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(CASELAP)

ROLE OF TRADITIONAL FOREST CONSERVATION SYSTEMS IN SUSTAINABLE FOREST MANAGEMENT: A CASE OF THE KIPSIGIS SACRED HILL

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This Thesis is submitted in Partial Fulfilment of the Master of Arts in Environmental Policy at the Center for Advanced Studies in Environmental Law and Policy of the University of Nairobi.

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Declaration

Student's Declaration

This dissertation is my original work and has not been submitted for examination to any institution of higher learning.

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Opanga Valentine Date

Supervisors' Approval

This research project has been submitted for examination with our approval as the university supervisors.

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Prof. Nicholas Oguge Date

....

Dr. Elvin Nyukuri Date

Disclaimer

This document is about a study undertaken in partial fulfilment of the Master of Arts in Environmental Policy at the Center for Advanced Studies in Environmental Law and Policy, University of Nairobi. The views articulated in this document are exclusively the responsibility of the author. They do not essentially embody the position of the Center for Advanced Studies in Environmental Law and Policy nor that of the University of Nairobi on matters of forest conservation.

Abstract

Kenya continues to lose its forests despite developing relevant policies, legal mechanisms and institutions to curb this trend. Traditional Forest Conservation Systems (TFCs) are another alternative to conserve forests; these systems have been successful in sustainably managing different types of forests. However, there is intra-generational loss and none use of these systems of knowledge. This study therefore investigated how best we can meet the changing needs of the current and future generations without losing the benefits that Traditional Forest Conservation Systems have yielded over time. Specifically, it (i) examined the provisioning, regulating, cultural and support services provided by the forest to neighbouring communities; (ii) assessed how Kipsigis traditional forest conservation practices have affected provision of these services; and (iii) assessed how good practices from traditional forest conservation systems could be integrated into conventional forest conservation systems at county level. The study was cross-sectional and it utilized mixed methods of research. Respondents included 151 randomly selected households, 9 key informants and three Focus Group Discussions made up of 8 people drawn from the council of elders, women groups and youth groups. Key informants included, the Kenya Forest Service, National Museums of Kenya, Kenya Forestry Research Institute, the County Executive Committees on Water, Environment and Natural Resources; and Trade, Cooperative and Wildlife of Kericho County. The study found that first, the hill was still important to communities that live adjacent to it because they accrue a number of cultural, provisioning, regulating and support services from it. Secondly, that the TFCS activities directly depend on conservation of indigenous tress; loss of indigenous trees therefore equals loss of TFCS in Kericho County. Thirdly, Good practice analysis shows that the withdrawal of traditional leaders from forest management coincided with changes in forest cover, structure and land use; thereby leading to deforestation and forest degradation as exemplified by the Kaya and Loita Forests and Kipsigis Sacred Hill. The study inferred therefore that TFCS are important in sustainable forest management. It recommends that good practices in TFCS should be assimilated in forest policies at county levels for sustained management of both exotic and indigenous forests. Moreover, these systems should be incorporated in contemporary systems of education; in this case, the council of elders should be involved in teaching this type of knowledge at schools- right from primary to tertiary level to prevent loss of this knowledge.

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List of Abbreviations

CBD	Convention on Biodiversity
CFA	Community Forest Association
CIDP	County Integrated Development Plans
CGK	County Government of Kericho
DPSIR	Drivers-Pressures- State-Impact- Response
EMCA	Environmental Management and Coordination Act
FGDs	Focus Group Discussions
FMP	Forest Management Plan
GDP	Gross Domestic Product
GoK	Government of Kenya
KEFRI	Kenya Forestry Research Institute
KFS	Kenya Forest Service
KSH	Kipsigis Sacred Hill
NCCAP	National Climate Change Action Plan
NFP	National Forest Program
PFM	Participatory Forest Management
SES	Socio-ecological Systems
SFM	Sustainable Forest Management
TFCS	Traditional Forest Conservation System
UNEP	United Nations Environmental Program
UNFCC	United Nations Framework Convention on Climate Change
UNFF	United Nations Forum for Forests

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CHAPTER ONE
INTRODUCTION

1.1 Background

Forests are multifunctional in nature; they provide regulatory services, provisioning services, cultural services, information services and support services (Ludeki et al, 2006). Regulatory services include controlling climate, flood controls, pests and diseases and water purification. Provisioning services include food, fiber, hereditary resources and crisp water. Cultural and information services include research services, spiritual services and aesthetic value and recreation. Support services include services such as habitats (Ludeki et al., 2006).

Forests provide about 40% of global renewable energy supply (da Silva, 2017). Approximately 2 billion people, especially those who live in rural areas, depend on wood fuel for cooking, boiling and warmth. Moreover, approximately 900 million people have jobs in the wood energy sector worldwide. In sub-Saharan Africa, the production of wood energy accounts for 50% of forest destruction and degradation (da Silva, 2017). According to Ongugo et al (2016), the area under indigenous forests in Kenya had decreased by 8.1% in 2016, yet forests account for 3.6% of the National Gross Domestic Product (GDP). Forests directly affect water dependent sectors such as agriculture, forestry, fishing, energy, hospitality, public administration and defence sectors which often contribute approximately 33-39% of the GDP (WAVES, 2016).

Key drivers of forest degradation in Kenya range from government practices such as clearing natural forests to establish habitats for the increasing population; low fees for logging and weak enforcement of laws and regulations; conversion of natural forests into lands for agriculture; land shortage, increase in population, traditional methods of forest clearing such as forest fires to charcoal burning (National Forest Program, 2016). Loss and degradation of forests often has negative effects on the economy. For instance, in 2010, deforestation caused Kenya to lose approximately US$ 19 million-2010 values- (WAVES, 2016).

Towards this end, Kenya has developed new and revised old policies, laws and regulations to curb the loss of forests. First, article 69(1) of the constitution of Kenya, 2010 emphasizes the development and management of the forestry sector through: sustainable management, maintenance, utilization, governance and preservation of the environment and natural resources, as unbiased distribution of the accumulating benefits; attaining and preserving at least 10% tree cover of the land area; protecting and enhancing intellectual property and indigenous knowledge; environmental impact assessment, audit and monitoring (GoK, 2010).

Secondly, Schedule 4 of the National Assembly provides for the devolution of forestry functions. Thirdly, sessional paper no.1 of 2017, the National Land Use Policy, introduces a number of initiatives to advance forest resources through integration of good management, transparency, and responsibility, fairness and poverty decline in the forestry sector. Fourth, the Sessional Paper No. 3 of 1975, the statement on the Future of Wildlife. Management Policy in Kenya, supported the preservation and restoration of forests and other water sources that are of significance to wildlife habitations. Lastly, Sessional Paper no.9 of 2005, a Policy Framework for the conservation and Management of Forests, proposes provisions applicable to management of all forests on public, community and private land. Good governance and equitable sharing of benefits are featured in the policy.

The application of good forest practices often leads to the protection of ecosystem functions, thereby maintaining a sustainable forest ecosystem (Putz, 1994). In Kenya, the management and conservation of forests is a devolved function; this is because most forests are found within communities. However, the conservation, protection and management of all public forests remains under national government within the Kenya Forest Service Department (GoK, 2016).

Sustainable Forest Management (SFM) entails managing forests in a manner that enhances economic, environmental and social values of goods and services of all types of forests for the benefit of current and future generations (PEFC International,2018). It is pegged on Sustainable Development Goals (SDGs) 15 - Life on land. These SDGs seek to end poverty, safeguard the earth and ensure that there is prosperity for all as part of the global development agenda. Goal 15 seeks to '*Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.'*

Since most forests are found within the community, it is not erroneous to say that communities have a significant role in their conservation, protection and management. At this level, indigenous knowledge is a key resource in decision making in natural resource management, food security, animal health and education (Gorjestani, 2000). It *'includes all forms of knowledge that enables a community to achieve stable livelihoods in their environment'* (UNEP, 2008). This type of knowledge is often passed from one generation to another through folklore, songs and oral education (Oguge, 2016). In some communities such as the Samburu, community elders are custodians of the knowledge and often enforce relevant laws through penalties. The knowledge, expertise, and these practices are produced from long-term interaction with community needs (Oguge 2016).

