size class distribution of a natural rainforest over 33 years in areas/blocks with little or no disturbance.

The forest area near the Isecheno forest station in the PFM regime was perceived by households to have closed forest canopy indicating low disturbance. This concurs with the ecological results of this study which show that Isecheno primary section of the forest had a stand density of 715 Stems Per Hectare (SPH) for trees with a DBH of ≥ 2.5 cm against a low SPH of 285 in Chelovani forest zone which is the farthest from the forest station. This suggests that PFM management was most effective closest to the forest station as was found by Lund et al. (2015) in Tanzania, where forest disturbance reduced in forest area near the village while forest disturbance increased in more remote parts of Mfyome forest, and also in Uganda (Banana et al., 1999). In the community regime, though the forest still had a closed canopy it was being opened up in forest areas near settlements leading to degradation. This study therefore affirms the call by Muller and Mburu (2009) that managers should give increased protection attention to areas far away from the station and forest edges.

In the PFM regime, there was an indication that large diameter class trees were being cut and the forest was regenerating. The forest section near the Isecheno station and Lirhandu had trees with diameter over 70 cm and a normal “inverse J” curve distribution. Considering that Fashing et al. (2004) found the same distribution in 1981 and 1999, this was an indication that the forest had maintained a diameter size class distribution expected of a natural rainforest over 33 years in areas/blocks with little or no disturbance. This suggests that the forest condition had not been significantly affected by the intense population pressure (Fashing et al., 2004). This was an indication that the conservation efforts, especially of PFM, have been effective. This study showed the forest area under PFM had the highest basal area and DBH. Kuria et al. (2011) attributed better conservation in Kakamega forest to the work done through several projects initiated in the region to enhance forest conservation in line with government policy of improving community livelihoods and forest management through participatory approaches.

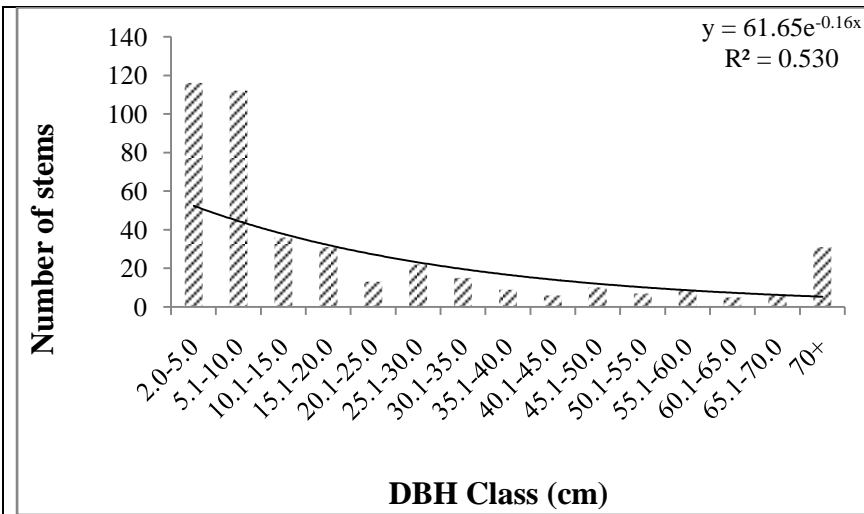


Figure 4.13a: Diameter class distribution in Isecheno (Primary)

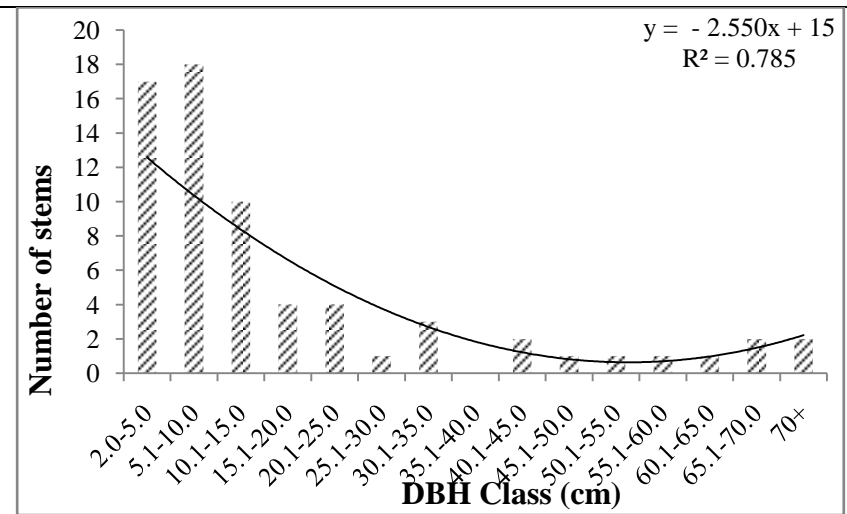


Figure 4.13b: Diameter class distribution in Lirhanda (Primary)

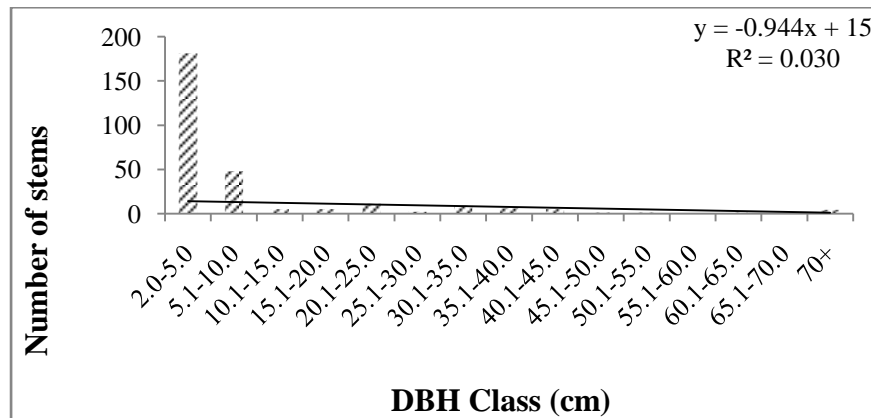


Figure 4.13c: Diameter class distribution in Ikuywa (Primary)

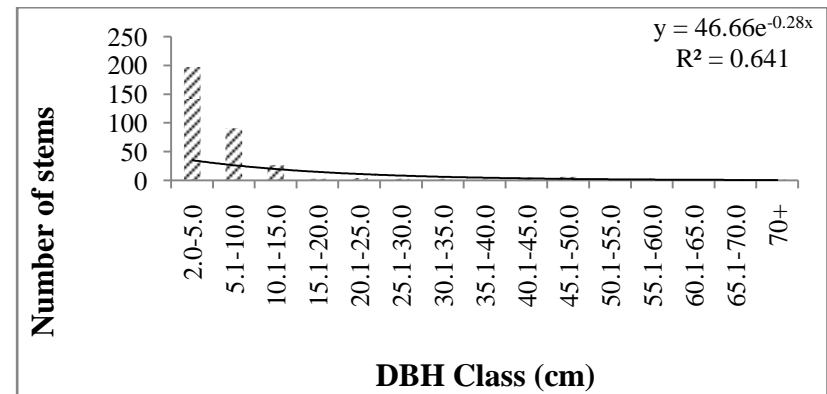


Figure 4.13b: Diameter class distribution in Chelovani (Primary)

*The above figures shows diameter class distribution of Kakamega forest reserve (Isecheno forest reserve)

4.4.3 Household Perception of Changes in Forest Condition (Size and Quality) between 1990 and 2010

4.4.3.1 Household Perception on Forest Conservation Status

The vast majority of respondents stated that better forest conservation is important for the community. The proportions were particularly high in the PFM regime (94%) and the government regime (96%), while the lower figure (63%) in the community regime. The low importance by the households in the community regime may have been in part caused by inclusion in the sample of households that do not reside in the forest and are not directly benefiting from the forest, the different priorities of the Loitans on the forest and increasing settlement in the forest.

The household respondents indicated that there was change in forest size over time with the opinions of respondents at the three sites being significantly different ($\chi^2 = 27.614$, $p < 0.001$). Respondents in the PFM regime and the government regime felt that the forest size had reduced significantly with 52% and 51.6% indicating that the forest size has reduced respectively. In the community regime, only 14.8% were of the opinion that the size had reduced. Interestingly, when asked about forest condition, the majority of respondents in all three sites (52% in the PFM regime, 65% in the community regime and 67% in the government regime) perceived that the forest condition was better in 2011 than in the year 2000. Regarding forest condition prior to 2000, the households in all the regimes felt that the forest condition was generally good but 75% of households in the community regime perceived that it was good (Figure 4.14). A very good forest condition was only indicated in the government regime, while the PFM site had the largest number of households indicating a poor condition.

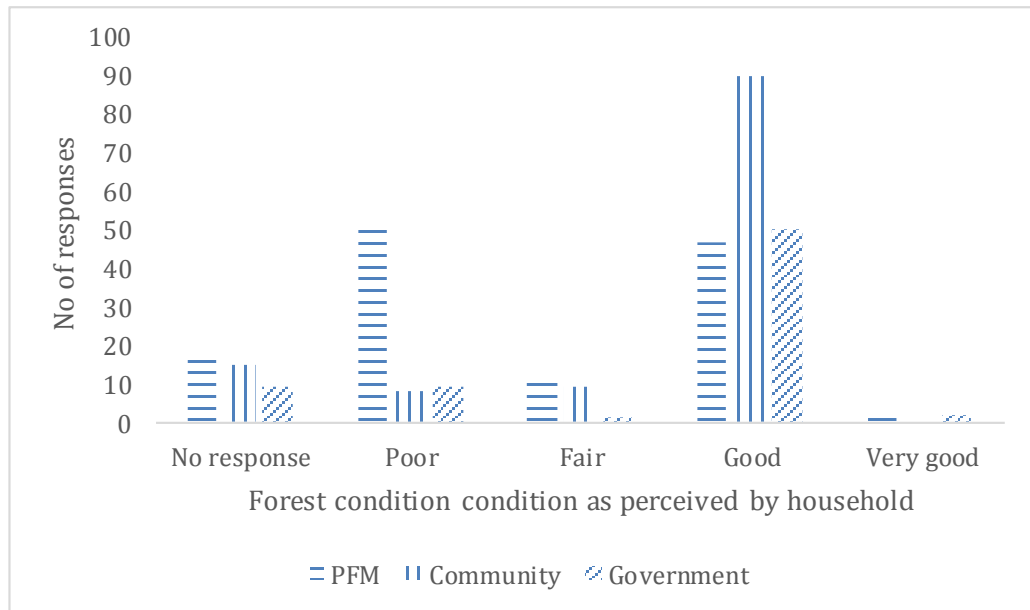


Figure 4.14: Forest condition before the year 2000 according to household respondents' perception

4.4.3.2 Households Satisfaction Level With Conservation

The households' level of satisfaction with level of conservation was uniform across the three study sites; community (65%), government (65%) and PFM regimes (63%). Households in the PFM and the community regimes indicated satisfied and very satisfied rank higher than the government regime (Figure 4.15). However, there was some variation within sites. In the community site, for example, satisfaction levels were lowest in Ilmaral, a settlement about 5 km from the edge of the forest, because the forest does not provide direct benefits except grazing. The perceived low satisfaction was because the respondents paid (incurred a cost) a fee to individuals whom they hired to harvest and transport forest products from the forest to their homes. Satisfaction was highest in Empupurtia which could be attributable to free access to land and forest products. In the PFM regime, the level of satisfaction was lowest in Ikuywa and Ileho where PFM was just starting. However, there was a group

that remained dissatisfied in all three governance regimes, suggesting that not everybody's needs are sufficiently addressed.

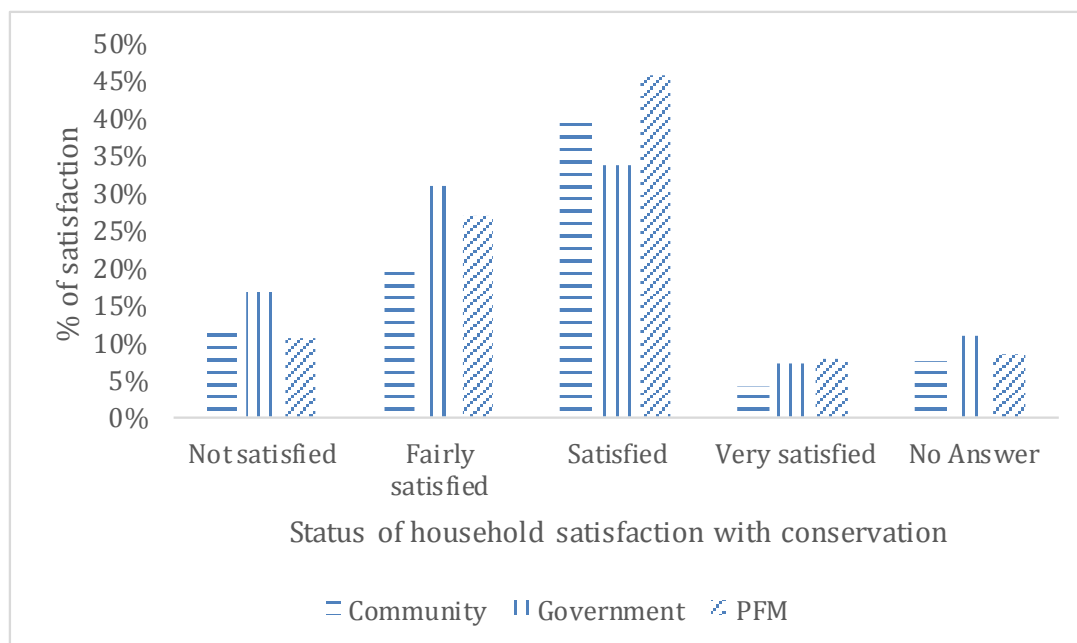


Figure 4.15: Household level of satisfaction with forest conservation status at each site (N 323)

The majority (66.7%) of households in the community regime indicated that they felt they got a fair deal from the governance regime, but the proportion declined in the PFM (51.8%) and the government (33.8%) regimes. The three most important reasons given across all the three regimes for the feeling were sustainable access to resources (with some respondents particularly mentioning that future generations would be able to access the same resources), community involvement in forest management and conservation, and employment. A small number in the government site also mentioned that the forest attracts rainfall while a few of the PFM site respondents mentioned availability of seedlings.

Forest degradation was highlighted to be contributing negatively to communities accessing “a fair deal” from the forest in the community regime, an indication that the

community would like to see degradation minimized. The households at the three sites suggested having more community involvement in the management and conservation of the forest and motivating communities when they are involved in forest activities (PFM 95%; community 100% and government 97%) as the means to make the deal from the forest fairer for the benefit of both local communities and government and balance conservation with economic development.

For those households who felt they were not getting a fair deal, the reasons given were slightly different by regime. In the community regime, the respondents stated there were not enough benefits from the forest because of extensive forest destruction. In the government regime lack of community involvement, no benefit-sharing between communities, managers and limited access to resources were given as the main reasons, but a small proportion also mentioned lack of compensation for any loss caused by wild animals and problems with corruption. The main factor mentioned in the PFM regime was insufficient community involvement with a small proportion of people mentioning corruption, restricted access to resources, insufficient benefit-sharing, high permit fees and tribalism during employment.

The households in all sites indicated that they were getting a fair deal from the forest management regime. The community regime had the highest feeling of fair deal attributed to community management which provides equal opportunity to all communities/households and equally exclude others. Getting a fairer deal from the forest management regime was contributing to sustainable management of the forest. This was in conformity with the argument by Ostrom (2009) that when expected benefits of managing a resource exceed the perceived costs of investing in better rules and norms for most users and their leaders, the probability of users self-organizing is high. This was also confirmed during FGD and KI discussion in Loita (community

regime) where there were several organisations involved in the management of Loita forest and forest protection committees had developed rules for managing their section of the forest.

Andersson (2006) indicated that the satisfaction rating is used as a proxy for governance success. Levels of satisfaction varied among different stakeholders: high for KFS as it was handing over (meeting its objective for decentralizing) roles like patrolling and fee collection to CFAs (Chomba et al., 2015; GoK, 2016a). The low satisfaction rating by CSO may be attributed to inadequate livelihoods accessible to communities, government accessing all the benefits and the communities being forced to charge members additional charges above the set fee charges as mean to compensate their participation (Chomba et al., 2015). Kenya Wildlife Service low rating was due to inadequate decentralization and failure to adequately compensate communities for their efforts.

In the community regime, 55% of the households felt the forest was better conserved, but in Olorte area, only 26% were in concurrence. This is an area outside the Loita forest and the households have shifted to settled agriculture (including irrigated fields) and use the forest for all their forest product needs leading to over utilization of the forest. Focus Group Discussion participants and key informants indicated that the forest is the zone with trees; and glades in the forest are not considered forests. This was a “community re-classification” of forest to avoid being blamed for causing forest degradation and support their position that the forest area has not changed. The forest is under overlapping authority and ownership where the whole forest area is under the authority of the Oloibon, but households have exclusive control of forest areas adjacent to their homesteads. They do not require permission from the Oloibon or the forest committee to use or even lease “their” portions. The households view the

forest under community (Oloibon) control to be the forest area where there is no settlement and which is still intact.

The reduction in forest area in the community regime reflects what Kiyiapi (1999) predicted, that the community cannot simply argue that the forest has been well conserved in the past and therefore this will continue into the future: it will not because of changes in critical socio-economic variables among the Loita Maasai and indeed in the case for the rest of Maasai land. Further, Kiyiapi (1999) advised the community to take more aggressive steps to safeguard their natural resources in the current socio-economic and political transformation. Kiyiapi (1999) argued that core forest areas should be maintained and Olng'arua swamp (Empupurtia) should be included in the protection. This study found that the swamp was attracting the fastest settlement by households and all forest areas were under farming or grazing and there was no core forest area as grazing, timber cutting and farming was being done in the entire forest.

Those respondents, who felt that the forest condition was worse prior to 2000, mentioned a range of causes. Illegal harvesting was cited to be a reason for worse forest conservation in the community regime. Inadequate personnel were cited at both government and PFM regimes, as they rely on employed government staff to manage the forest, and not in the community regime where volunteers are involved in forest conservation (Figure 4.16). Population increase was indicated by households to be a major reason for worse forest conservation in the community regime. This could be attributed to settlement in the forest. Corruption as a cause of worse forest condition in the government regime.