Moreover, systems of local knowledge have highly contributed to preservation and sustainable utilization of both direct and indirect ecological services in ecosystems, biodiversity conservation and maintenance of ecological goods and services, restoration of bio-cultural services and has ingredients of adaptive management (Pandey, 2014). For instance, the Samburu pastoralists have been able to adapt to different ecosystems because they have knowledge of environmental phenomena (Ayiemba, 1981). The Pokot have grazing management systems besides being able to master the knowledge of local plants species and their uses (Barrow, 1991).

Watts (2016) estimates that those forests that are managed by communities sequester up to 54,546 metric tons of carbon, a number that is four times the carbon that the world emits annually. Moreover, forests are better protected when communities' rights over them are secure. Therefore, if community initiatives are incorporated into management of forests, it will be the most cost-effective way to prevent degradation and protect forests from invasion. Wanza and Njuguna (2012) stipulate that different forms of culture amongst communities in Kenya embrace the environment in different ways. For instance, the Kaya forests are sacred to the Mijikenda, a community which occupies the Kenyan Coast. They have been successfully managed using traditional conservation methods. The Mijikenda cultural taboos forbid the cutting of trees and destruction of other forest vegetation. Due to their protected nature, these forests have been able to protect rare flora and fauna from degradation.

For the Kipsigis community, the Kipsigis Sacred Hill (KSH) is a site for religious and cultural purposes. The Kipsigis traditional rites, ceremonies and religion have also greatly influenced the management of forests around the KSH. This hill is part of the extensive Mau forest mountain chain; it is situated at the source of River Kipchorian in the South-Western bloc of the Mau forest. It is covered in thick tropical forests (Tirop, 2013) which harbour a variety of flora and fauna and is also home for human beings (Londiani PFM, 2012). It overlooks the Kericho-Nakuru Highway within the Londiani forest (Ngetich 2014). Conservation of the environment forms a crucial part of the Kipsigis way of life. These practices have been able to protect these forests from encroachment and degradation (Tirop 2013).

However, good practices from traditional forest conservation systems at community level, which would have long formed a framework for conservation and management of forests, are not well documented. Therefore, this kind of knowledge is on the brink of extinction (Mulenkei, 2000). Therefore, this research will draw and document success stories from the preservation of the Kipsigis Sacred Hill forest. The findings of this research will be used to

develop a framework for coordination of national and county government policies for forest management with traditional systems of forest management.

1.2 Statement of the Research Problem

Deforestation and degradation of forests continues to happen across the world at unprecedented rates. As of 2016, global tree cover loss was estimated to be 29.7 million hectares (Weisse and Goldman, 2018). This has culminated in biodiversity loss, water shortages and widespread environment-related conflicts (Parotta et al, 2016). Kenya's forest cover currently stands at 6.9%, (KFS, 2016) a figure that is below the required 10% by the constitution.

In a bid to attain the constitutional requirement, Kenya adopted international conventions and frameworks such as the United Nations Framework Convention on Climate Change, the United Nations Convention to Combat Desertification and the Convention on Biodiversity at the global level. The National Land Policy, the National Climate Change Act, the Forest Conservation and Management and Conservation Act and the constitution of Kenya, 2010 recognize the significance of traditional systems of forest conservation in the management of forests. Despite this, both exotic and indigenous forests continue to degrade while deforestation levels continue to increase. This is attributed to increase in population and changes in the use of land (Kissinger et al, 2012).

Traditional Forest Conservation Systems are alternative sources of knowledge that have been successful in sustainably managing different types of forests. In Kenya, these systems have been key in the management of some forests; for instance, the Ogiek have successfully used these systems to sustainably manage the parts of Mau forests that they inhabit (Gómez-Baggethun et al, 2013). Likewise, forests such as the Kaya forests in Coastal Kenya (Mutta et al, 2009) and Loita forests in Narok County (Maundu et al, 2001), have been managed successfully over time using these methods.

However, there is intra-generational loss of these systems of knowledge; only the older generation knows, understands, practices and complies with these methods. The younger generations are not taking it up anymore (Boafo et al, 2016). Therefore, there is need to conserve this type of knowledge. The collection, documentation, and adoption of good practices from traditional forest conservation from the Kipsigis community provides additional evidence to ensure sustainability in the use and management of forests and related benefits in Kenya.

1.3 Research Questions

This study addressed the following key question:

How best can the national and county governments meet the changing needs of the current and future generations without losing the benefits that Traditional Forest Conservation Systems have yielded over time?

Specifically, this study answered the following questions:

1. What ecosystem goods and services does the Kipsigis Sacred Hill provide to the adjacent communities?
2. How have the Kipsigis traditional forest conservation practices affected the provision of these services?
3. How can key lessons from Traditional Forest Conservation Systems be integrated into conventional forest management at the county level?

1.4 Objectives

1.1.1. Aim of the Research

To investigate how best national and county governments can meet the changing needs of the current and future generations without losing the benefits that Traditional Forest Conservation Systems have yielded over time.

1.1.2. Specific Objectives

1. To examine the provisioning, regulating and cultural services that the Kipsigis Sacred Hill forest provides to adjacent communities.
2. To assess how Kipsigis traditional forest conservation practices have affected the provisioning of these services.
3. To assess how good practices from Traditional Forest Conservation Systems can be integrated into conventional forest conservation systems at the county level.

1.5 Justification of the Study

The Kipsigis Sacred Hill is both a protected area and a sacred site for the Kalenjin community. Apart from being gifted with cultural and natural heritage potentials, it is a source of natural resources to communities that live adjacent to it. Moreover, little has been documented about its biodiversity, traditional forest conservation practices and their effects on the trends in utilization of forest resources. This study therefore served as a baseline study but also provide complementary information on the subject of the role of traditional forest conservation systems in sustainable forest management.

This study also sought to improve forest management in Kericho County. It is envisioned that the findings of this study will be upscaled to other counties in the country. Moreover, the suggestions of this study have added on to the current works on forest conservation as well as filled the gap in knowledge on the nexus between traditional forest conservation systems and Sustainable Forest Management.

1.6 Chapter Outline

This study is divided into four chapters: Chapter 1 consists of the Project Background. It looks at the background of the study, problematizes the study, sets research questions and objectives, justifies the study and explains expected outputs. Chapter 2 analyses existing literature on the role of national governments in forest management and attempts to link traditional forest conservation systems with sustainable forest management, looks at the importance of forests in Kenya, analyses the legal and institutional framework for forest conservation and ends with a research gap. Chapter 3 describes Research Methodology adopted by the study. It defines the study population, outlines the methods of data collection and analysis of the data collected. Chapter 4 presents, interprets and analyses the findings in relation to literature. Chapter 5 provides a summary of the research and provides recommendations for policy makers and the community.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This section analyses literature on the importance of forests, policy framework for forest governance in Kenya; the concept of participatory forest Management; key stakeholders in the management of forests and traditional systems of forest management in Kericho County. This section ends with a research gap.

The economic advancement of any nation is founded on the environment and natural resources (UNFF, 2007). Forests are key national assets in Kenya. They serve numerous ecological uses which are crucial to the survival of human beings; these include regulatory services, provisioning services, cultural services, information services and support services. Regulatory services include regulating floods, climate, pests and diseases, water purification and air regulation.

Provisioning services include food, fibre, genetic resources and fresh water. Cultural and information services include research services such as spiritual resources and aesthetic value and recreation. Support services include services such as habitats (Ludeki et al., 2006). The forestry sector is intertwined with key sectors such as tourism, food security, timber production, water and production of non-timber products (UNFF, 2007).

2.1 Importance of Kenya's Forests

The definition of the term 'forest' is dependent on such factors as rainfall patterns, temperature, soil composition, latitude, and human activity. The globally agreed definition of what constitutes a forest includes trees of a minimum of 5metres, about 10 per cent crown cover where the thickness of the covering is determined by estimating the area of ground shaded by the crown of the trees, and a smallest forest area size which is 0.5 hectares (FAO, 2012). In the Kenyan context, it is defined as 'an area of land of an extra 0.5 ha, crown cover of 10%, trees of at least 2.5 m height, which is not under any agronomic or other non- forest land use (NFP, 2016).