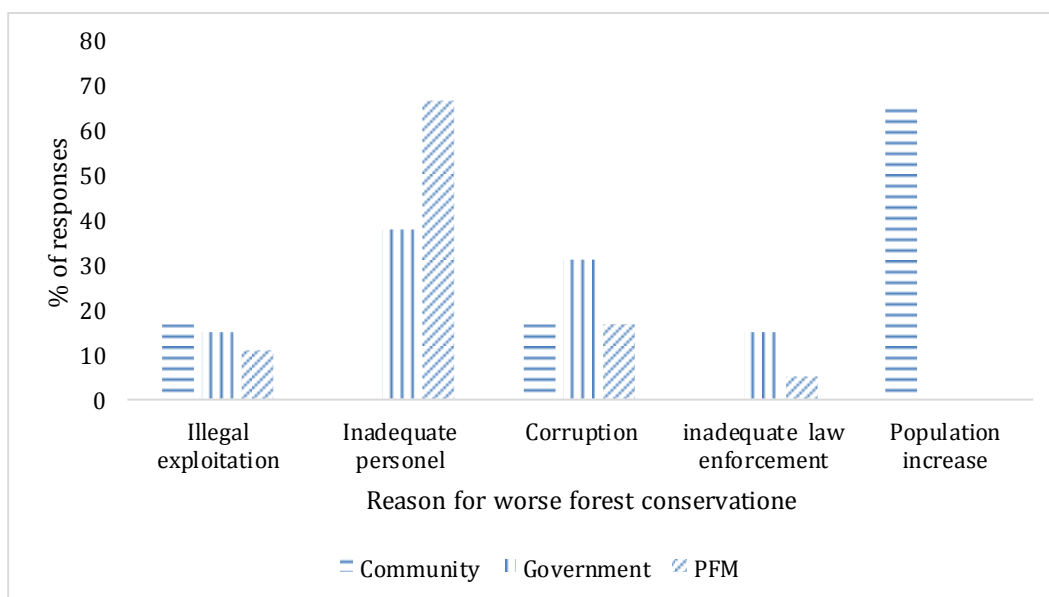


Figure 4.16: Household respondents’ reasons for worse forest conservation in 2000

The laws in Kenya may not fully facilitate better conservation as they lack provision for compensating CFAs in the case of cancellation of the agreements by government, referred to as extinguishability by RRI (2012). This may affect long-term commitment and investment in forestry management. In Nepal, Mozambique, Vietnam, Tanzania and Laos, the communities are entitled to a just compensation if their rights are taken away or restricted (Katila, 2008). This was an indication that decentralization has not fully started contributing to forestry management effectively and the benefits are yet to be fully actualized if the success of PFM is measured by benefits accruing to the participating communities (Lawrence, 2007). It should be appreciated that usufruct rights are transferred to CFAs after signing forest management agreements with KFS while recognizing that the forest station multi-stakeholder committee should have a role over forest management issues at the station level. The absence of costs and benefits regulations has continued to slow down access of benefits.

4.4.3.3 Household Perceptions of Factors Leading to Better Forest Condition in 2011 than 2000

Respondents (63%) felt that forest condition had improved from 2000 to 2011 across the three regimes. In the government and the PFM regime, this improvement was attributed to strict rules and regulations and community involvement in forest management (Figure 4.17) indicating that communities are providing the required extra capacity leading to better managed forests in the PFM regime. Conservation awareness was considered important in the community and the PFM regimes but mentioned by very few (4 respondents) in the government regime. Adequate personnel and closed canopy were both considered of lesser importance by the PFM regime, the community and the government regimes households. The high awareness in the community regime would be attributed to the Loita Maasai view the rangelands and the forest as one unit. Loitans believe that adjudication of their land would jeopardize their survival strategies since the forest and the open rangelands are complementary and hence could only be more beneficial when utilized as one ecosystem and has had little or no degradation (Karanja et al., 2002; MPIDO, 2005, as cited in Miner, 2011).

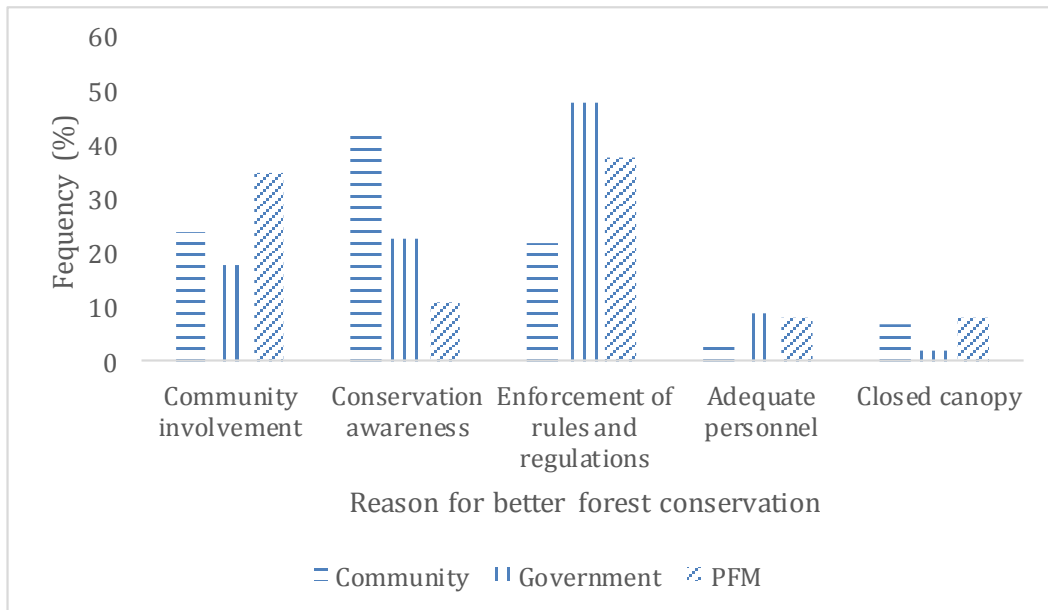


Figure 4.17: Reasons why forest was in better condition in 2011 than 2000

This study found that the desire of Loita Maasai pastoralists to retain their ancestral land intact and to religiously conserve and preserve their environment as a whole mainly due to their cultural solidarity and awareness as noted by Karbolo (2000) was under threat. Though there was evidence of daily or weekly meetings on forest management, the community was not managing to cope with the pressures to over-exploit the forest (in some cases by local elites). The area has been declared an adjudication area that would lead to individual land holding title deeds hence negating all community efforts and likely signalling the start of a new and possibly more rapid phase of Loita forest degradation. The findings of this study appear to contradict findings by Karbolo (2000), which suggested that the Loita Maasai community believe in maintaining and sustaining a communal way of life where community members live in harmony, are mutually supportive and inter-dependent in the realization of general life tasks.

The imposition of modern conservation rules, land use changes, lost territory and the individualization of risk have led to a sense of vulnerability among the Maasai

(Miner, 2011). This has forced them to manage the forest collectively ensuring that the forest has remained in good conditions as the local community managed and assumed that they owned the forest (Karanja et al., 2002). Legally, the Loita community only has *de facto* rights over the forest resource; however, the long-term exercising of the expanded bundle of rights by the community has slowly evolved to be much closer to the *de jure* system described by Schlager and Ostrom (1992) and RRI (2012). This has ensured that the community guards the forest against agents of deforestation and protects the forest against degradation, and guards community cohesiveness which has ensured that the communities collectively have resisted government policies like gazetting the forest into a national reserve as it would displace them from their land.

The community in Loita hold the rights of management, have the authority to determine how, when and where harvesting from the forest may occur and whether and how the structure of the forest may be changed. Further, Loita forest has survived this far because, in line with principles outlined by Ostrom (2009), the community face lower transaction costs as well as lower costs in defending a resource against invasion, have well socially knit monitoring and enforcement and they cannot be overruled by larger government policies. Accessing these rights by the Loitans has acted as an incentive to undertake long-term investment in the forest.

The households in Loita indicated that the forest was not well managed due to grazing and farming. This confirmed the study by Riamit (2011) who indicated that the simple and small huts are evolving to more complex and large “modern houses” that was pushing up the demand for timber. This change was contributing to degradation in the community regime. Moreover, Christianity was also perceived to have impacted negatively on the powers of the Oloibon (Riamit, 2011) affecting the overall

management of the community regime. The introduction of carpentry training at Ikerin centre will introduce local furniture making with possible negative impacts on the forest. This calls for better governance supported by technical input and planning for sustainable forest management.

The households indicated there was a great variation on forest condition among the sites (Figure 4.18) between 2000 and 2010. Closed canopy was the most important indicator of forest condition mentioned in all sites. The community in the community regime perceived that the canopy was getting open as the majority (92%) of households perceived that the forest canopy was closed in 2000 but this declined to 64% in 2010. The forest condition was perceived to have remained the same in that period by respondents in the government regime. In the PFM regime, only half the respondents described the forest as having a closed canopy with almost as many describing it as having an open canopy, with a slight decline in both during the study period.

In Loita over the 1990-2010 period the households did recognise a trend towards increasing canopy openness and more tree cutting. However, in Kakamega, indicated changes in forest quality varied by locations, with the government regime and the area close to the Isecheno forest station in the PFM site being viewed to have changed positively. The generally positive outlook in the government regime forest may be explained by the fact that this area was under total protection, with no extractive use permitted. In contrast, the community regime was facing unprecedented utilization through settlement and logging. This was exacerbated by weakening of the Oloibon and lack of partnership with KFS and County Government to provide support through technical, financial and human support including rangers and community forest scouts.

Communities in Olorte under the community regime during FGD and KI discussions indicated that good forest policy could militate against poor forest condition. This was stated, by the Oloibon during KI discussion in his homestead. This was an indication that the community were appreciating that government intervention was necessary and the community would wish to have national government participation in the management of Loita community forest. This erosion of local resource ownership and control is likely to intensify in the context of wider economic policies and legal reforms supporting the penetration of corporate activity through tourism and government through partnership circumscribing community rights over the resource (German, Mandondo, Paumgarten & Mwita, 2014).

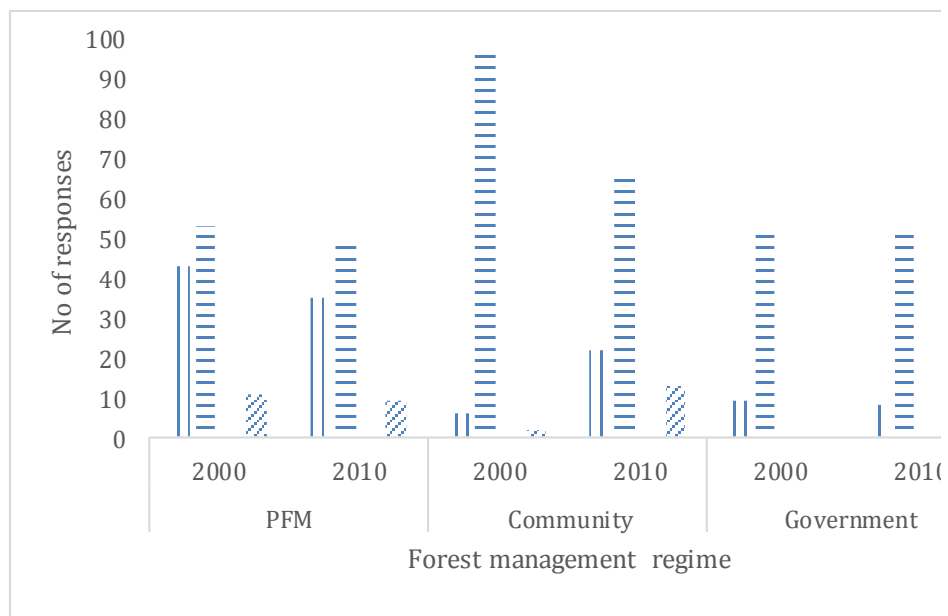


Figure 4.18: Household perceptions on prevalence of forest condition indicators in 2000 and 2010

“Cutting of trees” as an indicator for determining forest condition was not mentioned in the government regime as it is not allowed. Although a small proportion of respondents mentioned it in the PFM regime, it was occurring at lower levels in 2010 than in 2000, an indication of declining forest degradation and improved protection.

However, in the community regime, 10.3% of the respondents mentioned that “cutting of trees” was more prevalent in 2010 than in 2000. Trees were being cut to provide timber and space for agriculture suggesting that deforestation and degradation were high. Focus group discussion indicated that timber for sale to other parts of the country from the community regime (Loita forest) coupled with increased unprecedented settlement in the forest posed threat to the forest.

Focus group discussion and key informants explained that this particularly related to officials allowing illegal pole and timber cutting and unauthorized grazing in the forest at a fee. The “cutting of trees”, was a factor indicated to contribute to a decline in forest condition in the community and the PFM regimes but not in the government regime, suggesting enforcement of laws was more effective in the government regime. Households in the community regime are getting alarmed by deteriorating forest condition due to increased tree cutting for local and external use and opening up of forest area for human settlement and farming. This perception concurs with the opinion expressed by Kenea (2008), that despite the fact that human beings require biodiversity services for their survival, rural households are increasingly forced to overharvest forest resources because they lack alternative livelihood options.

This study has shown that forest condition in terms of extent (size) was declining in both Loita and Kakamega. Analysis of remotely sensed data showed that both Loita and Kakamega forests declined in size, becoming increasingly fragmented over the 1990-2010 period. However, in the Loita case, most respondents did not view a decrease in size. In the Kakamega case, just over half the respondents in both the PFM and the government felt that the forest size was declining.

It may be too early in the implementation of decentralization to claim that it is contributing to better forest quality, as was witnessed in the PFM regime compared to

the general declining forest condition for Kakamega forest. Globally, the findings are mixed (Lund et al., 2015; Goswami, Mariappan, Singh & Ganesh, 2016; Pelletier, Gelinas & Skutsch, 2016). In Madagascar (Rasolofoson, Ferraro, Jenkins & Jones, 2015) decentralization of forest management to local communities has not, on average, achieved its forest conservation goal. In Kenya, the loss in the community regime could be attributed to various factors with increase in population being the major reason while in the PFM regime, it could be as a result of low level awareness on biodiversity.

4.5 Impacts of Forest Governance Regime on Household Livelihoods

This section provides evidence on Research Question 3 and presents results related to the extent to which different forest management regimes have impacted on household livelihoods. The first sub-section presents data on the overall income of households at the different sites and the proportion of that income that respondents attribute to the forest. This is followed by a more detailed exploration of the types of benefits people obtain from the forest and how each of these has changed over time.

4.5.1 Household Livelihood Sources and Implications on Forest Management

The main household livelihood sources in 2011 in Loita and Kakamega included agriculture, forest products, livestock keeping, bee keeping, tree nursery, borrowing between households, loans from finance institutions, fishing, business, formal/salaried employment, and remittances. The average incomes (Table 4.15) across the three forms of forest management were significantly different for a few income sources including: agriculture (F=3.935, p=0.02); forest products (F=4.789, p=0.009); remittance (F=4.472, p=0.012) and livestock (F=9.307, p<0.001).

Table 4.15: Average household income under different forms of management in 2011

Form of management	Agriculture	Forest products	Remittance	Borrowing	Loans	Salary	Business	Bee keeping	Tree nursery	Livestock
PFM	93534.50	19860.53	10953.22	1705.88	6883.04	5614.04	3241.18	1076.02	1643.27	.00
Government	127633.96	18558.79	12667.03	4396.92	9467.03	20714.29	2287.91	.00	1428.57	.00
Community	65902.95	55246.72	1704.92	8573.77	1311.48	98.36	.00	.00	.00	3524.59

Forest products, bee keeping, tree nursery, borrowing, loans, fishing, business, formal/salaried employment, and remittances were generally of lesser importance and exhibited no significant variations between the sites. Income from agriculture was indicated to be better in 2011 than 1990 in all sites, with a marked improvement in the community regime (especially Empupurtia, Nkpon and Ilmaral) except for one site (Ilkerin) where the soil is not suitable for crop growing. Improved income from agriculture in the community regime was attributed to clearing forest to open up land for farming. The forest products condition was better in 2011 than 1990 in the community regime apart from Nkpon and Ilkerin whose forest products condition was perceived to be worse. In both the PFM and the government regimes, forest products were perceived to be better in 2011 than in 1990.

Livestock was not indicated as a livelihood source across the study sites except by a few farmers in Loita especially in Nkpon area where it was mentioned as a major occupation by the respondents., Remittances were better in Nkpon and Ilkerin in the community regime but were not indicated as a household livelihood income source in Empupurtia in 1990 and 2011. From a study site perception, remittances were better in all three regimes, an indication that all the regimes had members working outside sending money back to the village. Remittance, as an alternative livelihood sources

may contribute positively to forest conservation as it would be an alternative income source.

Borrowing between households was hardly a source of livelihood in most of the sites but was more valuable in the government regime where cash from sugarcane was available for borrowing and Nkapon in community regime. Loans were not considered a household livelihood source in Nkapon, Empupurtia and Ilmaral in the community regime but they were a negligible livelihood source in the other regimes. In the government regime, the adjacent communities were accessing loans more than in the other sites around Kakamega forest, which could possibly be attributed to loans given by sugar milling companies to farmers.

Only very few households PFM regime, government regime and community regime(20, 14 and 7 respondents respectively) relied on formal/ salaried employment as a source of income. Household involvement in business was very low with some sites indicating a worse scenario and a very small percentage indicating better in the government and the PFM regimes and none in the community regime, where the majority indicated business was not a household livelihood source of income. Bee keeping was not practiced as an income livelihood source in any of the sites except in the PFM regime at Virhembe zone where it was introduced through PFM. This was also the site that reported income from tree nurseries.

Studies (World Bank, 2009; Manandhar & Shin, 2013; Wunder, Borner, Shively & Wyman 2014) have shown that forests are also an important reserve to which people can turn to in times of hardships and have potential to improve livelihoods. The Forest Conservation and Management Act, 2016 explicitly provides for subsistence and commercial use of forests like timber exploitation (GoK, 2016a) to improve local livelihoods. This provides an opportunity for wealth creation for community in Kenya

through PFM which allow access beyond subsistence. This would help communities out of poverty as Katila (2008) indicated that subsistence use of forest cannot create wealth for communities. Further, Katila (2008) observed that decentralization improves livelihoods, and that devolution of forest related rights and responsibilities to the local level, has become one of the main avenues towards sustainable forest management, rural development and poverty reduction.

The key livelihood sources in all the sites were; agriculture (PELIS in Kakamega and crop farming in Loita), forest products, livestock keeping and beekeeping. Minimal contribution from loans, business, salaried employment and remittance may be a pointer to household overreliance on the forest. This calls for provision of alternative non-forest based livelihood sources as a means to support better forest conservation like Arabuko Sokoke forest (Mbuvi and Musyoki, 2013) through provision of income and replacing extractive forest-based activities like firewood collection.

4.5.2 Forest Products Contribution to Household Livelihoods

Forest was the main source of most household livelihood products in the three study regimes. The forest was contributing 75% of household firewood needs for government regime respondents, 51% of household construction material for households in the community regime and was contributing to 39% of household food as perceived by respondents in the PFM regime mainly through PELIS (Figure 4.19). The forest was surprisingly perceived to contribute very lowly to livestock grazing in Loita community regime. This was explained by the KI and FGD who clarified that, although the forest area is used as emergency grazing area during drought, they did not associate grazing with income from the forest. Furthermore, they distinctly

differentiated the forest (*Entim*), where there was minimal grazing, from the glades (grasslands in the forest) where they graze.

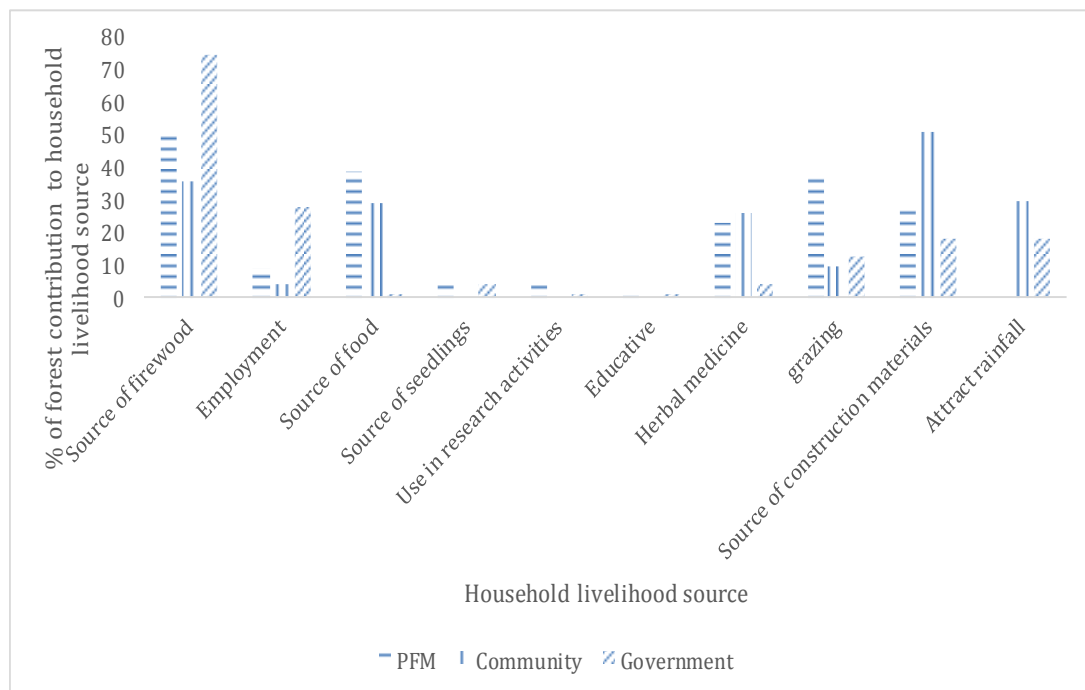


Figure 4.19: Forest contribution to household livelihoods in 2011 (N=323)

4.5.3 Trend Analysis of Household Access to Forest Products

Most (64%) of the household respondents did not indicate the trend of food crop sales as a source of income since 1990 while a few in Virhembe, Ileho and Entasikira indicated that the trend was increasing. In Virhembe and Ileho (PFM regime), this could be attributed to PELIS which has been active as KFS replants cleared areas, while for Entasikira (community regime), the increase was attributed to farming inside the forest. About 15% of the households in Loita indicated that food sales were increasing, while 23% of households in the PFM regime indicated that the trend was decreasing because of a reduction in area under PELIS. Likewise, most of the households did not indicate the trend of seedlings since 1990. A few people in Virhembe, Ikuywa and Ileho indicated that the trend was increasing owing to increased projects supporting tree planting like Kakamega Environmental Education

Programme (KEEP), KFS, Carbon markets and Community Development Trust Fund (CDTF). Herbal medicine trend was not indicated by most households since 1990. However, a few household respondents in the PFM regime (14%) and Loita (1%) indicated that the trend was decreasing. The trend on research since 1990 was not indicated by households except one household in the PFM regime indicating an increasing trend. This was due to increased research activities and projects being implemented in the PFM regime.

Trend for grazing pasture was not indicated by many from 1990 however, some respondents in the PFM and the community regimes indicated that the trend was decreasing. Fragmentation analysis showed reducing area under grass associated to reforestation in Kakamega and grazing of sheep in LCF. Rainfall was considered by the households as a major contributor to household income because of the central role it plays to the households' income. The majority (299 responses) of households did not comment on changes in rainfall since 1990, except for a few in Loita who indicated either a constant (8 responses) or increasing (1 response) trend. Given that FGD indicated the Loita communities had only settled in the forest in the last 20 years, they may not have had a clear perception on rainfall change over time.

Most of the household respondents did not indicate the trend of construction materials (poles and timber) since 1990, but 15.22% and 6.73% of households in the community regime and the PFM regime respectively indicated that the trend was increasing. The increase in the PFM regime was for timber from logging in commercial exotic tree plantations as there is a ban on exploitation of indigenous forests since 1990. In the community regime, this was due to increased settlement in the forest and decreasing construction materials in the adjacent bush lands both leading to cutting of trees in the forest. The households perceived high use of

firewood almost across all sites but very high in the PFM regime. Loita community forest was perceived to be highly utilized for provision of construction materials which was mainly timber. Firewood use has been reducing negligibly (Table 4.16) over the twenty years across all the sites except in the government regime but was very high in the community regime. Charcoal use was reducing insignificantly in all sites between 1990 and 2011. The use of new sources of energy such as solar and electricity were first used in the PFM regime.

Table 4.16: Household sources of energy between 1990 and 2011 per study site (% response per site)

Source of Energy	PFM		Community		Government	
	1990	2011	1990	2011	1990	2011
Charcoal	21.67	21.33	12.33	12.67	24	23
Firewood	39	37.67	77.67	76	39	39
Gas (LPG)	3	3.67	0.17	0.33	3	4
Kerosene	32.33	30.67	9.83	11	34	33
Solar	3	4.33	0	0	0	1
Generator	0.33	0.33	0	0	0	0
Electricity	0.67	1.33	0	0	0	0
Briquettes	0	0.67	0	0	0	0

In the community regime, firewood remains a major source of energy with communities in Nkopon and Empupurtia relying on it wholly. Large centres like Ilkerin and Entasikira were also using gas and kerosene. In Kakamega (both PFM and government regime), the households were using less firewood as compared to the community regime. Charcoal was being used in all the regimes but Ilkerin was leading in the community regime. The area has the largest shopping centre and an institution with employed staff who can afford LPG.

Over-reliance on firewood in the community regime was likely to contribute to forest degradation. This was likely to be exacerbated by low uptake of alternative energy sources like cooking gas, solar and electricity mainly attributed to poor economic status of the communities. This status has been confirmed by the communities very low involvement in business and limited access to loans, an indication that the community may be poor. This further predisposes the communities to rely primarily on the forest for income resulting in forest degradation as confirmed during FGD and KI discussions. This conforms to the argument by Wunder et al. (2014) that low saving (as in Loita) exposes the forest further to utilization as forest resources often are more important in poverty stricken areas than savings or credit access.

The communities' over-reliance on the forest in the community regime was likely to remain high. The trend of key livelihood activities between 1990 and 2011 showed that communities living far away from the forest have degraded the nearby bush lands so as to get forest products; households had minimal access to loans, which would have kept the community off destructive forest activities. This was similar to formal/salaried employment which was not a common source of income for most forest adjacent households and those living in the forest in the case of the community regime. Lack of steady income may lead to the communities turning to the forest to secure their livelihoods. The FGD and KI in the community regime indicated that the households were moving into the forest as a last resort. They indicated that they are aware the consequences are not good and they may move out if supported with services like water. This is in line with the arguments by Wunder et al. (2014) that forests and other wildlands are "options of last resort, which people only select as their primary safety net response when shocks are particularly severe and when, due

to adverse household and village conditioning factors, they do not have any easier way out.

Beekeeping as an IGA could mitigate against overreliance on the forest but it was only being implemented in the PFM regime where it was not doing well as the communities were still learning the practice. Livestock keeping was doing well in the community regime whereas in the government and the PFM regime, only a few households keep a limited number of livestock due to small land sizes. The satellite images showed reducing grazing area, with FGD and KI discussions indicating that grazing area was reducing due to increasing sheep population which are less affected by diseases but degrade the area more than goat and cattle.

This study suggests that forests are likely to be degraded further owing to the households in all regimes relying on forest based energy sources. This study corroborates observations by Blacket (1994), as cited in Mitchell (2009), who reported that biodiversity degradation continues to be documented despite the multiple institutions in Kakamega. Further, the indigenous forest cover in Kakamega reduced from 23,785 hectares in 1933 to only 13,990 hectares in 1990. According to Bleher et al. (2006), illegal activities in Kakamega forest including logging, fuel-wood collection and extraction of bark for medicinal purposes was common and appear to be heterogeneous throughout the forest with some sites providing more protection than others (Fashing et al., 2004).

The community in Loita had a low value for grazing which could be attributed to free access to the forest making it hard to assign a monetary value. Loita forest was facing increasing heavy forest use, expanding agriculture and settlement in the forest as observed during the study. The area has a very small nursery in Olorte run by an NGO 'Walking with the Maasai', which supplies seedlings for planting in homesteads,

schools and campsites both for free and at a fee. Discussions with the nursery managers working for the NGO suggested there was very little tree-planting in homesteads and farms and minimal rehabilitation efforts in the forest.

In the community regime the forest products being accessed by households were likely to degrade the forest due to overgrazing and the lack of tree planting activities. This is likely to escalate considering that poverty was very high in areas around the forest further contributing to forest degradation. This was noted that protecting forest biodiversity requires an improvement of the household livelihoods security around forest (Kariuki, 2008). Livelihood security was noted by Kenea (1988) to be an urgent action in Kakamega where 88% of the households surrounding the forest depend on it for firewood, charcoal, grass, construction wood and herbal medicine both for household consumption and for sale. This study showed continued reliance of households on the forests for various products require to be properly managed to mitigate degradation.

The majority of the household respondents indicated an overall reduction in forest products access and use between 2000 and 2011. There was marked reduction in the products (firewood, grass and herbs) households were accessing from the forest in the PFM regime and the government regime between 2000 and 2011 (Figure 4.20). Firewood was a major product that households were accessing from the forest but as with the other forest products, its use was reducing by 2011 with some households turning to other sources as a result of control of access. Game meat was accessed in the government regime in 2000 but had been stopped by 2011 through effective control.

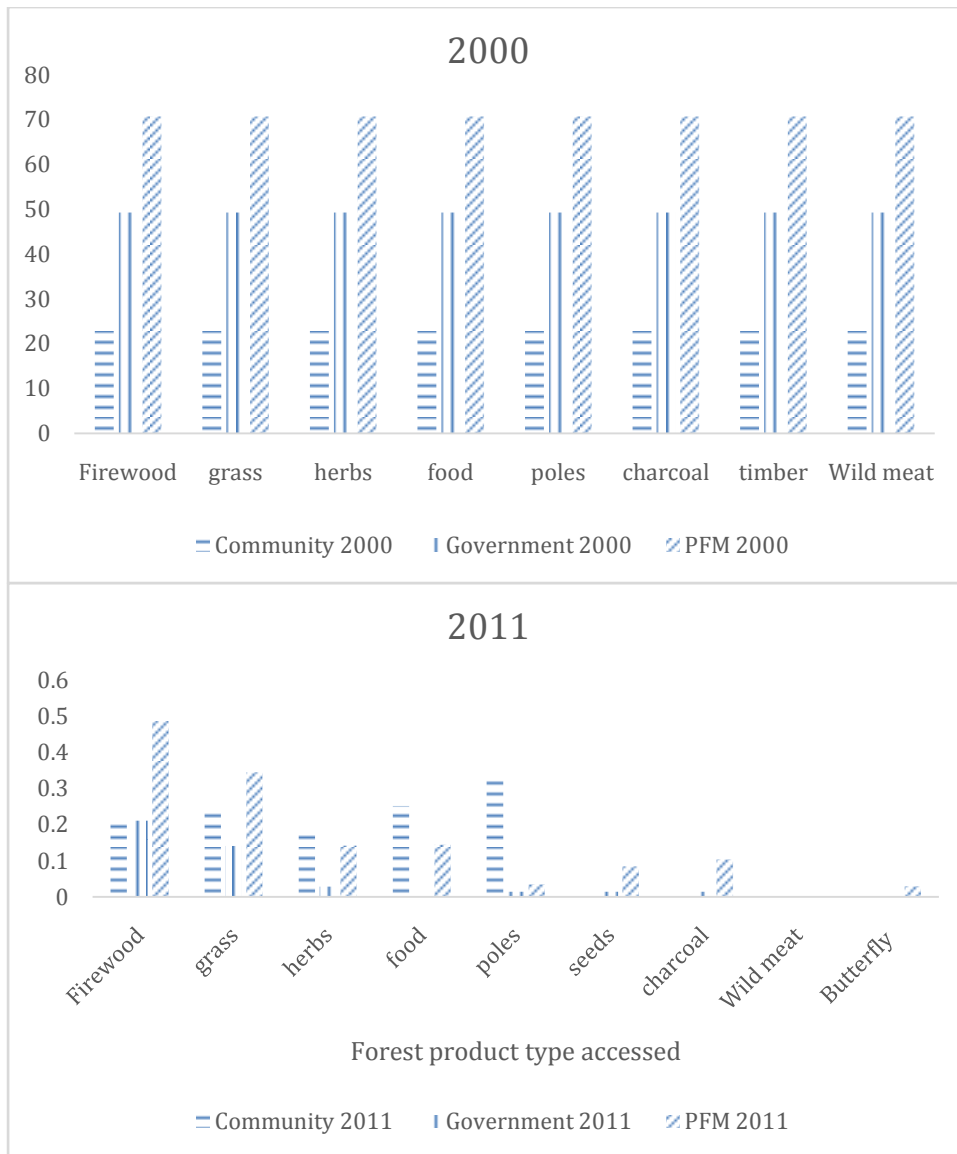


Figure 4.20: Change in household forest products access (illegal and legal) situation between 2000 and 2011

Domestic use of charcoal had been started in the community regime with timber use for commercial and domestic use also increasing. The FGDs indicated that cutting of timber in the community regime was likely to degrade the forest if not managed. A similar scenario was reported for pole extraction in the PFM regime. The households indicated that they were accessing firewood in the government regime but the access

had drastically reduced in 2011. This access was informal while access to other products is outlined in Table 4.17.

Table 4.17: Forest product access conditions under the three governance regimes

Products	Community	Government	PFM
Grass	Free access	Not allowed	Permit
Timber (logs)	Forest committee permission	Not allowed	Permit
Poles and withies	Free access	Not allowed	Permit
Nursery soil	Free access	Not allowed	Permit
Firewood	Free access	Not allowed	Permit
Wild meat	Free access	Not allowed	Permit
Butterfly	N/A	Not allowed	Permit (free)
Wildlings	Free access	Not allowed	Permit
Research	Free access	Permit	Permit
Seedlings	Free access	Not allowed	Royalties
Tourism	By agreement with Household	Permit	Permit
Herbs	Free access	Not allowed	Free access
Food products (like fruits and vegetables)	Free access	Not allowed	Free access

New forest uses were emerging like seeds collection and timber, charcoal and wild meat in the community regime. Game meat was indicated as a product whose trend was increasing in the community regime though its use had been stopped in the government regime. In the PFM regime, new incentives for conservation of forest biodiversity include; intellectual property rights on bio-prospecting, a carbon credits forest project and butterfly farming.

The intra-site variation of forest products access in the study sites is shown in Table 4.18 where in the PFM site the key differences are employment (higher at Virhembe). Ileho seems to make more use of the forest for firewood, honey, herbs and food than

Virhembe and Ikuywa. In the community regime, there is a difference in forest use between the sites. Empupurtia and Olorite are relying more on herbs and the forest as water catchment than other areas like Nkopon, Ilkerin and Ilmaral located away from the forest. The forest provides construction materials but firewood was the product most heavily accessed. Some households in Empupurtia, a settlement located inside the forest, assumed that the forest is part of their property and therefore did not consider access to some products like firewood as a forest benefit. Olorite considered firewood collected from the forest as a benefit. This was because the households in Olorite paid a fee to community members who collect firewood from the forest.

The households are accessing a variety of goods from the forest with firewood, food crops and construction materials being the most accessed in all the forests. The households in the government regime accessed firewood from the forest though illegally. This was observed during the ecological survey where no fallen firewood was observed and young women were encountered collecting firewood. The reasons indicated to contribute to the households varied access to forest products were; rights have been turned into privileges (43%), decentralization has not been fully implemented (29%) leading to partial community involvement and benefit sharing mechanisms that are not fully in place (28%). The goods and services with smallest mean value included tree seedlings, research and education. Employment as a service was very low in Loita community forest just as firewood. Interestingly, the households were accessing firewood in the government regime which was not allowed legally, an indication of informal access by communities and a pointer to weak governance.

Table 4.18: Proportion of households obtaining different benefit from the forest in 2011

	% Response per site									
	PFM			Community						Government
	Virhem be	Ikuy wa	Ileho	Entasiki ra	Empupur tia	Olor te	Nkop on	Ilkeri n	Ilmaral	KFNR
Source of firewood	54.7	82.1	13.2	40.0	100.0	46.7	.0	28.6	.0	74.6
Employment	10.9	.0	15.8	4.2	.0	6.7	.0	14.3	.0	28.2
Source of food	20.3	25.0	71.1	42.1	.0	20.0	66.7	42.9	.0	1.4
Source of seedlings	9.4	3.6	.0	.0	.0	.0	.0	.0	.0	4.2
Use in research activities	1.6	.0	.0	.0	.0	.0	.0	.0	.0	1.4
Educative	4.7	.0	.0	.0	.0	.0	.0	.0	.0	1.4
Herbal medicine	20.3	17.9	31.6	23.2	100.0	20.0	.0	14.3	.0	4.2
grazing	26.6	35.7	50.0	8.4	.0	6.7	33.3	14.3	.0	12.7
Source of construction materials	26.6	35.7	21.1	28.4	100.0	6.7	100.0	71.4	.0	18.3
Attract rainfall	.0	.0	.0	24.2	100.0	20.0	33.3	.0	.0	18.3

4.5.4 Household Income from Products and Services

The forest based sources of income for the households are limited to products extracted from the forest and they include: honey, herbal products, *Ocimum kilimandscharicum* Guerkeleaves, *Mondia whytei* (Hook. f.) Skeels roots, grass, seeds and butterfly pupae, with non-extractive uses like eco-tourism being undertaken in the PFM regime and just started in the community regime. Firewood sale was a common source of income in all sites. Kakamega Forest Reserve had the highest sources of income to households, with Virhembe village where PFM has been practiced longest having the highest diversity. The village had IGAs initiated through PFM like tour guiding and grazing with butterfly farming and *Ocimum* (*Ocimum kilimandscharicum*) being small-scale cottage industries serving as a source of income in the PFM regime only. Households raised seedlings in nurseries for income generation from seeds and or wildlings obtained from the forest.

In the community regime, the direct income source for the households were very diverse with grazing, herbs sale, honey and firewood being the major activities, tour guiding emerged as a new livelihood source. The mean value of the products accessed by households from the forest indicates the PFM regime offers the highest benefit with key products being firewood, food and construction material (Figure 4.21). The government regime mostly offered employment opportunities, construction materials illegally and food through fruits (especially guava fruits..

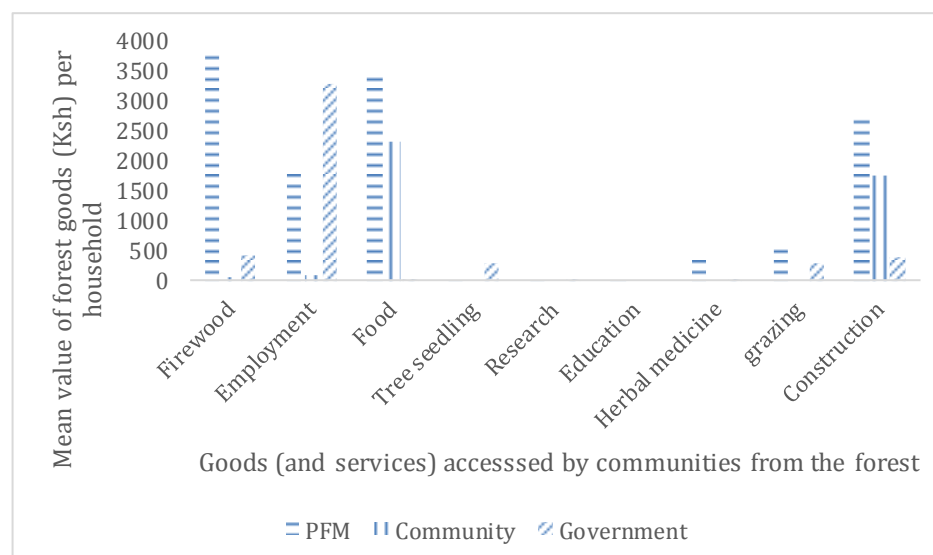


Figure 4.21: Mean value of goods per annum (Ksh.) accessed from the forest by households

The average gross household income is significant across the regimes ($F=4.953$, $p<0.05$) with a higher income for government (households were also involved in cash crop farming like sugarcane) and community regime (where households are keeping livestock, farming and selling forest products) and lowest for PFM regime (where households mainly did subsistence farming) (Table 4.19). The higher household income for government regime households was attributed to commercial growing of sugarcane.