Approximately 7.8% of the surface area of the world is covered by forests. The Global Forest Assessment Report of 2015 stipulates that forest goods and services are essential for life on earth, especially for human beings (FAO, 2015). Human beings accrue both direct and indirect services. Africa's forests embody roughly 16.8% of the global forest cover. Nevertheless, most of them have lost their structure, species composition, function and productivity (Scheliha et

al 2009). They continually face pressure from urban development, shift cultivation, natural disasters, infrastructure, logging, as well as from agriculture. Furthermore, only a few governments have invested enough in the preservation of forests. Loss of forests is also attributable to weak government organizations that are accountable for management of forest resources (Hogan, 2011).

Kenya's national forest cover in 2010 was 6.99% and protected forest areas cover about 3.2% of the total land area. Kenya has five different types of forests; they include lowland tropical rain forest in the western part of Kenya and montane forests which are located in the central and western moorlands and on higher hills and mountains. The montane forest ecosystems include the five major water towers: the Aberdare Range, Mount Elgon, Mau Forest Complex, Mount Kenya and Cherangani Hills. They represent the biggest tracts of high-canopy forests that form the foundations of most of the main rivers and are sources of essential wood and non-wood products (NFP, 2016).

Lowland tropical rain forests refer to forests that grow on flat lands at elevations that are less than 3,300 feet. They are taller and more diverse with fruiting trees and large who are adapted to feeding on these fruits. In Kenya, they include forests such as Kakamega forest. They have more suitable soils for agriculture and contain hardwoods that are valuable for timber hence they are under threat from anthropocentric activities (Butler, 2012). These forests also play a key role in absorbing carbon dioxide, a greenhouse gas that contributes so much to climate change and they also produce oxygen upon which life on earth depends. Montane forests such as the Mount Elgon, Aberdare Range, and Mount Kenya, Mau Forest Complex and the Cherangani Hills (Peltorrine, 2012) represent Kenya's five major water towers, which produce more than 75% of renewable surface water resources. This water supports water dependent sectors such as fishery, forestry, agriculture, manufacturing, electricity, the hospitality and the defence sectors (UNEP, 2012).

Coastal forests include coral rag, mangrove forests and other coastal forests. Forests such as Shimba hills and Taita hills forests are important because there is high biodiversity and endemism within the forests. They are also a source of medicine for the local populations, fuel, construction materials, foodstuff and they preserve a steady supply of water for townships and nearby communities (TFCG, 2006). Riverine forests such as Galana, Ewaso – Ngiro, Tana and tributaries, Turkwell and Kerio in Kenya are thick forests, which are used for timber, firewood, fodder and browse for livestock; supports biodiversity and wild animals. They also act as

carbon sinks, they regulate climate, prevent soil erosion and also protect soil and habitats from the ferocity of flood waters.

2.1. Policy Framework for Forest Management

Africa is rich with numerous natural resources; while some of them are under the national and county governments, others remain in the hands of the community. Most of the African countries have become aware of the role of the community in managing forests and thus are decentralizing forest management (Agrawal et al, 2008). This has been done in a bid to bridge the gap between forest conservation and meeting livelihood needs but at the same time improving peoples' living, alleviating poverty and preservation of the condition of forests (Ogada, 2012)**.**

2.1.1. International Conventions and Agreements

All national legal and policy framework in Kenya is built upon international conventions and agreements. Kenya has ratified numerous convention and agreements that protect forests. First, the Convention on Biodiversity accommodates the practical utilization of components of the organic differing qualities and reasonable and fair distribution of benefits from the utilization of genetic assets. The CBD does not provide for the protection of forests from degradation. Nevertheless, deforestation has become a priority subject for the Conference of Parties (Hague Ministerial Declaration (para. 13). This convention has impacted international discourse on forests, supports traditional forests-related knowledge of indigenous individuals and forest dependent groups (CBD, 1992).

Secondly, the Forest principles, established on 1992 in Rio de Janeiro, played a key part in fostering the comprehension of the concept of Sustainable Forest Management (SFM) at the time. It has since produced criteria for assessing the accomplishment of SFM at the worldwide, local, nation and management unit level (Forest Principles, 1992). Thirdly, the Non-Legally Binding Instrument on All Types of Forests, which was approved by the United Nations General Assembly in December, 2007 seeks to ensure political commitment and action to sustainably use and conserve forests of all sorts to attain the universal goals on forests; to improve contributions of forests towards Millennium Development Goals particularly on the eradication of poverty and environmental sustainability (UNGA, 2007)

Fourth the Protocol to the United Nations Framework Convention on Climate Change (UNFCCC) which was taken on at the third sitting of the Conference of the Parties (COP 3) which was held on 11th December in Kyoto, Japan hence the name the Kyoto Protocol. Ratified

on February 25, 2000, the Protocol obliges countries, whether developing or developed to encourage sustainable management and utilization of forests and also cooperate with each other in the conservation of forests as sinks and reservoirs of greenhouse gases. Article 4(1e) of UNFCCC mandates that all signatories cooperate in the protection and rehabilitation of arid and semi-arid and drought-stricken areas (UN, 1998).

Fifth, the Convention on International Trade in Endangered Species (CITES) protects forests from deforestation by limiting trade in some tree species. Sixth, the Ramsar Convention touches on forest conservation. The convention mandates that the parties conserve wetlands, including those that are in forested areas. This de-facto addresses the issue of deforestation. Lastly, the International Tropical Timber Organization (ITTO), which was established under the International Tropical Timber Agreement (ITTA) and ratified in 1985 was sponsored by the United Nations Conference on Trade and Development. This agreement aims to stimulate sustainable management of forests that produce timber; legal harvesting of timber producing trees and the divergence of global trade in lumber from these forests (ITTA, 2006).

2.1.2. Forest Policies at National Level

For a very long time, Kenya has been working to come up with policy that would ensure that forests are utilized sustainably. The White Paper no.85 of 1957 developed forest principles which include management, employment, finance, industry, reservation, African areas, protection, private forests of any forests that were not owned by the state, public amenity and wildlife, research and education (GoK, 2011). The first forest policy was established in 1968-session paper 1 of 1968-. Between 1994 and 2009, the 1968 forest policy was revised against the Kenya Forest Master Plan which resulted into the 2009 Forest Policy Draft (GoK, 2011). This policy was revised, thereby resulting into the Draft National Forest Policy, 2016 which underscores the significance of traditional knowledge in the management of forests.

Kenya has also developed a National Forest Program (NFP) (2016-2030). The NFP forms a strategic supportive basis for executing the principles and values of the Constitution and of Vision 2030. Its objective is to enhance social, environmental and economic sustainability in the Kenyan forest sector by increasing forest/tree cover and reversing forest dilapidation; improving forest-based monetary, communal and ecological benefits; enhancing capacity development, research and adoption of technologies; increasing investments in forest development and integrating national values and principles of good governance in forest development (NFP, 2016).

Chapter five of the constitution of Kenya (2010) is dedicated to preservation and sustainable utilization of land and the environment. The state is obliged to safeguard sustainable use and management, protection and equitable sharing of the benefits of natural resources (Article 69, GoK 2010). Schedule four of the constitution, which explains the duties of the national and the county governments, places community forests under the county government management while the public forests are under the national government. Article 162 (2b) establishes an Environment and Land Court which deals with matters related to environmental use and the title to land and occupation.

The Environmental Management and Coordination Act (EMCA) 1999-Now EMCA Revised, 2015- establishes the lawful and institutional basis upon which Kenya could realise a clean and healthy environment. With regards to sustainable management of forests, the EMCA stresses the sustainable use of hilltops, hillsides, mountainous sides and forests. It also limits harvest of such forests. The Act also imposes an ecological Conservation Order on burdened land to conserve plants and animals, any outstanding ecological, archaeological and geological features (GoK, 2015).