Table 4.19: Gross income across the regimes

Regime		N	Sum	Mean
Community	Total Income	130	24742370.00	190325.9231
	Valid N (listwise)	130		
Government	Total Income	71	14941910.00	210449.4366
	Valid N (listwise)	71		
Government and community	Total Income modified	122	12284930.00	100696.1475
	Valid N (listwise)	122		

There was a significant difference for incomes from forest products ($F=4.789$, $df = 2$, $p=0.009$) across the regimes (Table 20).

Table 4.20: Average annual household income from forest products

Form of management	Income from Forest products
PFM	19860.53
Government	18558.79
Community	55246.72

Forest based incomes of households participating in PFM and Non-PFM Households are significantly different ($P=0.047$) at 95% (Table 4.18). This further confirms research hypothesis 3 as it shows that PFM provides households with a higher income. Part of the income for households not participating in government regime may be attributed to leakage from PFM activities through training and social networks.

Looking at overall household income, this was higher in the government regime, mainly from cash crop farming. The forest related incomes were higher in the community regime and least in the government regime. The households in the PFM regime had the highest (seven) diversity income sources compared to two for government regime households which included seedlings and tour guiding. Subsequently, households participating in PFM in the PFM regime were having higher income than non PFM households. This study found that communities were accessing monetary benefits from investments and sale of forest products, further affirming findings by Schreckenber and Luttrell (2009) that there was income accruing to households implementing PFM in Kenya. The high income in the PFM regime would be attributed to income sources from IGAs initiated by PFM. These findings contrast Phiri, Chirwa, Watts and Syanpungani (2016), who indicated that

there was no monetary benefit accruing to the community in Kenya under PFM. Households in the PFM regime had different incomes with an annual income of Ksh. 61,657 for households participating in PFM against Ksh. 11,660 for those households not participating in PFM.

The survey confirmed the findings of Katila (2008) that forest based-income in the PFM site, for those households who were participating in PFM was significantly different ($P=0.047$) than for the non-PFM households. However, the proportion of forest-based income is only a little higher for the PFM-participating households, suggesting that this is not the cause of their higher income. It may instead be that participating households are already better off before they start participating in PFM (Schreckenber& Luttrell, 2009; Vyamana, 2009; Chomba et al., 2015).

4.5.5 Forest Management Costs Incurred by Households

The cost incurred by households from three forest management activities were: meetings, patrolling and community committee officials' engagement, and it was clear that there was a very high level of non-participation in all governance regimes. The cost (time spent on forest activities instead of other productive activities) was increasing (Figure 4.22) more in the PFM regime, with the community regime witnessing an increase only for CFA officials. The households indicated the cost of meetings and CFA official engagement on forest matters to be increasing since 2000 across all the sites but least in the community regime. The cost of patrolling was increasing in the PFM and the government regime but was absent in the community regime. This is an indication that community assists in patrolling in government regime. Though forest management costs were increasing across the Forest FAC, a large number of households were not affected as PFM is a membership activity and costs like patrolling impacted only on PFM members and not the whole community.

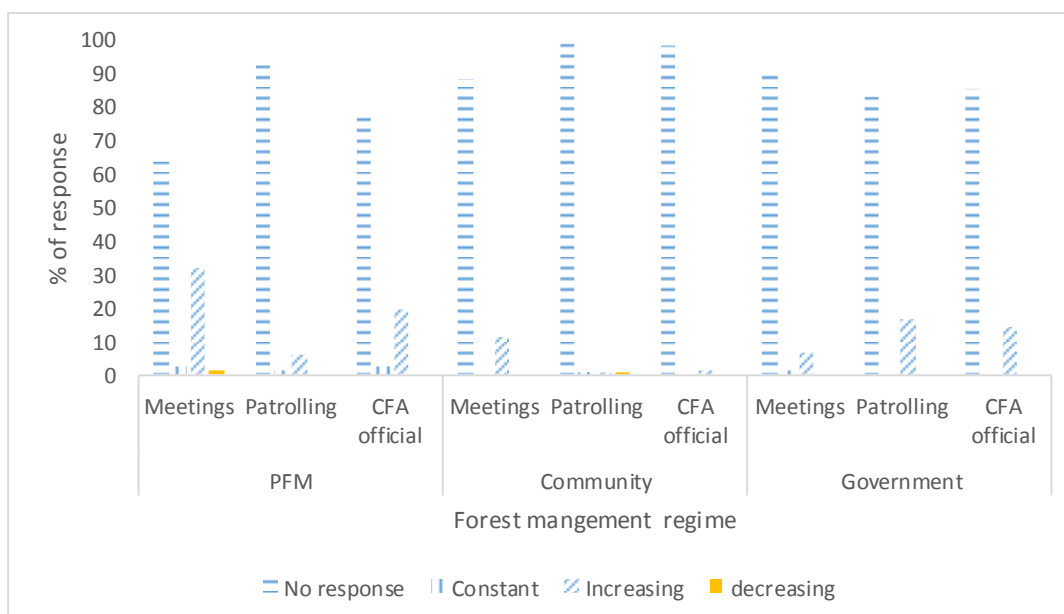


Figure 4.22: Perceived change in the forest management costs incurred by households

Attending meetings by household was a major cost that was increasing across the sites but was higher in the community and the PFM regimes than in the government regime. In the community regime, the meetings are due to increased forest use which demands more community meetings to plan. This was high for daily and monthly meetings. The highest non-participation was in the government regime (67.6%) followed by the PFM regime (36.1%) (Table 4.21). The community regime had the highest percentage of participation in meetings as the community were trying to form committees as a means to enhance forest management.

During FGD the households in the government regime, indicated that though they did not have formal mechanisms to engage with KWS, as was the case in the PFM regime, there were nevertheless community groups like community tour guides and KEEP. The community were having frequent meetings so as to establish partnerships with KWS. Being a community committee official, engagement (in CFA activities)

was a cost incurred in all sites with least costs in the PFM regime and high costs in the community and the government regimes where CFAs were forming and the community was struggling to find a mode of engaging respectively.

Table 4.21: Frequency (%) of household attendance at Management Meetings across the three Regimes (community, government and PFM)

Regime	No participation (%)	Frequency of attending management meetings					Total	
		Daily	Weekly	Bi-weekly	Monthly	Bi annually		
Community	17.7	31.5	18.5	1.5	29.3	1.5	100%	
Government	67.6	2.8	7.1	2.8	19.7	0.0	100%	
PFM	36.1	0.8	40.2	0.0	20.5	2.4	100%	

4.5.6 Improving Household Forest Based Livelihoods

In order to improve livelihoods under their respective governance system households outlined activities that need to be implemented (Table 4.22).

Table 4.22: Activities to improve forest contribution to household livelihoods (n = 323)

Activities to improve forest contribution to household livelihoods	Response (%)
Allow for active community participation in forest management	46
Capacity building and creation of awareness	11
Initiate and fund additional non-forestry nature-based enterprises and IGAs	11
Development and operationalization of management plans and agreement	8
Diversify forest based enterprises and provide affordable credit facility and better markets	7
Empower communities to implement the law	7
Enact subsidiary legislation especially on benefit sharing	5
Track benefit sharing through approved community forest management agreements	5

The respondents' perceived that decentralization may not lead to improved livelihoods. This concurred with studies done in Nepal, Kenya, Uganda and Tanzania (Katila, 2008; Schreckenbergr & Luttrell, 2009; Gurung, et al., 2011), who showed that community forestry has not always led to equitable distribution of forest products or improved the poorest community members' access to forest products. This differs with Bulut and Abdow (2018) who noted that decentralization has the potential redistribute wealth. Further, the reasons for inequitable livelihood outcomes relate to distribution of power among local actors, inequitable participation, inequitable skills and capacities to benefit from common resources. This scenario was noted by Franks (2004) that decentralization was neither good nor bad; but if designed well it can move decision-making closer to the people and improve governance including the efficiency of service delivery. These scenarios were common in the study sites.

4.6 Institutional Factors that Support or Constrain Decentralization of Forest Governance in Kenya

This section focuses on institutional factors affecting forest governance. Three types of institutions are considered: policy factors are analysed in sub-section 4.6.1, legislative in sub-section 4.6.2 and organisational factors are discussed in sub-section 4.6.3.

4.6.1 Policy Factors

The policy factors that influenced decentralization were mainly involvement in forest policy formulation at both national and county level including the extent to which the policies support decentralization of forestry governance.

4.6.1.1 Involvement in the Formulation of Forestry Policy

The policy-makers indicated that the Ministry headquarters deal mainly with policy and legislation formulation (69.4%) while 22.2% indicated Ministry headquarters was involved in policy-making and budgeting. The Ministry involvement in several forest management aspects with perceived involvement in: policy guidance and review (33.3%) in collation of public desires and aspirations to inform future policy development; implementation of policy and legislation on forest management (30.6%); supervision, monitoring and evaluation (19.4%); coordination of the implementation (8.3%); formation of FCC (5.6%) and collation of public desires and aspirations (2.8%) as indicated by policy-makers'. Policy-makers indicated that community and forest station-level actors primarily took part in consultation, whereas conservancy and particularly national-level government actors were more involved in taking decisions about policy (Table 4.23). Consultation in policy-making facilitates needs broad and representative participation that ensure effective decentralisation.

Table 4.23: Proportion (%) of policy-makers who perceived the policy formulation role of actors at different levels to be high or low (n=36)

Level (and Rating) /Action	National		Conservancy		Station		Community	
	High	Low	High	Low	High	Low	High	Low
Decision-making	73	27	63	37	33	67	39	61
Consultation and decision-making	60	40	65	35	54	46	43	57
Consultation only	46	54	50	50	59	41	67	33

The national government was involved more highly in policy-making than the other levels of government but was perceived to have low involvement in consultations. The non-inclusive and less participatory decision-making process in decentralization which relegates the communities to mere recipients and implementers of policies was

likely to negatively affect decentralization calling for communities to secure decision-making power over the decentralization process (Hajjar, Kozak & Innes, 2012). The need for community participation in decision-making was premised on the normative principle that those closest to the resource must effectively participate in its management for it to be managed responsibly (Ribot, 2002). The failure to consult could be a pointer to deconcentration and delegation as indicated earlier. The communities were perceived to have more involvement in consultation than in decision-making, leading to less influence on the level and type of decentralization.

4.6.1.2 Political Will

The policy-makers indicated that decentralization (69%), had improved revenue collection for the State. This was supported by revenue trend analysis of Isecheno forest station in the PFM Regime (Figure 4.23). This is likely to influence the government positively towards decentralization

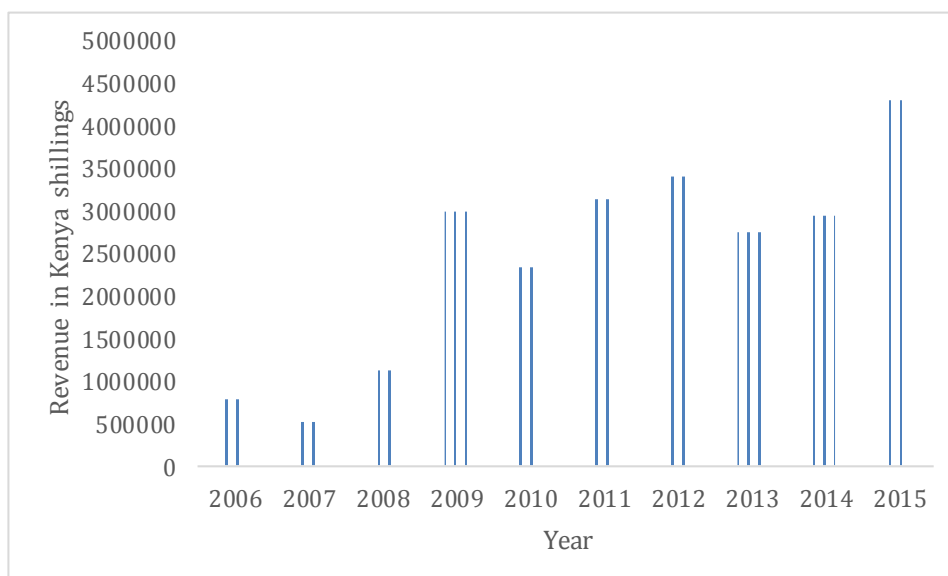


Figure 4.23: Trend of revenue in PFM regime (Isecheno forest station)

Further, The Forest Conservation and Management Act, 2016; the Constitution of Kenya, (2010) Draft National Forest Bill, 2015 (GoK, 2015) and National Forest

Programme (GoK, 2016b) all support decentralization. This was in line with Katila (2008), that one of the most important issues in devolving rights to the local level was the governments' long term commitment to support devolution policies and the development of democratic governance of forests at local, regional and national level. The government has facilitated key field units responsible for decentralization including FCCs and CFAs. In Kenya, decentralization has been initiated through external and State support unlike Cameroon where it was a State initiative with massive external aid (Oyono, 2004). The legislative process though has given the State more power than other stakeholders to determine the potential roles of other actors who are subject to the decentralization reforms made by the State and then decide whether to adopt or reject them (GoK, 2016c).

The policy-makers perceived that decentralization of forestry management being implemented are not optimally contributing to better forest management when compared to the government regime where there is no decentralization. This regime though faces a challenge of not contributing to livelihoods improvement. The PFM regime provides a win-win situation for better forest management and improved community livelihoods. The community regime was facilitating adequate access to benefits further contributing to resource degradation

4.6.1.3 Resource Sharing and Gender Equity

Decentralisation was perceived by policy-makers to have insufficiently considered differences between regions (42%), conservancies (47%), forest types (50%) and community livelihoods (64%). This is likely to affect resource allocation to areas that require affirmative action and fail in supporting pro-poor approach as noted by Holey (2007). Failure to enhance gender equity in decentralization was likely to form "forestry elite" which does not respect traditional socio-political and legal norms

as Oyono (2005), states that in Cameroon, it allowed young people to enter the scene of forestry management. In Kenya, youth and women participation is not provided for at the Board level as The Forest Conservation and Management Act, 2016 part II section 9, 1 (g) i-iv has a clear provisions for who can be appointed. The section does not mention the inclusion of youth and women as members of the forest conservation committee (GoK, 2016a).

The challenge mentioned by policy-makers is facilitation of the members to get views from the constituents they represent. In Nepal's Community Forest User Groups (CFUGs), both men and women have an equal right to membership, and each CFUG's executive committee is required to have at least 33% women (Chapagain & Sanio, 2012). Although The Forests Act 2005 (GoK, 2005a) had this provision, it is no longer in the 2016 revision. In Kenya, each forest adjacent individual has a right to be a member but it has been impacted negatively by the CFA requirement of pre-payment of a fee for membership and annual subscription fee (Schreckenber & Luttrell, 2009; Mbuvi et al., 2015).

4.6.1.4 The Effect of Decentralizations on Forest Governance

The main reasons given by policy-makers for better forest management were: improved community livelihoods through sustainable utilization of forest resources (37%); community involvement in decision-making to the board level (33%); devolution of power to lower levels like FCC (11%) and other stakeholder inclusion (11%). Policy-makers indicated that forestry decentralization has provided opportunity for improved forest governance through enhanced community access to resources (75%), stakeholder participation in legislation making (64%), broadening participation in management decisions (61%) and increased stakeholder access to information (64%) (Figure 4.24).

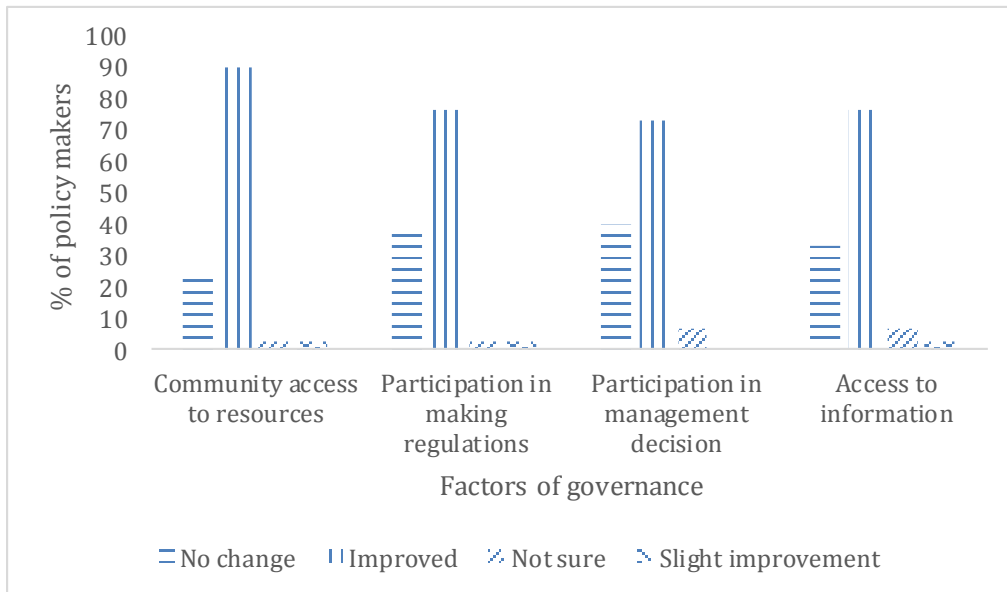


Figure 4.24: The effects of decentralization on aspects of forest governance as perceived by policy-makers (N=36)

4.6.2 Legislative Factors Influencing Decentralization

This study highlighted several legislative factors that affect the decentralisation process: The Forest Conservation and Management Act, 2016, The Wildlife Conservation and Management Act, 2013 and several regulations and guidelines like the PFM and PFMP (KFS, 2015a; KFS, 2015b) that had clear provisions to support decentralization and guide community participation in forest management. The legislation created new management levels at KFS headquarters and in the field. In the field, they are supposed to be committees at multiple levels: FCC, County forest committee and forest station committee. All of these committees are expected to be very inclusive, with a membership that ensures community participation in all levels of forest management.

The legislative process was constrained by the household less involvement in key activities like protection, conservation and formation of CFAs. Additionally, the low involvement of community in CFA formation was an indication that the organisations

are being formed by other stakeholders (KFS and NGOs). This was likely to lead to them addressing needs of other stakeholders and not the communities leading to negative impacts on decentralization.

The process has been beset by negligible transfer of power to lower levels and failure to recognise the need to shift extensive significant discretionary powers to popularly elected community representatives and downwardly accountable local institutions (Agrawal & Ribot, 1999; Muhereza, 2003). Those who have received powers in Kenya to manage the forest resources are State organs similar to Nepal according to Agrawal and Ribot (1999). The CFAs have been assigned responsibilities not power to make decisions (Chomba et al., 2015). The powers have been transferred to lower level actors who are accountable to their seniors along the hierarchy. The CFAs officials though elected, they are more accountable to the government and NGOs and not to the local communities. The KFS has been transferring only those powers which increase their revenue and reduce costs. The executive still holds almost all the powers and very little has been transferred to FCCs and CFAs (Chomba et al., 2015). The lack of downward accountability negates the spirit of good governance under devolved system.

4.6.2.1 Facilitating Decentralization Implementation

Proper implementation of decentralization is important and requires adequate facilitation. The policy-makers perceived that resources (financial and human) allocated to the entities at the intermediate level (Forest station, zonal, station and conservancy) are insufficient to effectively undertake decentralization (Figure 4.25).

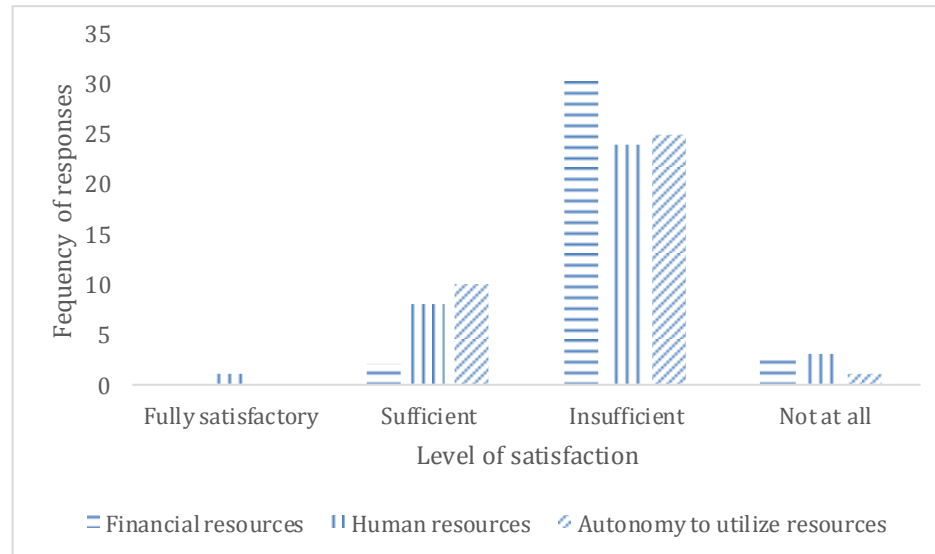


Figure 4.25: Resources allocation trend for effective decentralization implementation

Policy-makers indicated that autonomy in resource utilization was inadequate though it was improving. Improvement on of human resource capacity was perceived to be the start of human resources building; a foundation necessary for decentralization implementation and institutionalization. There was marked dissatisfaction with financial resource allocation whose consequences may be inadequate implementation of decentralization as it would affect capacity building of officers, stakeholders and community users as noted by Monditoka (2011).

There was a high likelihood of differential implementation of decentralization as the policy-makers strongly indicated that forest legislation did not sufficiently take into consideration the varying socio-economic and biophysical context of the forest. 64% of the Policy-makers indicated that legislation did not consider conservation status (the needs and priorities of different forest types) of the forests in different parts of the country. The type of the forest was not considered by forest legislation as indicated by 47% of the policy respondents. For example, interviewees explained that the Forest conservation and management Act, 2016 provide for similar management

requirements for all forests in the country even though they face different socio-economic pressures. The community in KFNR and KFR are by law not allowed to access timber from indigenous trees from the forest despite their needs. Farming is also not allowed in the National forest reserves even if it may not negatively affect biodiversity.

Though legislation offers opportunities for decentralization, it was indicated that they do not take into account the differences in forest types and poverty levels as this may lead to further marginalization of the poor. Then the question was should we have special rules for specific forests that took care of special needs of the local community as we used to have with Chapter 385 of the laws of Kenya that dealt with forest before The Forest Act, 2005 and The Constitution of Kenya 2010. It was important to recognize the poor require special legislation to support their participation. This would include deliberate actions to provide support, access forest products as stated by Hobley (2007), that having pro-poor policies are meant to improve the assets and capabilities of the poor.

There was danger of the community and government implementing decentralization differently. The State in Kenya enjoys almost exclusive rights in defining and controlling the process just as it was in Cameroon (Oyono, 2005). This may be so considering that 47% of the policy-makers indicated that information on decentralization is insufficiently disseminated to lower levels.

There was incomplete decentralization to lower levels as it was noted by Key informant discussion that in Kenya, the responsibilities are being transferred to CFA who are elected by PFM members and they have strong voice to engage the Forest managers but do not have discretionary powers. This scenario was common in several African countries: in Senegal, responsibilities in forest management were devolved to

local elected councils without devolving access to the related commercial profits; in Burkina Faso, powers to cut, sell and manage forests have been devolved to private project based committees, rather than to representative bodies (Ribot, 2010) and in Zimbabwe, CAMPFIRE programme, powers were transferred to District Development Committees who were largely under the control of central government (Agrawal & Ribot, 2000).

This is being exacerbated by the forest legislation, which was still operationally centralized despite The Forest Conservation and Management Act, 2016 providing for decentralization, KFS was still retaining the rights through legislative requirements like plans and several stages of authorization before access to commercial products and un-explicit provision for benefit sharing in the Act. This was unlike in Mali where, according to Agrawal and Ribot (2000), the devolved powers included: the ability to reserve part or all of any forest in their domain for any purposes they see fit; the right to develop or to reject forest management plans presented by the forest service; the right to a portion of the forest tax (this portion is to be determined by ministerial decree). Under same law, the Forest Service has reserved for itself; some control over the elaboration of commercial forest management plans; the right to adjudicate disputes over the quantities allowed for commercial exploitation and the role of collecting forestry taxes and delivering permits. Further, in the Kenyan context where the government is the main player in management of public forests, the community stands no big chance of exclusively managing the forests on their own despite the introduction of PFM (Kariuki, 2008).

4.6.2.2 Decision-Making Authority within Decentralized Governance

The policy-makers (39%) indicated that the community should legally be the authority responsible for decision-making over forest management (Figure 4.26). This

perception differed with the Forest Act which gives which KFS more power than the community who can only report illegal access to KFS.

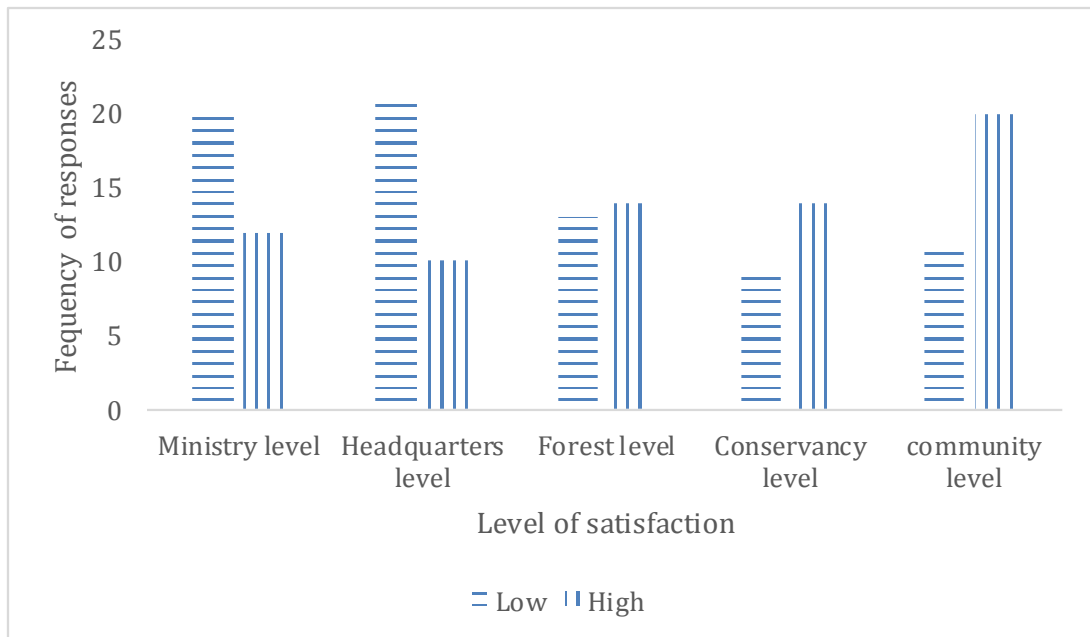


Figure 4.26: Management level perceived by policy-makers to be responsible for making-decisions over forest management

The KFS headquarters has failed to adhere to the principle of subsidiarity by instituting bureaucratic and expensive means of power transfer and ensuring that they are still in control of most forestry functions. This was similar to the perception by policy-makers and civil society that the government was still controlling the process in Kenya. The policy-makers' evidently showed that major decisions relating to forestry management such as financing of forest management and employment and deployment decisions are made at the headquarters and least at the local level (Table 4.24).

Table 4.24: Decision-making levels concerning forest management support services along the decentralized governance chain as per the Policy-makers perceptions (no of responses)

Activity/Decision-making level/	Financing of forest management	Follow-up and evaluation	Employment decisions	Deployment decisions
National level	33	12	33	19
Conservancy level	1	8	1	5
Local level	1	6	1	5
All levels	0	3	0	1
National and Conservancy levels	0	6	0	5

This study showed that among the households who indicated that decentralization had moderately contributed to forest conservation, 50% of the households attributed this to lower management structures such as FCC having limited power in decision-making on forest management activities like licensing. The reasons were poor national coordination of the decentralization process (25%) and no benefits gained from decentralization (25%).

The national government was indicated by policy-makers as having overall authority on decision-making in all aspects of forestry services (Figure 4.27) with authority for policy formulation being its preserve. Policy formulation authority was perceived by the policy-makers to be very low at the community who were contributing very high at service provision activities like benefits and inputs.

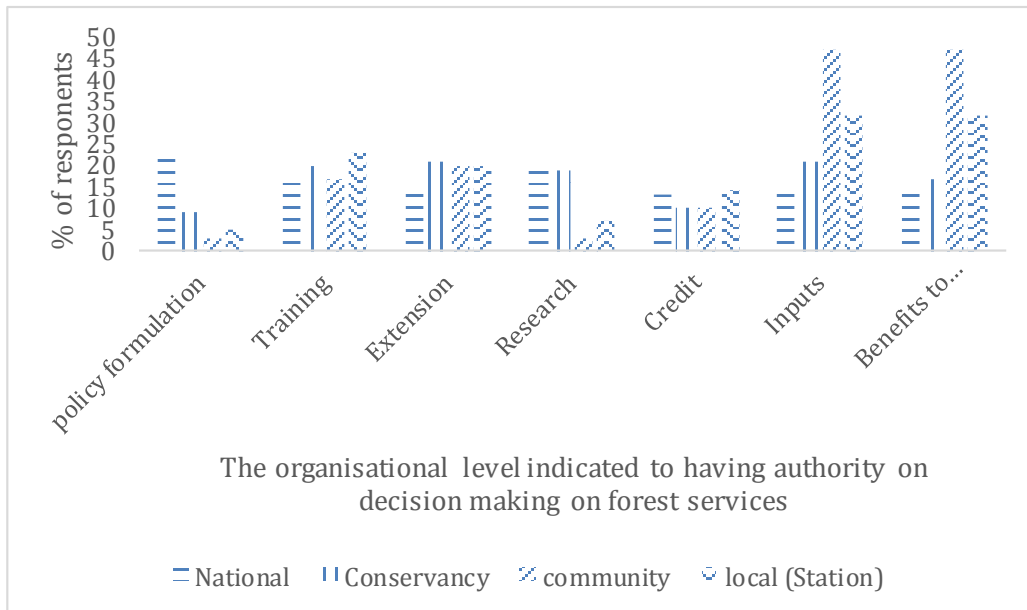


Figure 4.27: Forest management organisational level indicated by policy-makers to be having overall authority on decision-making on forestry services

According to the policy-makers', it was anticipated that the authority responsible for decision-making over forest management should be at the community level. They indicated the Ministry and KFS headquarters level (42% and 39% respectively) should have the least authority (Figure 4.28). Within government, the forest station management level was taken to be the level with the highest authority to make decision followed by the conservancy level. If the station is to adequately execute this responsibility, it will require well trained and skilled manpower supported with adequate resources.

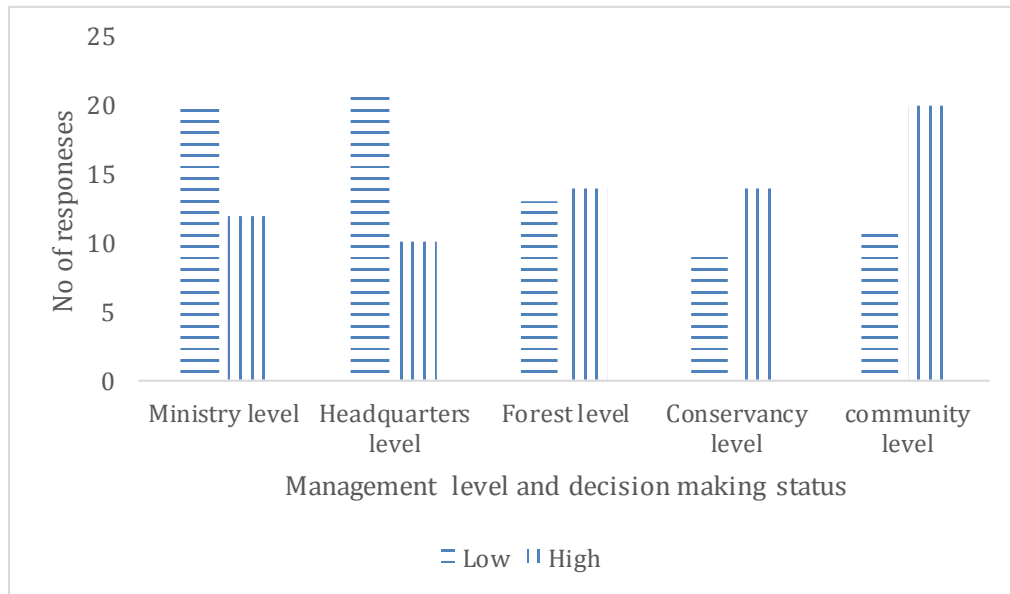


Figure 4.28: Management level expected by policy-makers to have authority to make decision on forest management

The households' and policy-makers perception reflects the practice where the government and the senior officers are in charge but fails to appreciate the expected paradigm shift where communities are expected to be involved at all stages with the Ministry roles being more regulatory and advisory. A mechanism needs to be put in place to facilitate the change that would ensure communities participate more in decision-making and consultation in order for them to have more influence on the whole process to avoid a trend where the government retains significant control over the process through legislation (Hajjar et al., 2012).

4.6.2.3 Supervision of Decentralization

An important legislative factor is who has the legal authority to supervise decentralisation. Policy-makers' views on this differed for actors at different levels of forest management from the Ministry to the station level. The policy-makers' viewed the Principal Secretary (PS) (46%) and the Cabinet Secretary (36%) as the primary

supervisors of decentralization, with a few respondents also mentioning the Director KWS (7%), Director KFS (5%), HoC (2%), Prime Minister (2%) and Steering Committee (2%). The Forest Management and Conservation Act, 2016 assigns this role to the Cabinet Secretary. The steering committee should have a higher role as they are in most cases multi-agency. At the KFS headquarters, 59% of the policy-makers' indicated that the Director KFS was the supervisor of decentralization and the Board of Management was also viewed to have a moderating role (24%) with the PS having the least role (5%). The others were partnerships departments (3%), HoC (3%), KWS (3%) and NMK (3%).

The CFA was perceived (70%) to be the supervisor of decentralization at the community level by the policy-makers'. The others were EC (9%), no supervisor (9%), forester (6%), user associations (3%) and KWS warden (3%). The perceived role of CFA was so high that the other actors' roles are very minimal and creating a possibility of the CFA implementing without any checks from the other actors.

Key informant interviews at policy level opined that there was need to activate the requisite committees at various levels like FCC, forest station committee, County forest forums, management teams and push for legislation to be enacted and formalize the partnerships through signing of FMAs and MoUs. This would ensure that they play the much needed oversight and advisory role while ensuring that the process was more inclusive than when the KFS was managing alone.

Decentralization implementation at each management level may face challenges as the person in-charge at each level was the one being perceived to be their own supervisor. Decentralizing supervision requires re-organisation as it was shown that the CFA have decentralization role at the community and station level. Unfortunately at community level, there was a feeling that there was no one supervising

decentralization creating a possibility of the weak being negatively impacted. Since the State has retained the legislative role in PFM it may be implied that it supervises the CFA whose role is implementation (Chomba et al., 2015). The PS has a supervisory role at the Ministry level and KFS headquarters. The KFS board was perceived to have supervisory role over KFS Director but very low. The Head of conservancy was perceived to have supervisory role across all the levels with the forester having a similar link except with the KFS headquarters. This perceived missing link needs to be addressed as this was the field decentralization implementation point (fulcrum) in the forestry sector.

The Forest Manager was indicated (48%) by the policy-makers' to be taking the lead role in decentralization at the forest station. They did not mention committees which are being formed at stations where PFM has been initiated. The Ecosystem Conservator roles were perceived to be very low (23%) by the policy-makers. The others were FCC (9%), CFA chairperson (7%), HoC (7%), KWS warden (4%) and KFS Director (2%). At the conservancy level The HoC was indicated by policy-makers (52%) to be supervising decentralization. Supervision by the FCC was indicated at (14%) and the EC at (23%). The others were: forester (9%) and national government (2%). The overwhelmingly perceived higher role assigned to the HoC would negatively impact on decentralization implementation. It reduces the supervisory role of the FCC at conservancy level requiring for an enhanced role.

This scenario needs to be changed and put in place a multi-stakeholders committee assigned roles that are supported by well-defined responsibilities. This is necessary realizing the multiple uses of forests require maximizing and in order to satisfy the multi-stakeholders calls for committees and supervision that are multi-organisational.

This should be mitigated by establishing a supervisory unit domiciled at the Ministry headquarters.

The policy-makers indicated that the Ministry headquarters should have a higher authority over decentralisation than KFS headquarters. This would enable the Ministry headquarters to exercise its oversight authority over KFS. They also felt that the forest station level, as the unit in charge of forest management, should be assigned higher forest management authority than the conservancy. The conservancy role should be coordination and giving policy direction and particularly acting as the link between the field and the headquarters. This differs from the reality where the station has least authority and was lowly resourced.

The policy-makers acknowledged the role of all the parties and the broad inclusiveness required for decentralization to succeed by indicating that KWS, KFS Board of Management and the PS all have a role. The Board and the CS are expected to exercise oversight as the Director decentralizes to the lower units. The Board having a big supervisory role would lead to a conflict of interest between the Board and the Director. No role for the Board would also be problematic as it would be a challenge for the Director to decentralize and supervise himself or herself.

4.6.2.4 High Costs and Low Benefits from Decentralization

Decentralization process involves high costs due to time spent in decision-making through involvement of many stakeholders and associated conflicts. Decentralisation was felt (42%) to be an expensive process by households in terms of the time required to bring together multiple stakeholders at different levels of management. High decentralization costs and low benefits to the implementers was major constraint

though decentralization was found to contribute to forest conservation and improve livelihoods.