Vision 2030, Kenya's sustainable development blueprint, is Kenya's reference point for macro and micro economic development planning. It is implemented in successive 5year medium-Term Plans. It provides for sustainable exploitation of natural resources like forests. In the National Climate Change and Response Strategy, forestry is identified as a key sector in the implementation of climate change mitigation action plans. Climate change impacts affects natural systems e.g. forests and land use. It enlists impacts of forests in climate change mitigation and therefore recommends restoration of forest cover, development of renewable energy sources and use of mechanisms such as carbon markets and clean development mechanisms to mitigate the effects of climate change (GoK, 2010).

The National Climate Change Action Plan (2013-2017) promotes of agroforestry, restoration of mangroves and planting flora to stop erosion of riverine and lakeshores. It also promotes afforestation and reforestation programs. It seeks to establish an additional 4.1million hectare of land over forest cover. It provides for protection and conservation of all forest types by actively involving key stakeholders in the forestry sector (GoK, 2013). The National Land Use Policy, 2017, provides guidance to matters related to management and conservation of land based natural resources e.g., forests. It also provides for cross-sectional harmonization and collaboration in sectors like agriculture, water, forestry and wildlife which are important in addressing forest degradation and deforestation (GoK, 2017)

Forests account for 45% of biomass energy and wood wastes in Kenya. Most populations in the rural and urban areas depend on wood fuel and charcoal for energy. Therefore, energy production is a key driver in deforestation, climate change, and soil erosion. The National Energy Act (Revised, 2012) encourages utilization of renewable sources of energy exclusively via agroforestry, utilization of fast maturing trees for production of energy e.g. biofuels and formation of woodlots such as peri-urban farmsteads. It also promotes agroforestry and community forestry programs to increase the percentage of forests on farms to replace degraded forests (GoK 2012).

The Draft National Environmental Policy, 2013, contains provisions related to the sustainable utilization and management of natural resources and ecosystems. It provides for a holistic approach to the administration and consolidation of legal and organizational bases for effective harmonization and promotion of the use of environmental management tools such as Payment for Ecosystem Services (PES). The policy provides for development of national strategies that will forest cover from the existing 6.9% to the constitutional requirement of 10%. It also promotes conservation of water catchment areas and development and implementation of cost effective, impartial and quantifiable nationwide ideals, doctrines and measures for sustainable management of forests (GoK, 2013).

The Draft Forest Policy 2014 links sustainably managed forests to poverty reduction. It promotes the involvement of communities, the private sector and other key actors in forest management, preservation of water catchment areas and decision making. In the spirit of attaining the constitutionally required 10% forest cover, the Draft Policy promotes farm forestry for harvesting of lumber, fuel and other forest products. It also provides for conflict intervention mechanisms when disagreements between forest managers and communities that live near forests arise. It also promotes dry land forestry for production of wood fuel and supply of wood and non-wood forest products (GoK, 2005).

The Kenya National Biodiversity Strategy and Action Plan, is the national framework for the implementation of the Convention on Biodiversity. It provides for the conservation of forests in protected areas, arid and semi- arid areas, indigenous systems and indigenous knowledge on forest conservation and management. The Forest Regulations on Charcoal, 2009, legitimize the sustainable production of charcoal, sustainable use of forest areas, control harvesting of forests to protect water catchment areas. (GoK, 2009). Forest Conservation and Management Act, revised- 2016 gives effect to Article 69 of the Kenyan Constitution, 2010, with regards to

forest management. It provides for sustainable development of all forest resources for development of the social and economic sectors of Kenya (GoK, 2016).

2.2. Forest Conservation and Management at County Level

With regards to forest conservation and management, the Fourth Schedule of the Kenyan Constitution states that the county government is charged with ensuring implementation of national government policies on conservation of forests and also making sure that there is participation in decision making and management of forests (GoK 2010).

The County Government Act of 2012 gives effect to the Fourth Schedule of the Kenyan constitution. Under Art 50 (3a), the Act gives the sub-county administrator the powers to coordinate, manage and supervise development of policies and plans, and to facilitate and coordinate participation of citizens in development of policies and plans and delivery of services under Art. 50 (3g). Moreover, under Art 3 (g), the county is in charge of ensuring that community and cultural diversity of a county is reflected in its county executive committee as contemplated in Article 197 of the Constitution (GoK, 2012).

The County Integrated Development Plan (CIDP) is the main policy document for development in Kericho County. The CIDP enlists that Kericho County accrues timber, honey, grass herbal medicine, firewood, building materials, pottery soil, and pine gum from forests. It also states that the main beneficiaries are those that live adjacent to them and farmers who practice agroforestry. Trees have also been used as carbon sinks, for beautification of highways, as silage for livestock and for medicinal purposes (CGK, 2013).

The Kericho CIDP enlists key drivers of deforestation as demand for wood fuel by tea processing companies such as Kenya Tea Development Agencies, national, private and multinational tea factories. Additionally, 80% and 14.4% of Kericho county residents rely on wood fuel and charcoal respectively for their energy needs. Moreover, there have hilltops have also degraded especially at lower attitudes. Degradation of water catchment areas is attributed to introduction of Eucalyptus trees along river banks. As part of a process to foster participatory forest management, the CIDP notes the need to decentralise structures to effectively address environmental issues at lower levels (CGK, 2013).

In its spatial plan, Kericho County proposes to roll out reforestation programs through establishment of tree nurseries in degraded areas, planting trees in public institutions and along river banks and promotion of agroforestry. In a bid to reduce deforestation, the spatial plan

promotes alternative sources of livelihood such as training farmers and those that depend on forests in beekeeping, rabbit keeping (CGK, 2013).

Key actors in the forest management include Community Forest Associations (CFAs), the Kenya Forestry College and the Kenya Forest Service. The county government:

> (a) shall implement national policies on forest management and conservation; (b) shall manage all forests on public land defined under Article 62(2) of the Constitution; (c) shall prepare an annual report, with the approval of the County Assembly, for the Service on the activities of the county government in relation to this Act and any national policies on forest management and conservation; (d) shall promote afforestation activities in the county; (e) shall advice and assist communities and individuals in the management of community forests or private forests; and (f) may enter into joint management agreements with communities or individuals for the management of community forests or private forests (Article 21. GoK 2016)

CFAs were created to foster community participation in forest conservation and management. Under the Forest Conservation and Management Act, management of forests is decentralised through institutions to balance control of forests between the central government, the county government and the community. According to the Forest Act, 2016 they are supposed to collaborate with the Kenya Forest Service to establish county forest management plans. They assist the KFS in implementing rights and regulations as provided for under the Act (GoK, 2016)

At the county level, the Kenya Forest Service is charged with the conservation, protection and management of public forests; prepare and implement forest management plans for all public forests; receive and accept licences and permits; establish and implement benefit sharing agreements; assist in building capacity of forest managers at county level and approve credit facilities and train forest industries that are based at the community level (Article 8. GoK, 2016).

The role of Kenya Forestry College at this level is to provide education on forests; professional and practical training courses in forest conservation, management and protection of forests and other natural resources, develop training programmes in forest management and utilization, develop training programmes to support traineeship and professional training in the forest sector (Article 18. GoK, 2016).

2.3. Policy Coordination at the National and County Government Levels

A county is a single geographical unit headed by an elected governor that is made up of several subdivisions known as wards that are headed by an elected ward representative known as the Member of the County Assembly (MCA). The day to day management of key sectors in the

county is accomplished by the County Executive Committee which is selected by the governor and ratified by the county assembly. There are also several nominative positions in the county assemblies that include nominated seats for marginalized groups and special seats to ensure the two-third gender rule is observed (GoK, 2012).

Under the Kenyan constitution, county governments have been granted the authority and responsibility to plan the development of their county according to local needs and priorities. County governments have the mandate to prepare County Integrated Development Plans (CIDPs), as the basis for their planning and budgeting process. The Kenyan constitution (Art.29) recognizes the differences between the national and the county levels of governments to conduct their relationships on the foundation of cooperation and collaboration. Art.189 mandates both the county and national governments to link with each other for the purpose of information exchange, coordination of policies, management and enhancing capacity (GoK, 2010).