Decentralization cannot resolve all forest management problems and improve community livelihoods. The study findings showed that decentralization may not yield the anticipated results as substantial decision-making power, resources and benefits sharing from forests are still centralized and those receiving new authority are often neither representative nor accountable, as also noted by Gregersen, Contreras-Hermosilla, White and Phillips (2004). This was similar to observations by Banana et al. (2007) that placing authority of forest governance at one specific level of government (local, central, or multi) may not succeed at maintaining the flow of forest goods and services, through time, to all stakeholders. Nevertheless, the reforms in the forest sector facilitated by The Forests Act, 2005 and taken forward by The Forest Conservation and Management Act, 2016 and The Constitution of Kenya, 2010 have started to reverse the centralized non-participatory governance paradigm by institutionalizing and embracing governance and leadership system based on integrity (GoK, 2010a).

4.6.2.5 Limited Option for Local Level Units to Legislate

In Kenya, the legal documents do not seem to confer any direct access to commercial user rights to communities. The forest management plans are not legally binding. Besides, the FMA requires an operational plan to enable the communities to exploit the resource (KFS, 2009; GoK, 2016a). In some cases, additional requirements are a pre-requisite. The CFAs are required to register a company if they are to exploit commercial products or engage in eco-tourism. This process involves the CFA going through the government procurement process (KFS, 2009). This was also not clear as

no community has utilized forests outside what was initially being accessed before decentralization.

Kenya could adapt the legislative system in Tanzania where the village government has clear provisions on what can be done with plans and how they can have legally binding plans. In Tanzania the village government make legally binding by-laws which define who is entitled to the access and use of the village forest reserves. The by-laws define how or under what conditions this can be done. They set the rules for forest management, protection and use, as well as the penalties for breaking the rules and procedures for handling offences (Katila, 2008). In Kenya this could start by having the CFA PFM operational rules gazetted by the Cabinet Secretary so that they become by-laws and thus becoming legally binding.

The situation in Kenya, as observed by Agrawal and Ribot (1999), that local governments (County government) should have power to make and enforce decisions and rules and locally empower actors who would be downwardly accountable to their constituents for decentralization to be effective. Further, in Kenya, the decentralized process was further weakened by the absence of a unit dealing with decentralization. In Mali, there is the Mission of Decentralization (in the Prime Minister's office) which determines the territorial extend of the forested domain of the local governments (Agrawal & Ribot, 1999). Effective decentralized management generally involves devolution of not only management functions, but also some authority or rights, including the authority to raise revenue dedicated to forest management and conservation functions. In Kenya, the CFAs charge additional fees to the government legislated fees in order to raise funds which makes decentralization a burden to the communities.

Given that decentralization involves a significant shift in responsibilities to the local level, it is perhaps surprising that 50% or less of policy-makers felt that the station and community level actors had a high role in the consultation process and indication that the communities were not sufficiently consulted. Further, the communities indicated that they were less involved in decision-making during the process of policy formulation as was also noted by Chomba et al. (2015). This was an indication that the community representatives did not give feedback as expected. This was also noted in the study where the respondents pointed to a situation where the CFA leaders were accountable to KFS and other facilitating actors.

Transfer of powers under decentralization to the local level might contribute to enhanced equitable distribution of benefits from forest resources and regulating forest utilization effectively as the institutions are in close contact with the users. From the study though, there was need to improve community participation in formulating regulations and taking management decisions. These are basic tenets necessary for successful implementation of decentralization that have to be institutionalized at these early stages of the process (Bulut & Abdow, 2018)

Similar observations were made by Persha et al. (2011) and Chinangwa, Sinclair, Pullin and Hockley (2016) that when local people participate in rulemaking they are likely to make rules that are more suited to local conditions. Further, Persha et al. (2011) indicated that participatory rule making may also help shift incentive structures for forest users to undertake decisions aimed at a more balanced prioritization between activities that maintain good forest condition and benefit flow over longer time horizons (hence biodiversity conservation).

Systems are required to mitigate against the low involvement of the lower management units in decision-making as this negates the spirit of decentralization

(subsidiarity) as the lower levels did not seem to have delegated roles within a decentralizing system yet there was need to have the lower levels taking up more active participation in major decision-making. They have retained the roles of follow up and deployment decisions but still the headquarters had more deciding powers. Follow up and evaluation was perceived to be done at all levels.

4.6.2.6 Forestry Management Planning, Monitoring and Evaluation

The policy-makers at the local forest station level indicated (44.4%) that the Ministry was involved with implementation, monitoring and evaluation of policy and legislation on forest management, policy guidance 19.4%. The ministry was indicated to be involved in protection and conservation, and preparation of PFMPs at 11% each. The others functions were supervision, planning and activity prioritization. This high level of involvement of the Ministry at this level provides an opportunity for learning and influencing policy direction by the implementer actors. The policy-makers' perceived that there was involvement of communities in sensitization, training management and planning (22.2%) and implementation of activities (19.4%) but there were no means to have community interact with policy-makers.

Forest management plans are a key legal document in the decentralisation process. In Kenya they are approved by the Director (Re-designated to Chief Conservator of Forests -CCF) of KFS while in Nepal, a country with a much longer experience of decentralisation, it is the District Forest Officer (approximately equivalent to a Kenyan EC) who approves the plans (Ministry of Forests and Soil Conservation - Nepal, 1993; Katila, 2008; GoK, 2015; KFS, 2015b). The EC could also approve management plans in Kenya as a means to decentralize and empower the lower levels of management. These plans are developed as per nationally set guidelines (KFS, 2015b) and provide the stakeholders with an opportunity to participate in forest

management and use while enabling management to be adapted to local needs, knowledge and traditional resource management practices and natural conditions.

4.6.3 Organisational Factors

These are factors related to organisation architecture and the systems that support like finances and personnel.

4.6.3.1 Decentralization Organisational Structures

Policy-makers' opined that organisational decentralization facilitated Ministry restructuring of key decentralization factors. 58% perceived that decentralization facilitated reorganisation of services, 50% perceived that it led to budget realignment and 55% felt that personnel were reorganized. The Forest Conservation and Management Act, 2016 just like in Senegal (Agrawal & Ribot, 2000) has ensured that the Forest Service has retained powers over commercial forestry decisions. Besides, in Kenya, the FCC was an agent of the service under the principle "he who pays the piper calls the tune". Appointment and payment of FCC chair was likely to constrain the chairs' impartiality. The FCCs are under the strict supervision of the central authorities (KFS headquarters) and are primarily upwardly accountable. The forest service in Kenya continues to control management decisions and incorporate local populations through a circumscribed set of roles and relations with the forest with little room for autonomy as noted by Larson and Soto (2008). Kenya Forest Service unwillingness to fully appreciate the CFAs with the elected CFA officials exercising few powers worth the name and being more accountable to KFS than to the communities.

Kenya Forest Service has been re-structured to support decentralization in that it is represented down to the county level and in each forest station there is a forest manager and forest rangers at outposts (GoK, 2016a). Forestry extensions services

have been devolved to the county governments (KFS, 2015c). The Forest Conservation and Management Act, 2016 created organisational committees at all levels of management that allowed decentralization, the FCC operates at the HoC level with the County and Station level committees being provided for. The requirement by law that the KFS board should have at least three members who are not public servants has made it inclusive (GoK, 2016a).

The community organisational architecture through CFA is well-structured starting with individual members, village committees, user groups and the CFA executive members. The CFA not only work with KFS but also other arms of the government, non-government organisation and other CBOs in the region. This provide opportunity that support decentralization. The CFAs are autonomous community organisations formed and registered under Societies Act giving them the right to sue and be sued.

The CFA have inadequate legal mechanisms to ensure they are fully functional and integrated into forestry governance and have well established links with KFS so as to undertake their duties effectively. Some of the new organisations forming like CFAs are serving as forest service agents accountable to the Director of the Forest Service who was appointed by the Minister of forests just like in Mali (Agrawal & Ribot, 1999; Chomba, et al., 2015). This was the same situation in Kenya, whose effect negates the need to decentralize. In the community regime, KI and FGD indicated a weakening Oloibon structure while in the government regime there was no community organisation. Further, Lawrence and Watkins (2012) reported that successful natural resource decentralization requires strengthening local-level natural resources institutions with increased fiscal flow, enforcement, monitoring and judicial powers. This was possible through a reliable partnership between local-level resource user and central government.

The government has facilitated key field units responsible for decentralization including FCCs and CFAs. Oyono (2005) indicated that decentralized structures everywhere were extensions of the central government into the field and were dependent on the centre for budgets, personnel and ideas. The situation in Kenya was different as the structures have more civil society background than Cameroon, are independent and keep a very strong oversight over the government. Though the CFAs and FCCs keep the production responsibilities while the government keep the provision responsibilities, in Kenya, this was changing as we are witnessing CFA engaging in fund raising and in income generating activities like; bee keeping, fish farming and butterfly farming, that generate very little income for the households as well as development of physical capital like offices and eco-tourism facilities.

The CFA organisational structure has been well elaborated in The Forest Conservation and Management Act, 2016 (GoK, 2016a). The CFA formation guidelines are provided for in the Manual on forming and registering community forest associations (KFS, 2009; KFS, 2015b) The communities have gone further to form forest ecosystem based umbrella CFA associations and a National Alliance of Community Forest Association (NACOFA). There was need for further deepening of structural reform and undertaking pragmatic legislative review in order to make KFS efficient and responsive to the community needs. Kenya Forest Service has undergone major policy and organisational transformations since 2007 in great part because of promulgation of The Forests Act, 2005 (revised in 2016 to The Forest Conservation and Management Act, 2016). This has been pushed further by the citizen democratic space created by the Constitution of Kenya, 2010 and the clamour for more access rights than before decentralization.

4.6.3.2 Administrative Support to Decentralization Process

Timely and right support is necessary to support organisations to implement decentralization. It was the opinion of the policy-makers that decentralization requires additional resources to support its implementation. The key additional resources required to implement decentralization included, capacity building (36%), allocation of more funds (32%) than at present, institutional reforms and improving infrastructure (16%). These resources would facilitate more effective organisational change.

The policy-makers at community level (Community organisation leaders) and national government officers were broadly in agreement about how they ranked the requirements for communities to implement decentralisation more effectively: capacity building was ranked first, with finance a close second; of lesser importance were institutional reform and infrastructure. Interestingly, NGO policy-makers had more requirements than government and community policy-makers and differently ranked requirements (Table 4.25), while finance was also very high on their list, capacity building was considered less of a priority.

Table 4.25: Requirements for implementation of decentralization as indicated by NGO policy-makers (N =16)

Additional resources and activities to support PFM implementation	Response (%)
Provide funds	27
Create more awareness	25
Involve stakeholders in implementation	20
Increase transparency	10
Trained man power	5
Provide incentives	3
Provide opportunities and open doors for participation	3
Clear roles to avoid duplications	3
Networking and collaboration with relevant stakeholders	2
Capacity building	2

As decentralization re-aligned autonomy on resource use and human resource it did not align budgets. The failure to realign budget was likely to negatively affect decentralization process slowing the implementation of re-assigned new roles and operationalization of new offices created to support decentralization. Further, the budgeting framework makes the officers to be accountable upwards to the line ministries further slowing down decentralization. Financial resources are not only to hire professional staff, but also to equip and train these professional to effectively carry out their activities as well as for activities in resource-user communities (Andersson, 2006).

Secure funding is necessary as was noted by Andersson (2006). Inadequacies were likely to negatively affect the implementation of decentralization process. This was noted by Capistrano (2010), that decentralization of forest management responsibilities to local government and communities typically has not been accompanied by financial and other resources required to support their expanded

roles, leading to increased reliance on revenues generated from forest resources to finance operations. The incentive of the local actors to intensify exploitation of forest resources was contrary to the expectations that decentralization will improve forest management and reduce deforestation.

4.6.3.3 Provision of Forestry Support Services

Policy-makers' felt that one of the reasons that decentralization was picking up very slowly was that the Government was both legally and in practice providing most of the forestry support services (Table 4.26). The table provides household perception which are misnomer in some instances especially where, though the private sector is not legally bound to support forestry, it has been giving more support than the government, to a point that the community feel it is the private sectors mandate.

The private sector was reported to be taking up some roles especially on credit, inputs and training. The role of NGOs was also becoming more important than the private sector and producer organizations across all the forestry management activities including training, credit and inputs' provision which are critical for building community capacity. Additionally, NGOs have been very active in research, fund raising, livelihoods improvement and building social capital.

Table 4.26: Policy-makers' perceptions on the organisations responsible for providing forestry support services in theory and in practice (N=36)

Sector	Perceived Legal provider						Perceived provider practically					
	Tr ain ing	Ex ten sion	Re sea rch	Cr edi t	In pu ts	Com munit y access to benefi ts	Tra inin g	Ex ten sion	Re sea rch	Cr edi t	In pu ts	Communi ty access to benefits
Public sector	34	30	31	13	22	27	26	28	28	10	19	22
Private sector	9	7	7	19	11	6	13	8	9	20	14	7
Producers' organisation	7	6	3	6	16	12	9	8	5	9	17	10
NGOs	16	16	12	12	14	13	20	19	8	14	17	14
Church	8	11	3	6	8	7	8	8	1	7	9	5

This study corroborates with the role of NGOs (Court, Mendizabal, Osborne & Young, 2006) in governance that include: collecting, disseminating and analysing information; providing input to agenda setting and policy development processes; performing operational functions; assessing environmental conditions and advocating for good governance and environmental justice.

The legal and practical scenario in relation to provision of forest management services was undergoing paradigm shift. Even though the Government was still the major investor in the forestry sector other actors are taking up various roles. The NGOs role was also important with the private sector role being negligible. This calls for private sector and NGO participation and investment in the forestry sector. The emerging practical scenario needs to be enhanced to further entrench the positive impact of decentralization through reducing the role of government and provide a favourable environment for other stakeholders to participate. Other stakeholders have to increase funding to avoid the government determining how decentralization would be implemented as it was the major funding agency.

The Forest Conservation and Management Act, 2016 creates a KFS board; Part II section provides for appointment of non-public servants and section V provides for community participation in forest management (GoK, 2016a). The draft Forest Bill (MEWNR, 2015) objectives state that they shall encourage public-private partnerships for commercial plantations on public land, and support forest-based industrial development; support tree and forest development by County governments and recognize and support private land owners' efforts to manage forest and tree resources. The role of government should be reducing as it decentralizes governance to provide opportunity for the other actors to get into the management of forest in the country in a process described by Lawrence (2007) as one partner is losing power another gets empowered.

To harness the synergies from the partners, the government will need to develop strategy for disengaging on non-core activities and engaging other key partners so as to facilitate decentralization in the forestry sector. The transitional implementation plans (KFS, 2015c) that are enabling KFS devolve functions to County Governments would facilitate stakeholder participation in forestry. As was noted by Banana et al. (2007) institutions that are effective in moderating deforestation are likely to be those that contain a provision for periodic updating i.e. adaptive management, negotiated by all relevant stakeholders at a given time, to reflect current social context and ecological health of the forests. This could be achieved through periodic elections and awareness creation. This would see NGOs participate in provisions of training, IGAs implementation and extension. This emerging arrangement though supporting decentralization they are neither legal nor does the law bar them but the national forest programme identifies the role of NGO as facilitation and provision of technical assistance (GoK, 2016b).

It has been indicated that limited understanding of policy process result to failure to engage in an effective manner resulting to use of evidence in an ineffective way and constraint their policy influence (Court et al., 2006). This was shown in Kenya where CSO engaged parliament with minimal impact yet the impact would have been higher if they had engaged all policy-makers as observed by Court et al. (2006).

4.6.3.4 Enhancing Capacity (Human and Financial) to Implement Decentralization

The field management units' level of understanding of decentralization will determine how the process is implemented. The majority (60%) of policy-makers' felt that the KFS field (HoC, EC and Foresters) officers did not understand the level at which they could make decisions. This directly affects implementation of decentralization in the field. The policy-makers perceived that 89% of the field officers had not taken decentralization beyond what was originally expected. The policy-makers felt that the officers are implementing decentralization as an output due to minimal community consultation and inadequate training.

The field officers' inadequate understanding of how to implement decentralization was likely to negatively affect the decentralization process as it could lead to wrong decisions being made, not consulting at the right time or the right officer, the appropriate officer not making decisions and even failure to make decisions at all. This could lead to communities not understanding the process well and wrong determination of their roles in the process. This could imply that the officers might still be implementing C&C. The officers need to view decentralization as a process, adapt the process to their unique situations but work guided by the law and by experimenting to provide solutions that guide the law formulation and or review.

The policy-makers as a result of decentralization indicated that they are differentially informed on the activities that are occurring within their own command. The majority,

50% indicating that they are more informed than in the past, 25% being less informed, 17% were not sure and only 8% had no information. This has positively impacted on most aspects of forestry management (Figure 4.29). Policy-makers' perceived marked improvement (over 60%) in all aspects of forestry management as a result of decentralization.

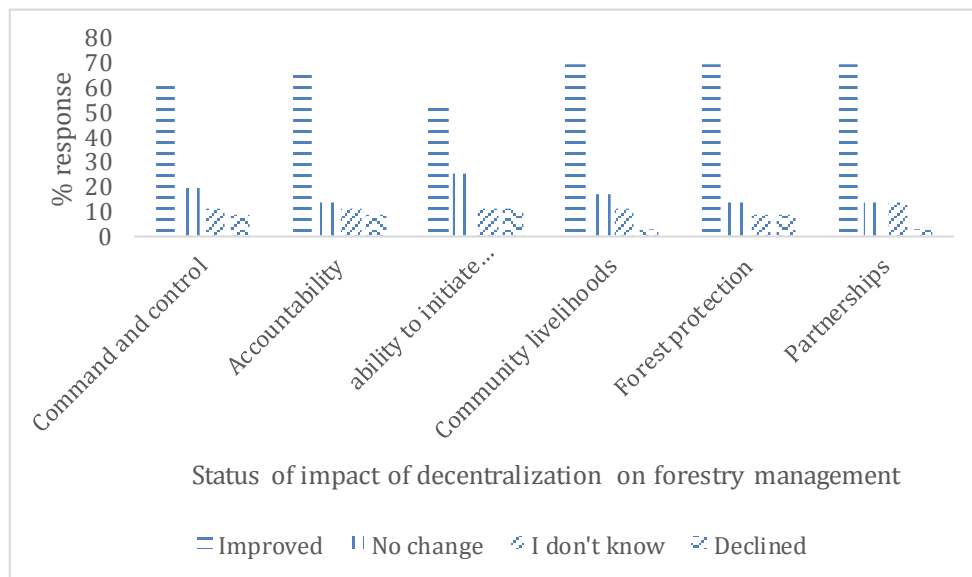


Figure 4.29: Policy-makers perceived impact of decentralization on forestry management (N=36)

Information flow was asymmetrical, with 47% of senior forestry staff (policy-makers) at the headquarters indicating that information on decentralization was insufficiently disseminated to decentralized lower levels of management. This was the same scenario with local forest administration, community representatives and NGOs (Figure 4.30). The insufficient dissemination of information on decentralization was likely to have negative impacts on the process implementation. The implementer requires information to make the correct decision when guiding local forestry administration, community representatives and NGOs who are fundamental in forestry management. The situation was more serious among officers and NGOs who also play role in guiding the process (Court et al., 2006).