The county government is charged with functions such as developing policies and bills at the county level. However, there is a lack of coordination of policies between the county and the national government level. Rao et al (2014) argue that '*fiscal decentralisation and authority to make decisions on the management, application of, and accountability* for' these fiscal resources are some of the key enablers for better coordination. In Kenya nevertheless, the agenda of fiscal decentralization is characterised by disputes, power struggles between national and county governments over distribution, mobilisation, and accountability over these resources (Ochieng, 2017).

Therefore, there is need for the county government and the national governments to take up the initiative to provide coordination and to strengthen the subnational level. There is need to also strengthen the capacities of the county government to develop plans that integrate traditional forest management systems into forest management policies, plans and strategies and link these to the national priorities and targets.

2.4. Participatory Forest Management

For a very long time, community participation in matters forestry was limited to forest workers or cultivators who were paid to do the job. Forests were controlled by forest guards whose role was to ensure forest health through exclusion and through activities that are approved by the Forest Department (GoK, 2011). Although members of the community were key stakeholders in the forest resources, they did not sufficiently participate their management. This is because

the Forest Act at the time (Cap 358) and the 1968 Forest Policy did not recognize community participation as a viable option. The rapid decline in forests in the 1990s and 2000s was the basis upon which Cap 358 was reviewed; this resulted into the Forest Act 2005 which introduced the concept of Participatory Forest Management (PFM) (Mbuvi et al, 2009).

Participatory Forest Management was introduced due to pressure from the communities that live near forests, the civil society, research scientists and other groups who alternative approaches to eliminate the obliteration of forest ecosystems. This approach came about partly because there was a need to stop the increasing obliteration of indigenous and artificial forests that had been on the rise under the old forest policy and law; and partially by the need to involve the local communities in forest governance (Ongugo et al, 2007).

The New Forest Act of 2005 saw the arrangement of the Kenya Forest Service (KFS), a semi-independent government organization with representation from different government services. Under the Act, the KFS is relied upon to decline forces to the private part and to woods protection boards of trustees and Community Forest Associations (CFAs). Community support is accomplished fundamentally through CFAs, and incorporated administration of backwoods are focal standards persuading the new approach (Ongugo, et al., 2007). CFAs were formed by Kenya Forest Action Network (FAN) and the Kenya Forests Working Group (KFWG) through awareness creation amongst communities neighbouring the major forests. The Kenya Forest Service has also played a key role in establishing CFAs. These CFAs have not achieved their objectives since CFAs rely only on membership fee and payment by memberships as their core sources of monetary resources (Musyoki et al, 2016).

2.5. The Status of Traditional Forest Conservation and Management Systems in Kenya

2.5.1 Forests in Londiani

According to Hale, as long as people live near any ecosystem and have been utilizing its resources, there has been some form of resources management even if the systems are dormant and involuntary. This means that they have developed elaborate management and governance systems which have evolved into a sustainable and symbiotic relationship between the people and resources (Essington et al 2018; Hale et al 1998). Mau forest resources are important to adjacent communities as they contribute approximately 25-36.5% of annual income of these households (Langat et al, 2016). Therefore, there is need to ensure sustainable use and management of their ecosystem goods and services.

During the precolonial period, Londiani forest resources were successfully managed, utilized and conserved by regulations that were enforced by chiefs and community elders. In 1932, it was gazetted; the access and use of forest resources was under the colonial forester. During this period, indigenous trees were replaced with exotic plantations. This was the same method of forest management that was adopted by the government after independence. Consequently, the destruction and degradation of forest resources continued through the 1970s, 1980s and 1990s (Londiani PFM, 2012).

At the moment, many other tribes have settled around the forest; agriculture is their main economic activity. Furthermore, they continue to depend on forest products such as firewood, livestock grazing, beekeeping and water collection for both domestic and commercial purposes. Consequently, cases of illegal logging, especially of cedar posts have increased, thereby posing the greatest threat to this forest. Moreover, tree species such as *Juniperus procerus* have become extinct. Illegal charcoal burning, overgrazing, encroachment and illegal extraction of herbal medicine continue to threaten the existence of this forest (Londiani PFM, 2012).

This research will focus on the Kipsigis Sacred Hill. Also known as Mount Blackett or *Tulwoop Sigiis*, the Kipsigis Sacred Hill is a dome-shaped hill overlooking the Kericho-Nakuru Highway near Londiani. This hill has both social and religious incentives to the Kipsigis; along these lines, forests around it are managed and conserved under a customary framework. This hill is viewed as a holy place; a position of richness for harvests, domesticated animals and humankind. It goes about as a focal part for religious purposes, yearly thanksgiving and soul changing experiences functions (Ngetich, 2014).

In Folklore, the Kalenjin rested on this hill in the wake of getting away bondage from Egypt. Over a long period of time, the Kipsigis created developed positive attitudes towards their condition; distinctive types of their way of life grasp the earth in various ways. For example, plants and trees are of incredible hugeness in the Kipsigis people group; they are used for restorative purposes (Ngetich 2014; Peristiany 1939).

Additionally, the Kipsigis Supreme being is seen as powerful and is projected through trees; for example, the bamboo and the pordocapus trees are consecrated and are likewise utilized for cultural purposes. The council of elders forbade the cutting of tall trees; just little branches and grass are utilized to assemble houses. Besides, amid war, grass is an image of shelter. It is on this basis that that the Kipsigis would do all that they can to ensure the hill in all ways (Tirop, 2013).

2.5.2 Loita Forest

Also known as Loita Naiminia forest or forest of the lost girl, Loita forest is an upland forest directly adjacent to Maasai Mara. Loita forests are located near Narok South in Laikipia County. It therefore forms part of the larger Maasai Mara/ Serengeti/Ngorongoro ecosystem. It contains a large swamp with springs and rivers. The forest is used as a shrine, for livestock grazing and for initiation. The structure of forest governance is therefore managed by traditional forest governance systems. Land in Loita is owned communally and anyone can access resources anywhere in the land. Some cultural rites which require use of limestone are carried out within the forest. This limestone is found in some parts of the forest; these ceremonies are carried out inside the forest at places only known to traditional elders. These forests are surrounded by Maasai homes (Ongugo et al, 2013).

Throughout the dry season, the Loita forest is used as a grazing ground; grazing is limited during normal seasons. Firewood is obtained from the adjacent places where dry twigs are found in plenty. Each village has a designated area where they can collect firewood. In cases of houses construction, wood is obtained from any place in the forests but harvesting in large quantities of specific species, is prohibited by the elders. Non-timber forest products such as medicinal plants, honey etc. are in plenty and can be obtained freely from any part of the forest (Maundu et al, 2001).

The IUCN Report No.9 states that:

> "there is no environmental degradation, no erosion, no serious degradation of rangelands, no overstocking, no largescale agriculture, no severe encroachment in the forest, no commercial exploitation of the forest resources and no threat to the wildlife. There is still a well-functioning system of social control managing the use of the natural resources." The Report further states that "there is, presently, no legal opening which would allow the Loita community to have exclusive property rights or to independently manage their forest. Only a Presidential decree or the granting of the forest to the Loita people by the Narok County Council would make this possible, under the Local Government Act" (IUCN Report No.9, 1991).

2.5.3 The Kaya Forest

The Kayas are sacred forests are found at the coastal plains and hills of Kenya, especially in Kwale, Mombasa and Kilifi counties in coastal Kenya. The kayas are a biocultural heritage of the Mijikenda people of coastal Kenya from which they derive biological, cultural and spiritual goods and services. For a very long time, these forests have been sustainably managed by the Kaya elders through traditional conservation systems (Mutta et al, 2009).

The Mijikenda cultural taboos forbid the cutting of trees and destruction of other forest vegetation. Due to their protected nature, these forests were able to protect rare flora and fauna from degradation. However, Kaya forests have been disappearing at an alarming rate due to industrial demands and natural resources of a growing population in need of settlement and farmland, forest fires, and tourism which has increased demand in local heritage products. Moreover, the lack of documentation of local knowledge on conservation of the Kayas has contributed to the shrinkage of the forest. At the moment, this knowledge is held by a small group of elders since most Digos have intermarried with neighboring communities (Wanza and Njuguna, 2012).

2.5.4 Mau Forest

The Ogiek are indigenous people who live in different parts within Mount Elgon and the Mau forest ecosystem. Although they have added agriculture and cattle herding to their way of life, traditionally, the Ogiek are hunters and gatherers who depend on natural forests for their livelihood, spiritual and cultural services (Spryut, 2011). Forests have been conserved and managed since time immemorial. In a bid to effectively manage Mau Forest, each and every clan is awarded a forest bloc, which is demarcated by features such as hills, springs, streams and rivers. The land they occupy is held as sacred; it often shapes their knowledge systems, identities and their livelihood practices. Their beliefs, and cultural practices are pegged on forests' protection, conservation and utilization (Wittman and Geisler, 2005).

The community protects streams and rivers by warranting that no agricultural activities is done within fifty meters on both sides of the river (Wittman and Geisler, 2005). No one was allowed to cut trees and their use of the Mau forest complex resources was based on a seasonal calendar that described their practices within the forests. They have been able to use traditional climatic systems to classify wild animal, bee and vegetation types to different eco-climatic zones (OBCP, 2015). The Ogiek have continued on and battled against deforestation and forest corruption, and approaches and projects of governments and corporate interests that will dislodge them from their regions. This strong protection of forests is credited to their cultural and spiritual associations with their land even in the face of modernization (Gómez-Baggethun et al, 2013).

2.6 Research Gap

Anthropocentric activities are the leading contributors of forest degradation and destruction at alarming rates (GoK, 2015). Kenya continually experiences high rates of degradation of forests despite the government enacting laws and policies and launching strategies such as

participatory forest management. Therefore, there is need to strengthen these measures right from the community level since most people at this level rely on traditional methods of forest management. However, traditional forest conservation methods have not been fully embraced as a module to manage forests at the national level.

From the literature reviewed in this section, it is evident that there is scanty experiential information on the role of Traditional Forest Conservation Systems in Sustainable Forest Management in Kenya. Additionally, there is little documented evidence on coordination of legal framework between county and national governments. Moreover, these practices are not documented, they are passed by word of mouth. These practices are being abandoned yet this knowledge and institutions of this kind disappear at unprecedented rates.

2.7 Analytical Framework

This section focuses both on the theoretical framework and the conceptual framework. This research adopted both the Socio-ecological Systems (SES) theory and the Drivers-Pressures-State-Impact- Response (DPSIR) framework to analyse the role of traditional practices in sustainable forest management and put the Kipsigis Sacred Hill as the best practice case study in context.

2.8 Theoretical Framework

The Socio-Ecological Systems (SES) theory provides guidance to assess communal and ecological dimensions that contribute to sustainable use and management of resources. It stipulates that communities interact with different types of ecosystems on a daily basis have the most relevant knowledge of how best to manage these ecosystems. Therefore, socio ecological systems will benefit from a combination of these and other systems of knowledge. There is need to link different disciplines into a new body of knowledge that can be applied to these systems (Berkes et al, 2000).

Most forests in Kenya are greatly degraded and this is due anthropogenic activities. Comprehension of the procedures that prompt the strengthening or weakening of natural resources management is restricted and that the acknowledged theory has expected that natural resource users will never be motivated to take care of their forests. For this situation, governments must impose solutions to manage these resources (Ostrom et al, 2012).

However, in practice, some government policies alone do not often help in the conservation of certain natural resources; some policies accelerate resource destruction (Ostrom et al, 2012). In the case of Kenya, despite the creation forest policies, legislations and institutions for forest

management and ratification of various international instruments for forest management, forests continue to be degraded at unprecedented rates in Kenya. This demonstrates that existing plans cannot improve output, variety and resilience of forest ecosystems. Therefore, there is need to bring other state and non-state actors on board to achieve the intended results.

It is vital for drier and sub-humid forest ecological systems on which people depend for income. Forest management is one approach that can effectively modify the quality of services of the forest ecosystem by adding or subtracting biophysical inputs. Despite dissimilar aims by managers and owners, their major goal is to provide sustainable and necessary conditions and avoid unwanted ones (Hulme and Murphree 2014). Therefore, Kenya's policy makers and forest managers need to undertake an inclusive valuation of environmental and communal concerns when developing robust forest systems.

The SES theory helped explain how key institutions at county and national government level and other actors in forest management, social and ecological factors will have interacted over time to create incentives to overexploit or sustainably use forests, with a range of social and ecological outcomes. Therefore, social-ecological thinking has much potential to inform approaches for sustainable forest management.

2.9 Conceptual Framework

The conceptual framework was developed using the DPSIR framework.

2.9.1 *The DPSIR Framework*

DPSIR framework links the driving forces such as policy drivers and economic drivers to pressures such as settlements in forests, industrial and domestic activities, agricultural activities and overexploitation of forests. This leads to a state which is degraded forests to the impacts such as loss of biodiversity and responses such as policies. The DPSIR framework stipulates that there is a chain of events where one event leads to the other i.e. Driving forces lead to pressures, which lead to a certain state then the impacts are shown and this elicits certain of responses (Digout, 2005). This framework is used to establish changes in an ecosystem and to identify their effects on society and the environment. In some cases, responses may change pressures and also control the driving forces (Vacik et al 2007).

Driving forces are those factors that involve socioeconomic activities and socio-cultural forces that inform human activities which might increase or mitigate pressures on the environment (Digout, 2005). The social and economic status of local community is known to have significant influence on determining the types of activities they are engaged in, as well as the

impact on different types of interactions toward their natural resources. They can be categorized into governance drivers such as de-gazzettment of forests; policy drivers such as grazing in forest reserves; economic drivers such as poverty, population pressures and reliance on charcoal; technology drivers such as lack of knowledge and use of appropriate technology in tree growing; and cultural drivers such as the cultural urge to own land and traditional land clearance systems such as use of fires (Al-Subaiee 2015).