Failure to undertake adequate training at the lower levels could lead to decentralization process being directed by the national government and its implementation being uncoordinated since the communities lack the requisite technical capacity and resources (Pulhin et al., 2007). This may result in implementation of deconcentration (where the central government disperses responsibilities for certain services to its regional branch offices without transfer of authority) rather than democratic decentralization. The NGOs are critical in decentralization as process facilitators through fund raising and capacity building and also playing an oversight role. They are important at the early stages of a process like decentralization where power is being decentralized from a powerful stakeholder to the community and field officers. This is likely to impede the organisation's capacity to conserve, manage, legislate and engage in livelihood activities especially the CFAs further compromising their capacity to engage and influence decisions.

It was noted that training was critical at all levels for effective implementation of decentralization through capacity building at all levels but a special focus was recommended for the headquarters and insufficiently trained lower levels to avoid negative effect on the implementation process. The stakeholders require capacity building so that they can participate effectively in the process as well as train their constituents to build their capacity to implement decentralization if the process was to take the right direction. Inadequate training was likely to lead to a situation of unclarity of roles and functions especially at the middle level. Deepening structural reforms to support decentralization in Kenya may require formation of a Unit in the Ministry which reports to the accounting officer who was the PS as was observed in other countries like Mali by a (Agrawal & Ribot, 1999).

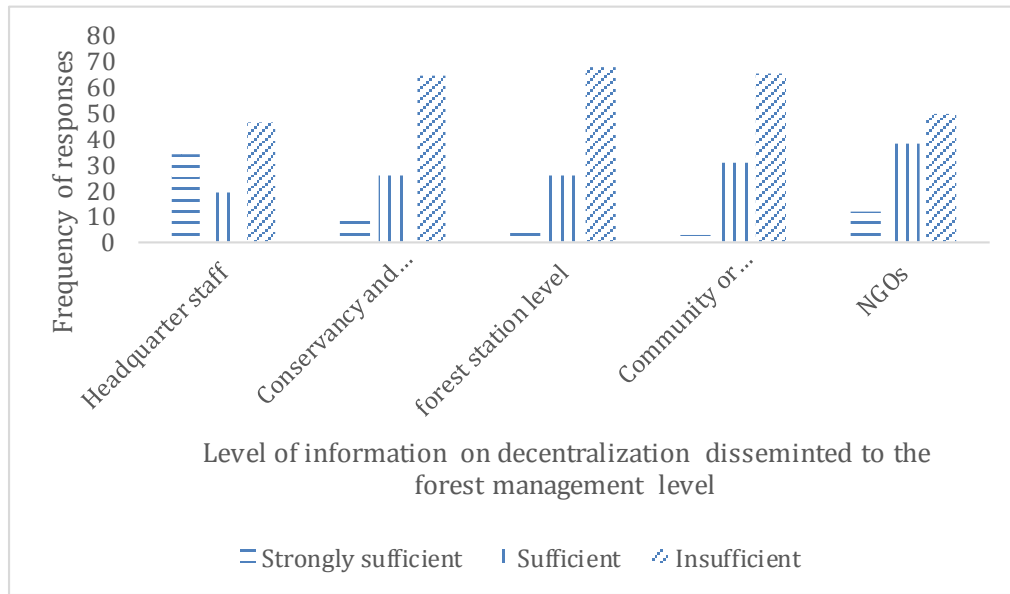


Figure 4.30: Sufficiency status of decentralization information dissemination of to various forest management levels

Capacity enhancement through training is requisite for decentralization to be implemented properly. The Policy-makers (39%) felt that decentralization was accompanied by training at national level though still a large proportion (61%) perceived the accompanying training was insufficient. It was worse with field officers and community representatives who are expected to be implementing decentralization. The policy-makers (from government at national levels, NGOs and other service providers') felt training on decentralization was insufficient (Figure 4.31) with perceived high insufficiency at the community and or representative level. The insufficiency in training for officers and local administrative units was perceived by 72% of the policy-makers.

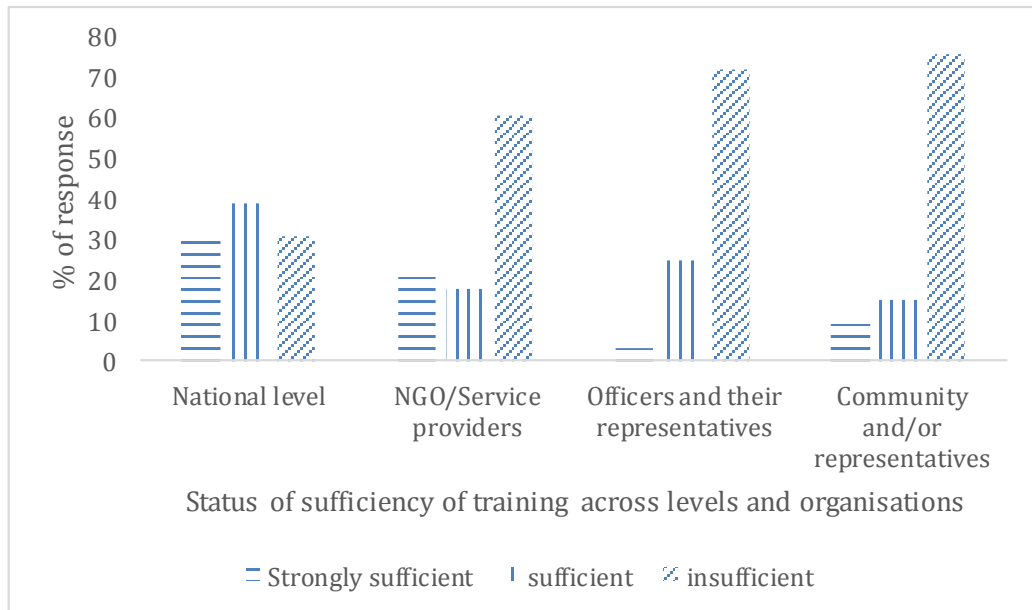


Figure 4.31: Sufficiency of training to implement new decentralization tasks in forestry as perceived by policy-makers (N=36)

The training to support implementation of new tasks that arise from decentralization has not generally been sufficient with the communities, officers and their representatives and NGOs personnel being the most insufficiently trained through participation in decentralization training. This study confirmed that decentralization requires financial investment and a wide range of technical capacities to build capacities as was confirmed by Court et al. (2006). The stakeholders require capacity building so that they can participate effectively in the policy process as well as train their constituents to build their capacity to implement decentralization if the process was to take the right direction. Decentralization in KFS was institutionally installed (laws enacted, authorities established, elected and staffed) but service delivery remains limited due to financial constraints and or the lack of congruent action by line ministries to actually devolve their functions (Ndegwa, 2002).

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMENDATIONS

5.1 Introduction

This section is divided into six sections. Section 5.1 provides the chapter outline and the summary of the findings being outlined in section 5.2. Conclusions of this study is provided in section 5.3 while section 5.4 outlines the recommendations. The need for further research is outlined in section 5.5.

5.2 Summary

Decentralization is a tool to accomplish broad objectives pertaining to sustainable management of all types of forests, as well as to achieving equitable distribution of benefits, increasing forest departments revenues, increasing control over local communities and the potential to enhance democracy and reduce poverty. The policy-makers' and communities were aware: of the forest management strategies being employed were supported by legislation; that there is decentralization in the forest sector and the communities indicated that delegation and deconcentration were the major decentralization strategies being implemented in the forest sector. Policy-makers indicated that conservation factors were more significant reason for initiating decentralization than the non-conservation factors in Kenya.

Policy-makers (84%) felt that decentralization had led to better conservation. Households in all the study sites highly valued better forest conservation with 95.8% of households in the community regime, with 93.2% of the communities in the government regime and 62.7% households in the PFM regime. The communities had a good perception of forest conservation status. They used four key indicators (open canopy, closed canopy, key tree species and cutting of trees) to determine forest

condition. A household assessment on the quality of forests indicated that in the government regime, the forest canopy was almost closed with a few community members perceiving it to be open. In the community regime, it was generally perceived that the forest canopy was closed with hardly any open canopy in the community regime. It was perceived that household involvement in forest management was the major reason contributing to better forest management.

Policy-makers (73%) perceived that decentralization had contributed to improved household livelihoods. Further, forest related income accruing to households participating in PFM was higher compared to those not participating in PFM. The PFM regime model though was indicated not to be contributing optimally to better forest management; it has more direct benefits as it was legally contributing to community livelihoods. The Policy-makers attributed improved community livelihoods to improved access to forest goods and services, enhanced income and high food production because of better conserved forest.

Decentralization has created institutions and organisational structures (laws enacted, authorities established, elected and staffed) but service delivery remained limited due to financial constraints. The State have been decentralizing power to CFA. The CFAs are members of the committees which authorize forest rights like; access, management, alienation and exclusion. This further incentivizes community participation.

The situation in the community regime where the forest was under community management may not be the best approach. Traditional authorities are notorious for entrenched gender inequalities and for favouring exclusive membership over inclusive based forms of partnership fundamental to most democratic systems. They do not enhance equity and in most cases they impoverish the rural poor communities as seen

in Loita because the communities have excluded non Loitans and elite capture is common. The government regime model was good for biodiversity conservation but did not support livelihood improvement. This would be improved if stakeholders took advantage of the legislative opportunities and the technical officers assist the community as was done by the environment officers in Taita Tavetta (Funder & Marani, 2015). The situation though has ensured better forest management but contributed negligibly to community livelihoods.

The model being practiced in the PFM regime (KFR) was being proposed to be the best (appropriate) form of decentralization. It ensures: communities, the State and other stakeholders are managing jointly; sustainable forest resources utilization; improved rural people's livelihoods and tenets of decentralization in the forestry sector of better forest management and improved community livelihoods are achieved. The PFM regime is feasible in the other two regimes. This makes it the most appropriate as it ensures that stakeholders participate in forest management, livelihood improvement advocates that there should be no calling for the transfer of all decisions over natural resources to local populations. Besides advocating for subsidiarity so that the most appropriate level for any given decision was the most local possible one, provided that making the decision at this level does not negatively impact the greater common good.

5.3 Conclusion

This thesis deviates from recommending "one-size-fits-all" as one regime would be inappropriate governance type for all forest types, may not be practical and would fail. It recommends for adaptive management of the three forest governance types. The three governance types were appropriate in their own contexts as long as they meet certain conditions. The policy-makers indicated that if well-implemented, each

governance type would ensure environmental integrity and community livelihood improvement.

Participatory Forest Management is the most widely applied management approach in Kenya. It has been taken as innovative approach towards devolution of power and responsibilities of forest management from National government and is being applied in more than 100 forests stations in the country against a total of 150 stations nationally. The appropriateness of the community regime could be enhanced through introduction of aspects of PFM that include: joint management through partnerships and development of management systems like plans and organizations. The Oloibon institution of the community regime has started to embrace the change and has been getting inclusive and is evolving to reflect the demands for inclusion of diverse groups and on resource use like inclusion of National Government (NG) officers, the elite and politicians from both county and NG and youth leaders in the Oloibon committee membership. The institution will need support to build on the best of their traditions and adapt them to current conditions as part of the process to make it appropriate.

The government regime was good for biodiversity conservation but not preferred as it had failed to give livelihood benefits and opportunities to communities. Though it was command and control, this was not exclusive since The Wildlife Conservation and Management Act, of 2013 has opportunities for allowing community participation and sustainable utilization such that the community can enjoy a stream of benefits. Therefore, government management approach is good only that the stakeholders need to take full advantage of the law. The local technical officers need to realize that they “the local state” and have to remain key actors whenever community require

collaboration approval or good will of the State. This will enable communities' to access livelihood resources in KFNR.

Participatory Forest Management has improved community livelihoods and increased revenue collection. This is a possibility of interesting government to increase support to decentralization. This study clearly shows that decentralized forest governance was being practiced in the PFM regime. The regime was drifting towards devolution, as the communities and other stakeholders in addition to having legally defined forest management activities, they are continually negotiating for more rights as a way of enjoying the expanded bundle of rights. This was because PFM allows for: wide stakeholders and community involvement in forest management; promotes a sense of forest resources ownership among the communities; ensure no stakeholder has exclusive right over the resource or to exclude others from resource access; ensure powers are assigned to the various levels of government and other stakeholders legally.

The PFM practice was well supported by the Constitution of Kenya, 2010, The Forest Conservation and Management Act, 2016; The Draft National Forest Bill, 2015; National Forest Programme, 2016, an informed citizenry and global conservation trends. The practice fits in a decentralization model where powers are equitably distributed, local forest users are assigned defined rights and responsibilities, and adequate capacity is built for all parties. Decentralization (PFM) emerges as the most feasible approach to achieve as it relocates power and resources from officials at the centre to the periphery. The State does not lose any right in either of the three governance regimes because the National Government would continue to exercise ownership right over the resource and conferring usufruct rights to various stakeholders. The State would protect its stake by holding the land for itself and only

conferring management rights to the local community. Under PFM practice, the State has conferred to the community limited rights to exclude others and no right to extinguish and alienate but confers management rights and not ownership. This practice is applicable in all the other regimes and affirms this study's premise that all the governance types are appropriate in their context. Therefore, decentralization implemented under the framework of the PFM regime has a higher chance of success as it provides communities with the legal and political authorities needed to enforce rules and systems formulated by the stakeholders.

5.4 Recommendations

The key issues to enhance efficiency of decentralization are guided by observations of Borrini-Feyerabend et al. (2013), that over the past decade there has not only been a significant increase in the number of protected areas around the world, but also a dramatic change in understanding about how protected areas can and should be governed and managed. Along with familiar State-run protected areas, managed by government employees, we now have protected areas established and managed by various entities including indigenous people, local communities, eco-tourism groups, trustees, companies, individuals and religious organisations. From the study, below are key recommendations for enhancing decentralization of forest governance:

1. Enhancing awareness creation, information sharing and training to support implementation of decentralization in the forest sector.
2. Implement decentralized forest governance in a phased gradual manner and ensure adequate budget allocation, capacity building and organizational reform.

3. Adopt and adapt decentralization process to local contexts and develop the flexibility to fit different situations and changing circumstances through development of democratic resource management bodies which may be new organisations or the adjustment of traditional organisations to take over management responsibilities and represent stakeholder interests.
4. Enhance decentralization contribution to forest conservation and improved community livelihoods.
5. Institutionalize good governance practices to the forest sector supported by improved transparency and accountability so as to have better community and other stakeholders' involvement and governance structures, support clear mechanisms for benefit sharing and community involvement in decision-making process on the use and management of forest resources.
6. Recognizing and supporting indigenous/traditional governance systems as the governance type in Loita and support to adapt to modern socio-economic challenges to facilitate inclusive and incentive driven approaches to environmental management for both social and environmental sustainability.
7. Provide alternative forest products to households which are non-forest based like bio-gas which is cheap and for which the raw materials are abundant to reduce their over-reliance on forest products.

5.5 Further Research

There is need for further research on decentralization realizing that it is a dynamic process that requires constant learning and experimentation to understand: the role of none State actors in decentralization; how decentralization should be undertaken in plantation forests; how "decentralization" should be undertaken under the community

regime for sustainable forest management; costs and benefits of decentralization in forestry and how to enhance the role of communities in forest management under the PFM and the government regime.

There is need to undertake a study on ethnographic survey to understand the management system in Loita with a view to developing a forest management system for forest under similar management arrangement and guide policy development to support the management regime. A study to determine the effect expanding farming and increased settlement in Loita forest is urgent. This will create awareness on degradation levels and the need to develop an adaptive forest management system.

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APPENDIX I QUESTIONNAIRE FOR INSTITUTIONS (POLICY-MAKERS)

Introduction

I'm a postgraduate student of Kenyatta University registered for a Ph.D degree programme in the department of Environmental Sciences in the School of Environmental Studies. I'm conducting research for a thesis entitled "**Impacts of Decentralized Governance on Forest Conservation and Community Livelihoods in Kakamega and Loita Forests, Kenya**" This information would be used for research purposes and respondents would be kept anonymous. Any assistance will be highly appreciated.

Section A Administrative

Qs No _____

Interviewer Name: _____ Date: _____

Interview duration: Start _____ end _____

Section B General Geographical Information

County: _____ Sub County: _____ Town: _____

Section C General characteristics of respondent

1: Name: _____ Position: _____

2: Age of respondent (please √)

Younger than 20	20 - 30	31 - 40	41 - 50	51 - 60	Older than 60

3: Sex (please √): Male: ____ . Female: _____

4: Type of organisation: _____ Major activity: _____

5: Mandate of organisation _____

Section D Forest Management and Governance system

6: What are the forest management approaches being practiced in Kenya?

7: Which of these are the best and why? _____

8: What is the level (Tick \surd) of involvement of community in forestry management?

High		Moderate		Low		No involvement	
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9: Are you satisfied with the above? Yes No

10: If No; What can be done to improve the above scenario? _____

Section E Decentralization (i) Forest Conservation and Community Participation

11: What do you consider to be the first step of the decentralization process in Kenya and when was it taken?

12: What are the indicators of forestry decentralization in Kenya?

13: What are the indicators of decentralized forest governance? _____

14: Which decentralization types are being implemented in the forest sector? _____

15: (a) Has decentralization led to better forest conservation? Yes No

15: (b) If yes How _____

15: (c) If no' why? _____

16: How is decentralization affecting forest management in Kenya?

From an institutional and legal point of view, who supervises the decentralized entities at

Decentralization level	Officer responsible
Ministry level	

Headquarters level	
Forest level	
Regional level	
Community level	

In order to fulfil their duties, do the decentralized entities at the intermediate (Forest station, Zonal and Conservancy) level have various resources to effectively undertake decentralization (Tick appropriately):

Decentralization aspect	Range			
	Fully satisfactory	Sufficient	Insufficient	Not at all
Financial resources	Fully satisfactory	Sufficient	Insufficient	Not at all
Human resources	Fully satisfactory	Sufficient	Insufficient	Not at all
Autonomy to utilize forest resources	Strong	Sufficient	Insufficient	Not at all

(c): From an institutional and legal point of view, who has authority to make decisions over forest management?

Decentralization level	Level of authority (weighty score 1 highest and 5 lowest)
Ministry level	
Headquarters level	
Forest level	
Regional level	
Community level	

17: Which of the below types of decentralization type best describes the decentralization regime in the forestry sector in Kenya: (score rank: 1 for the type of decentralization which seems to have the most (positive) impact on forestry management in Kenya, 2 for the second most among)

Decentralization regime	Score
Deconcentration of central government services	
Delegation of power to parastatal bodies	
Devolution of power to local administrative units	
Devolution to civil society organisations	

18: Was the decentralization process accompanied by a restructuring of the Ministry terms of:

Reorganisation of services	
Budget	
Personnel	

19: If we consider the four levels [national, regional, station, and local (community)], what are the services of the Ministry of Forestry and Wildlife which correspond to the intermediate and local level?

National level	
Regional level	
Local level	
Community level	

20: What is the degree of involvement (rank from 1-highest involvement to 4 lowest involvement) in the formulation of forestry policies?