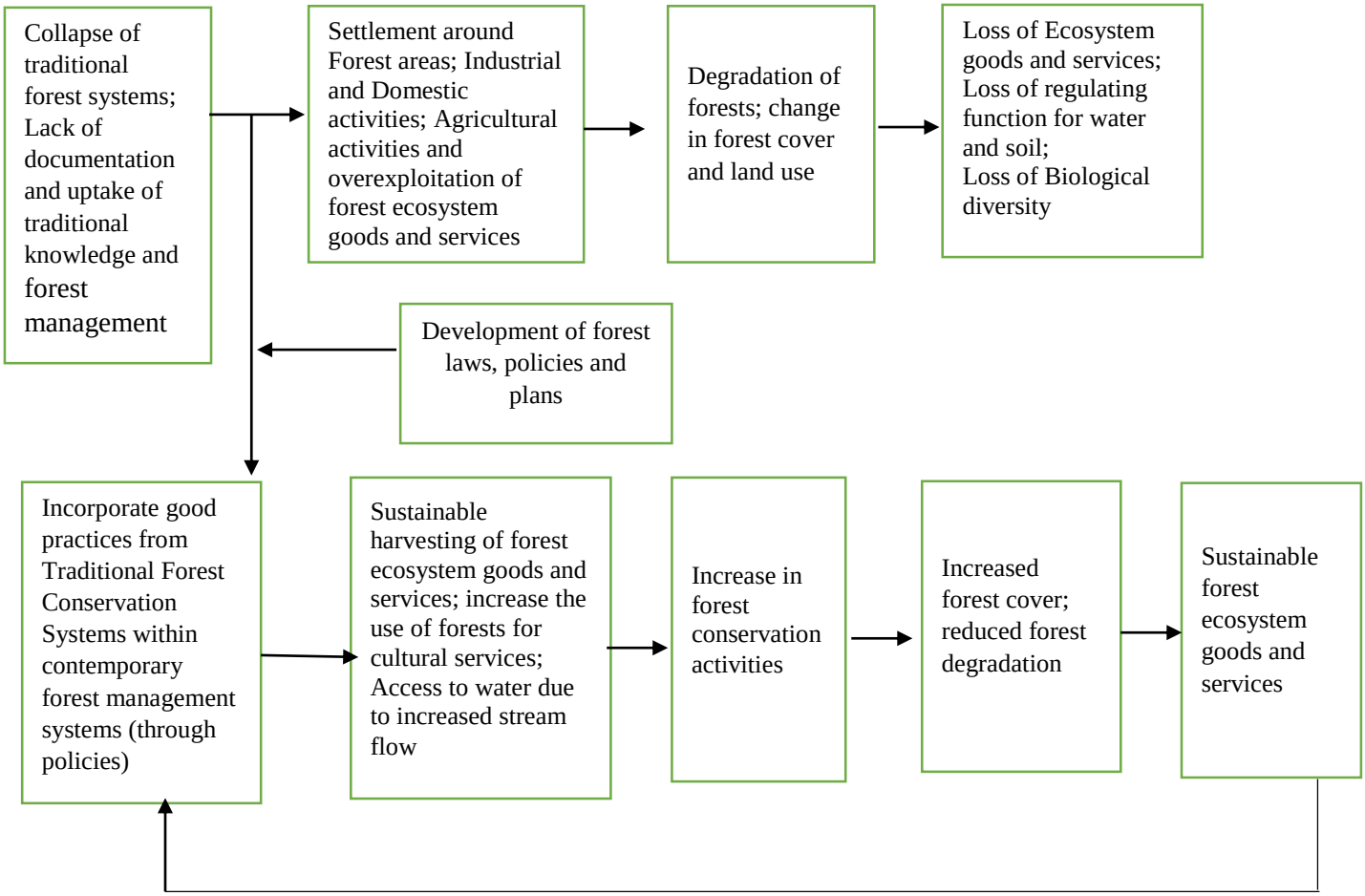
Pressures are defined as those negative effects that human activities place on the environment (Digout, 2005). Currently, there is so much stress on the forests in Kenya; most of the population has settled and is cultivating on forest lands (Wandago, 2002). Pressures stem from illegal logging; charcoal burning; and the encroachment of forests for human settlement and agriculture. Illiteracy, poverty and rapid growth of the human population (Mugo, 2013). Therefore, there is need for the government to support the production and exploitation of non-wood forest products in a sustainable fashion, sustain and build capacity in the formation and functioning of these enterprises (GoK, 2014).

The state is defined as the condition the environment is in at that moment (Digout, 2005). In the case of Kenya's forests, their situation has grown worse over time. In 1963, gazetted forests were approximately three percent of Kenya's total land area. Today, most of them are highly fragmented at less than two percent; they have been excised and encroached on (Mbugua 2009). Impacts are the outcome of human activities on the environment (Digout 2005). For instance, more than 75% of Kenya's renewable surface water originates from the forests; they serve critical water regulating roles that are vital for livelihoods, farming and production of hydroelectric power. Water catchment areas are now severely threatened; nearly 77,270 ha of forest have been lost through excisions and there are still thousands of landless squatters awaiting resettlement on forest land (GoK, 2005).

Responses are those measures that society has taken to address the environmental situation (Digout, 2005). For instance, Kenya's Vision 2030 requires that the country achieves a forest cover of at least 10% to avert climate change, ensure economic growth and employment creation (GoK, 2005). In this regard, the Kenyan government has put strategies in place to rehabilitate forests. Measures such as enrichment planting have been undertaken in degraded sites like galleys and dump sites. Most forests are now under the management of the county governments. Through County Forest Associations, forest adjacent communities, who are key stakeholders in forest management have been able to directly participate in the protection and management of forests. Moreover, the establishment of key institutions such as Kenya Forest

service and drafting of key legal mechanisms have had a positive impact on growth of forests (Wandago, 2002).

Figure 1: Conceptual Framework



Source: Author, 2017

CHAPTER THREE

RESEARCH METHODOLOGY

Introduction

This section will discuss the research methods and study design.

3.1 Research Methods and Study Design

3.1.1 Study Site

The Kipsigis Sacred Hill is located in Londiani Township in Kericho County. The county lies in the late Victoria region; some parts are hilly and has dense vegetation cover. It receives relief rainfall, with temperatures of approximately 17^0C and low evaporation rates. The county covers an area of 2,111 km² (KNBS, 2009); it is divided into six Constituencies, 15 administrative divisions which are further divided into divided into 85 locations which are further sub-divided into 209 sub-locations. It has a population of 752,396 of which most are at the youth; men make up most of the population. Londiani town has a population of 5,437; it is located in Kipkelion East Constituency (CGK, 2013).

The Kipsigis Sacred Hill is found on the South West of Kenya in the highlands, west of the Great Rift Valley (The County Platform, 2016). The sacred Hill forms part of the expansive Mau forest mountain chain and is located at the source of Kipchorian River in the South-West Mau forest bloc. It is covered in thick tropical forests (Tirop, 2013) which harbour a vast array of plants and animal types and also act as a habitat for human beings (Londiani PFM, 2012). It overlooks the Kericho-Nakuru Highway within the Londiani forest (Ngetich 2014). Conservation of the environment forms a crucial part of the Kipsigis way of life. These practices have been able to protect these forests from encroachment and degradation (Tirop 2013).

Figure 2: The map of Kericho County

3.1.2 Data Needs, Types and Sources

This study targeted several different actors within the Kipsigis community. It examined how these actors use their culture to conserve the forests. This study utilised both primary sources of data and also secondary desktop research. Sources of secondary data included published and unpublished government reports, articles, organizational reports and books. Comparative case studies – Loita Forest and Kaya forests- were also derived from secondary data. They assisted in enumerating key issues in traditional forest conservation systems and sustainable forest management.

Additionally, the case studies analysed the role of traditional forest conservation systems in sustainable forest management. Primary data was collected via questionnaires; it investigated how best practices from traditional forest management systems can be integrated into conventional forest management at the county level; examined levels of knowledge on forest conservation and management systems in Londiani; and gathered detailed information about traditional forest management systems in Londiani, with a focus on the Kipsigis Sacred Hill. Both primary and secondary data was triangulated to form a rich analysis.

3.1.3 Sample Size Determination

Londiani Township, which is inhabited by the Kipsigis and other tribes is home to the sacred Kipsigis hill. For a very long time, traditional knowledge has played a key role in the conservation of forests that surround the Kipsigis Sacred Hill. The population of Londiani, an urban region in Kericho County, was estimated at 5,437 people during the 2009 census.

Therefore, the sample size was arrived at using the following formula.

$n = \frac{z^2pq}{d^2}$ Fisher et al (1991)

Where, **n** = sample size,

z = standard normal deviate, which is set at 1.96 and corresponds to 95 % confidence interval.

p = proportion of the population having a particular characteristic for example the portion of households having experienced conflicts (0.9)

q = 1-p, proportion of households without experience of the conflict (0.1)

d = accuracy usually at 0.05

This formula has been used in similar studies by Gakuria (2012) and Margaret (2013)

$$n = \frac{(1.96)^2(0.9)\ (0.1)}{0.05^2}$$

n=138.3

However, the study used a sample of 152 people.152 people represent approximately 2.8% of the entire population that resides in Londiani; this sample size is representative enough.

3.1.4 Sampling Procedure and Data Collection

Primary data was collected using self-administered questionnaires for households and in-depth interviews for key stakeholders and as well as three Focus Group Discussions (FDGs). Respondent households were randomly selected from households that are adjacent to the hill. Sociodemographic data was acquired through use of structured and semi-structured questionnaires. In a bid to boost confidence of data and ensure quality local trained research assistants who are conversant with local languages interviewed the respondents.