According to the institutional and legal requirement:

	Decision-making power	consultation and joint decision-making	consultation only	no consultation
National				
Regional				
Station				
Community				

According to your opinion and in practice:

	Decision-making power at local level	consultation and joint decision-making	consultation only	no consultation
National				
Regional				
Station				
Community				

21: In your opinion (Tick \surd), do forestry policies and legislation take into consideration the differences between:

Regions conservancies

Fully		Sufficiently		Insufficiently		Not at all	
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Conservation status of forests (level of degradation)

Fully		Sufficiently		Insufficiently		Not at all	
-------	--	--------------	--	----------------	--	------------	--

(c) Forest type

Fully		Sufficiently		Insufficiently		Not at all	
-------	--	--------------	--	----------------	--	------------	--

(d) Community livelihoods

Fully		Sufficiently		Insufficiently		Not at all	
-------	--	--------------	--	----------------	--	------------	--

22: In the forestry sector at which level (Tick \surd) are the following decisions concerning forest management made:

Type of decisions	Decision-Making level		
Financing is done mainly at	national level	regional level	local level
Follow-up and evaluation are done at	national level	regional level	local level
Employment decisions	national level	regional level	local level
Deployment decisions	national level	regional level	local level

23: In Kenya, who is responsible (tick \surd) legally for providing the following forestry support services?

Organisation	Service					
	Training	Extension	Research	Credit	Inputs	Forest benefit to community
Public sector						
Private sector						
Producers' organisations						
NGOs						
Church						

24: In Kenya, who is responsible [please tick \checkmark (in practice)] for providing the following forestry support services?

Organisation	Support service					
	Training	extension	research	Credit	inputs	Forest benefit to community
Public sector						
Private sector						
Producers' organisations						
NGOs						
Church						

25: In the forestry sector who has authority (tick \checkmark) to decide in terms of different forestry support services

Organisation	Support service						
	Policy formulation	training	extension	Research	credit	inputs	Forest benefit to community
National							
Regional							
Local							
Community							

26: In your opinion (Tick \checkmark), decentralization in the forestry sector was accompanied by:

Dissemination of information on decentralization to

Service	Rating			
	strong	sufficient	insufficient	none
Central technical services				
Deconcentrated technical services				
Officers and representatives of local administrative units				
Community or their representatives				
NGO				

Training for new tasks arisen from decentralization in the forestry sector to

Management level	Rating			
	strong	sufficient	insufficient	none
National level				
NGOs/service providers				
Officers and representatives of local administrative units				
Community and/or their representatives				

27: In your opinion, what are the additional resources to support implementing decentralization process in the forestry sector in Kenya to?

27: (a) To government _____

27: (b) To community _____

27: (c) To other stakeholders _____

28: List the benefits of decentralization process in the forestry sector in Kenya?

29: What recommendations can you make in order to improve the efficiency of the decentralization process in the forestry sector in Kenya? _____

30: How would you rate the overall effectiveness of decentralization on day-to-day Forestry management in Kenya _____

31: Do you feel that there is a clear understanding by the officers in the field at exactly what level they can make decisions? Yes No

32: Do you feel that field officers have taken decentralization beyond what was originally expected Yes No

33: As a result of decentralization which of the following (Tick \checkmark) applies regarding how well informed you are on the activities that are occurring within your command?

More informed		Less informed		No change	
---------------	--	---------------	--	-----------	--

34: How has the following aspects of management been impacted by decentralization

Management aspect	Score (1=improved; 2=declined; 3=not changed)
chain-of-command	
Accountability	
ability to initiate discipline	
Community livelihoods	
Forest Protection	
Partnerships	

35: What are the negative outcomes of decentralization on the forest sector?

Section F Decentralization (ii) Improved community Livelihoods

36 (a): Has decentralization improved community livelihoods? Yes No if yes how?

36 (b): If no why? _____

37: What can be done to improve it? _____

38: Has decentralization improved revenue collection for State? Yes No
If Yes; by what percentage? _____

39: If No how can it be improved? _____

40: Which community livelihood activities are attributable to decentralization?

41: How has decentralizations affected the following forest governance factors for improved livelihoods and better forest conservation

Community access to resources	
Participation in regulation making	
Participation in management decisions	
Access to information	

42: According to your opinion, are you satisfied (tick \surd) with how decentralization has achieved its objectives in the forestry sector?

Very satisfied		satisfied		Low		Very low	
----------------	--	-----------	--	-----	--	----------	--

44: What is your satisfaction rating (tick \surd) of decentralizations' meeting the States objectives for decentralization?

Fully satisfied		satisfied		No change	
-----------------	--	-----------	--	-----------	--

45: Any other comments

APPENDIX II QUESTIONNAIRES FOR HOUSEHOLDS

Introduction

I'm a postgraduate student of Kenyatta University registered for a Ph.D degree programme in the department of Environmental Sciences in the School of Environmental Studies. I'm conducting research for a thesis entitled "**Impacts of Decentralized Governance on Forest Conservation and Community Livelihoods in Kakamega and Loita Forests, Kenya**" This information would be used for research purposes and respondents would be kept anonymous. Any assistance will be highly appreciated.

Section A Administrative No _____

Qs

Interviewer Name: _____ Date: _____ Interview duration: Start _____ end _____

Section B General Geographical Information

County: _____ Sub County: _____ Location: _____

Sub Location: _____ Village: _____ Town: _____

GPS; _____ Alt: _____

Section C General characteristics of respondents

1: Name: _____ Ethnicity: _____ Resident status _____

2: Age of household head (please tick ✓):

Younger than 20	20 - 30	31 - 40	41 - 50	51 - 60	Older than 60

3: Sex: Male: ____ . Female: _____

4: Name of household head (if different from respondent) _____
Age _____

5: Household Size: ____ No. of adults ____: Household head (tick ✓): Male ____ .
Female. _____

6: Marital status (tick ✓): Single ____ Married ____ Widowed ____ Widower ____ Divorced ____
Youth ____

7: Education status (tick ✓):

None		Primary		Secondary		Diploma		Graduate		Other	
------	--	---------	--	-----------	--	---------	--	----------	--	-------	--

8: How far is the household from the forest edge _____ km

9: Land use

Farm total size	Area under homestead	Area under crops	Grazing area	Area under trees	Tenure status	Mode of acquisition	

10: Land ownership : Communal: _____ Individual _____: Leased _____
 If individual with title Deed? Yes: _____ No: _____; How long in the farm (years) _____

11: Household head occupation: Main _____
 Others in order of preference;

12: List Household livelihood sources in order of importance and assign a monetary value

Livelihood sources	Value (% contribution to gross household income)	Approximate annual value	Was the source better or worse in 1990
Agriculture			
Firewood			
Timber			
Grass			
Farm forestry			
Remittance			
Borrowing			
Loans			

13: What are the household energy sources?

Type	Charcoal	Firewood	Gas	Kerosene	other	Has the source/s changed
Used						
Source						
% of use 2010						
% of use in 1990						

Section D Forest Management and Governance system

14: Which forest management approach is applied in Kakamega/Loita forest?

15: What has contributed to this management approach being practiced?

16: What rules on forest management and utilization rules (a) most affect you negatively? _____

16: (b) Most affected you positively _____

17: How have these rules changed over the years? _____

18: Are you aware of The Forest Act 2005 Yes No ;

19: How has The Forests Act 2005 affected the way you access and use forest resources in your area? _____

20: How were/are forests being managed?

Before 1990	At 2010	Causes for change

21: In Kakamega/Loita who decides:

Which management approach is to be applied	
Which organisation to protect the forest	
How to involve the communities	
Which fees to be collected from the forest	

How the revenues will be used	
What communities can get from the forest	
How local forest conservation rules are developed	
Who can be a partners in forest management	
Who approves projects	

22: (a) Is the household involved in the management of the forest? Yes No

22: (b) If yes; How? _____

22: (c) If No Why? _____

23: How frequently does the household participate in joint forest activities?

Daily		Weekly	Monthly		Others (specify		Cost (KES) of involvement	
-------	--	--------	---------	--	-----------------	--	---------------------------	--

24: Which joint forest activities is the household involved in? _____

25: (a) How do you rate (tick \surd) the household level of involvement in forest management?

Not satisfactory		Fairly satisfactory		satisfactory		Very satisfactory	
------------------	--	---------------------	--	--------------	--	-------------------	--

25: (b) Please give reasons for your choice _____

26: Which organisations are involved in the management of forests in your area? _____

27: How do you rate (tick \surd) the effectiveness of forest management by KFS, KWS or Oloibon?

Not effective (very poor)		Fairly effective (poor)		effective		Very effective	
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27: (b) Please give reasons for your choice _____

27: (c) If No how can it be improved _____

Section E: Forest Conservation

28: (a) How was the forest managed before? _____

28: (b) Is the forest better conserved now than before? Yes No

28: (c) If yes How? _____

28: (d) If No has this affected the household negatively and how? _____

29: How has your forest use changed overtime?

Forest products accessed (before 2000)	Forest products accessed (2010)	Reasons for change

30: List the forest products you use from the forest over time

Forest use/access (before 2000)	Value (KES)	Forest use 2010	Value (KES)	Reasons for change

31: Trees use and availability trend overtime

Forest trees used (before 2000)

Trees	Status	Reasons/mitigation measures

Forest trees used in 2010

Trees	Status	Reasons/mitigation measures

32: How has the forest condition (size and quality) changed over time?

Forest condition before 2000

Forest condition	Indicator	Reasons	Mitigation measures

Forest condition 2010

Forest condition	Indicator	Reasons	Mitigation measures

33: (a) Is better forest conservation important to the community? Yes No

33: (b) List the reasons _____

34: (a) Is the forest better conserved now than before Yes No

34: (b) If Yes; How? _____

34: (c) If No; Why? _____

35: What forest management costs does the household incur?

Management cost item (e.g. meeting, patrolling, CFA official etc.)	Cost value	Trend since 2000

36: Are you satisfied with the level of conservation Yes No

37: What is your level of satisfaction with forest conservation status?

Not satisfactory		Fairly satisfactory		satisfactory		Very satisfactory	
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Section F forest

38: How has the household benefits been changing overtime?

Benefit	Value (KES)	Trend since 1990	Reasons (Why?)

39: (a) What are the benefits the household get from the forest

39: (b) What is proportion of forest benefits to the overall household livelihood?

39: (c) How much is that proportion in terms of cash?

39: (d) Has this benefit been changing overtime?

Very significant		No change		Reduced	
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40: How can forest contribution to household livelihoods be improved further?

Livelihood aspect	Mean of improvement
IGAs e.g. Eco-tourism	
Benefit sharing	
Costs	
Access potential	
Forest products	

41: (a) Loita/Kakamega forest reserve was created 68 years ago. Do you think that this was a good thing to do? Yes No

41: (b) Why? _____

42: (a) How do you consider/rate the relationship between you and Kakamega forest reserve (forest and managers?)

Poor		Medium		Good	
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42: (b) Why? _____

43: (a) Do you feel that you get a fair deal from the Loita/Kakamega forest reserve? Yes No

43: (b) If Yes Why? _____

43: (c) If No, what could be done to make this a more equitable arrangement/fairer deal?

APPENDIX III FOCUS GROUP DISCUSSION GUIDE

I'm a postgraduate student of Kenyatta University registered for a Ph.D degree programme in the department of Environmental Sciences in the School of Environmental Studies. I'm conducting research for a thesis entitled "**Impacts of Decentralized Governance on Forest Conservation and Community Livelihoods in Kakamega and Loita Forests, Kenya**" This information would be used for research purposes and respondents would be kept anonymous. Any assistance will be highly appreciated.

(a) Focus Group Discussion - community

The discussion focused on:

1. The forest management systems or regimes
2. The stakeholders involved in forest management
3. The products accessed from the forest
4. The benefits communities get from the forest
5. The household cash income from the forest
6. The forest condition change over time
7. The causes of forest condition
8. Improving forest management

(b) Focus Group Discussion – Policy-makers

The discussion focused on

1. Forest management status
2. Forest management approaches being applied in the forest management in Kenya
3. Ways of improving forest management
4. Stakeholders involved in forest management in Kenya
5. Decentralization in the forest sector in Kenya
6. The objectives for decentralizing forest governance

7. Forest policy and legislation in Kenya
8. The impact of decentralization on forest management and community livelihoods
9. Forest decentralization models/regimes in Kenya

APPENDIX IV ECOLOGICAL DATA COLLECTION FORM

Form A Trees, shrubs and stumps

Forest: _____ Area/locality _____

Sheet _____ of _____

PT.NO: _____ Vegetation. Type. _____ Date _____

GPS E: _____ N: _____ ALT: _____

TEAM: _____

SPECIES	DBH	HT	STEM FORM	CANOPY STATUS	REMARKS

Form B Regeneration

Forest: _____ Area/locality _____

Sheet _____ of _____

PT.NO: _____ Vegetation. Type. _____ Date _____

GPS E: _____ N: _____ ALT: _____

TEAM: _____

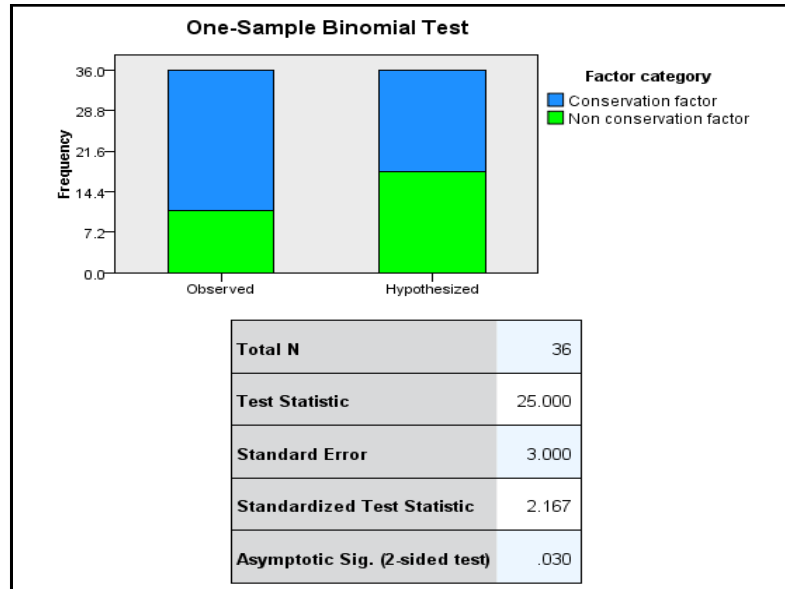
SEEDLINGS

SAPLINGS

SPECIES	TALLY	NO.	SPECIES	TALLY	NO.

**APPENDIX V ANALYSIS OF FACTORS THAT LED TO INITIATION OF
DECENTRALIZATION IN KENYA’S FOREST SECTOR**

**Appendix V (a) Binomial test of Conservation and Non-Conservation Factors for
Decentralization**

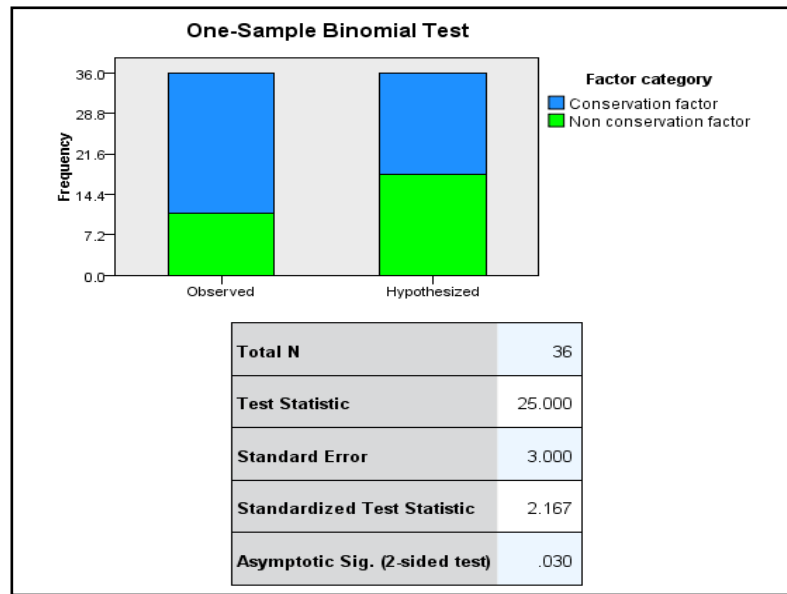


**Appendix V (b) Hypothesis Test Summary of Binomial Test of Conservation and
Non-Conservation Factors that Led to Initiation of Decentralization in Kenya’s
Forest Sector**

Null Hypothesis	Test	Significance	Decision
The categories defined by Factor category =Conservation Factor and Non Conservation Factor occur with probabilities 0.5 and 0.5	One sample Binomial test	0.03	Reject Null Hypotheses

**APPENDIX VI CONTRIBUTION OF DECENTRALIZATION TO FOREST
CONSERVATION AND LIVELIHOODS**

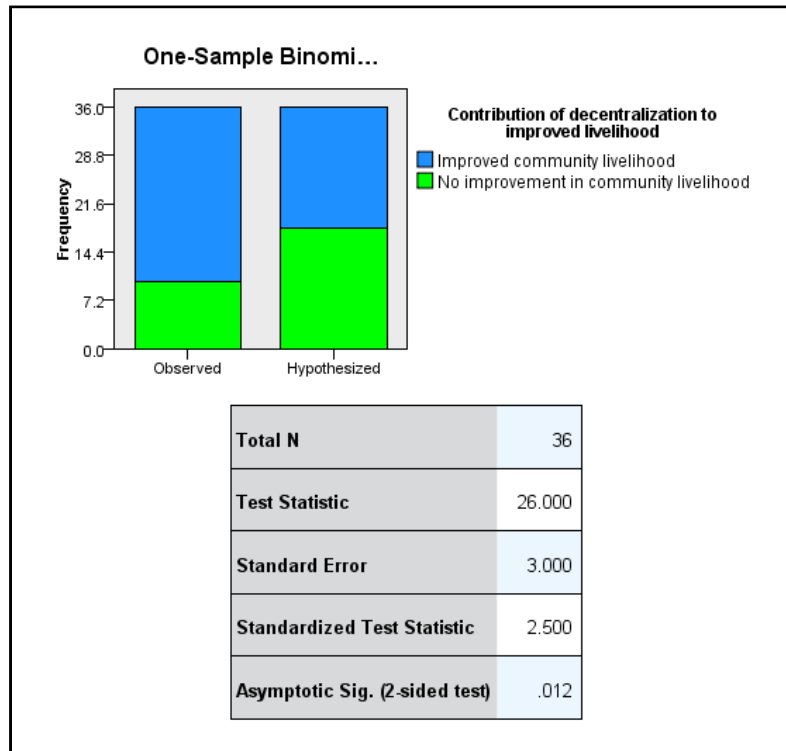
Appendix VI (a) Significant Contribution of Decentralization Processes to Better Forest Conservation



Appendix VI (b) Hypothesis Test Summary on Contribution of Decentralization Processes to Better Forest Conservation

Null Hypothesis	Test	Significant	Decision
The categories defined by Factor category =Conservation Factor and Non Conservation Factor occur with probabilities 0.5 and 0.5	One sample Binomial test	0.03	Reject Null Hypotheses

Appendix VI (c) Significant Contribution of Decentralization to Improved Livelihood



Appendix VI (d) Hypothesis Test Summary on Contribution of Decentralization to Improved Livelihood

Null Hypothesis	Test	Significance	Decision
The categories defined by Contribution of decentralization to improved livelihood = Improved community livelihood and No improvement in community livelihood occur with probabilities 0.5 and 0.5.	One-Sample Binomial Test	.012	Reject the null hypothesis
Asymptotic significances are displayed. The significance level is .05			