Simple random sampling and purposive sampling were key sampling methods in the study. Purposive sampling was successful in acquisition of data from participants at the level of the county and national governments. It was also successful in identifying the council of elders, i.e. persons regarded to be custodians of Kipsigis cultural knowledge. Simple random sampling was successful in identifying respondents when administering the questionnaires at household level.

The Focus Group Discussions contained eight people drawn from the Kalenjin Council of Elders, youth groups and women groups; these were drawn from the respondents that had participated in the household interview. All of these were selected purposively depending on their availability and demonstrable understanding of the Kipsigis culture. Nine representatives from Community Forest Associations, the National Museums of Kenya, and national governmental institutions such as the Kenya Forest Service and the Kenya Forest Research Institute, formed part of the key stakeholder interviews.

3.1.5 Data Analysis

Data was entered into a database Microsoft Excel software 2016 for cleaning and coding and later exported to SPSS version 2013 for analysis. Exploratory data techniques were used at the initial stage of analysis to uncover the structure of data and identify outliers. Descriptive statistics such as proportions and frequencies were used to summarize categorical variables while measures of central tendency for continuous variables. Qualitative data was transcribed verbatim and entered into Nvivo to derive themes. The data was later triangulated with quantitative data.

3.1.6 Ethical Considerations

This hill is one of the Kipsigis sacred sites; the study was carried out with full respect for and in line with the Kipsigis traditions and customs. Consent was sought before interviews were carried out. Once completed, a copy of the findings and recommendations will be made available to the community. Moreover, responses were treated with utmost confidentiality. Respondents were informed on the aims, methods and anticipated benefits of the study; with these known to them, they accepted to participate.

3.2 Study Limitation

First, since most forests in Kenya are located within communities, they have often been left in the hands of the community to manage them. This study was limited to one section of the Mau forest i.e. Forest around the Kipsigis Sacred Hill. Secondly, participation was limited to 152 people that live closest to the forests that surround the Kipsigis Sacred Hill. The population was randomly selected for household surveys and others purposively sampled for the Focus Group Discussions.

Thirdly, there are many strategies and approaches for forest management in Kenya but in this case, only those questions that are related to traditional forest conservation systems were included in the survey instrument. The recommendations of this study are limited only to those forests that are managed by traditional systems. The variables of the study are limited to the analysis of one method of forest management i.e. traditional systems.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

Introduction

In this chapter, results of the research are discussed, analysed and interpreted. This chapter is divided into two sections: the first section presents socio-demographic data of interviewees. The second section discusses the finding of the study that are based on the objectives of the study. The findings are analyzed into tables and qualitative analysis done in prose. The total number of households interviewed was 152 but the number of questionnaires that were returned were 151. This represents a 99% response rate, which is acceptable for a conclusive study. According to Mugenda and Mugenda (2003) a 50% response rate represents a reliable response rate for data analysis.

4.1 Socio-Demographic Data of Participants

4.1.1 Age

Age was categorized in two groups 18-35years- 36 and above years. The 18-35 age group represents the youth; according to the Constitution of Kenya 2010, while the youth are the collectivity of all individuals in the Republic who-- (a) have attained the age of eighteen years; but (b) have not attained the age of thirty-five years (GoK, 2010). The above 36 years age bracket in this case represents the older population.

The mean age (SD) of the participants was 40 years (13.557). While the youngest was 19 years, the oldest was 81 years. Results showed that more than half (58.3%) of the participants were 36 years and above while 41.7% were less than 35 years. Age was an important factor in this study because there was a different outlook on the value of forests and culture in forest management between different age groups. It also sought to assess the levels of knowledge of the Kipsigis Sacred Hill. This is as shown in the Table 1 below:

Variable	**Description**		
Age (n= 151)	**Mean (SD)** 40.13	**Range** 62 (19 - 81)	
		n	**%**
Age grouped	Less than 35 years	63	41.7
	36 years and above	88	58.3

Table 1: Age

4.1.2 Gender and Marital Status

Of those interviewed, 55% were male while 45% were female with a majority of them (68.9%) married as shown in figures 2 and 3 respectively below. This is in line with Kericho County

Government CIDP that states that there are more men than women in Kericho County. According to the 2009 census the total number of male persons in Kericho county was 381,980 while 376,359 were female (CGK, 2013)

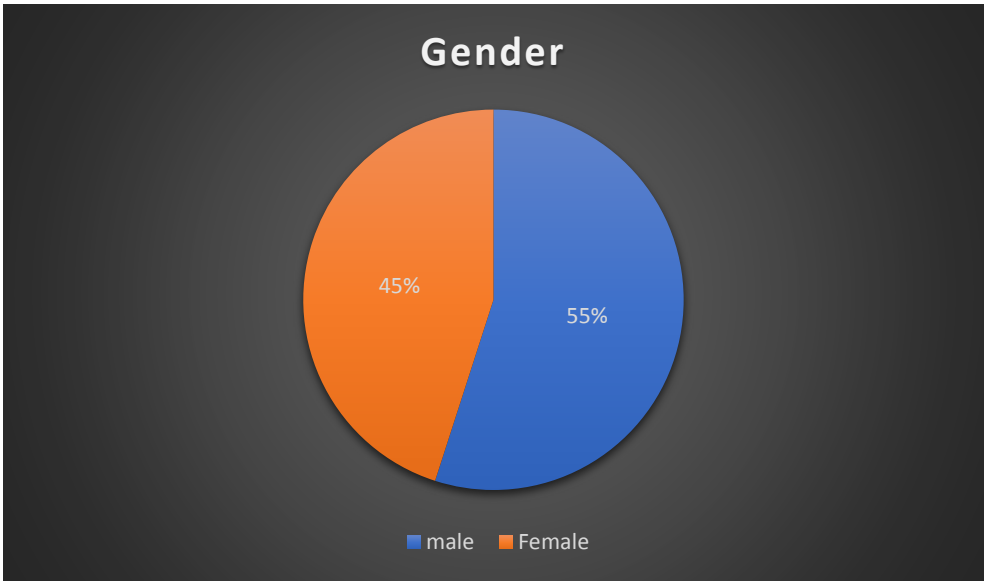


Figure 3: Gender

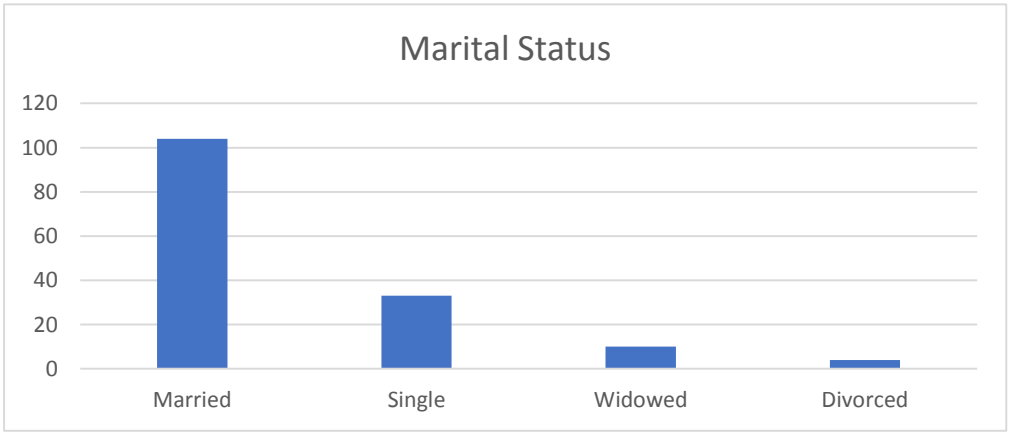


Figure 4: Marital Status

4.1.3 Levels of Education

Most of the respondents (41.1%) reported to have attained secondary school education, 13.6% registered to have no formal education as demonstrated in table 2 . Education levels in Kericho County are low, most of the population do not continue with their education especially after attaining primary school education. Most people have only attained primary and secondary education. According to the Kericho County CIDP, there are very few institutions of higher learning (CGK, 2013). Assessing levels of education was imperative as it sought to analyse the importance of forests to the community from a perspective different from the cultural one.

Variable	Description		
		n	%
Levels of Education	No formal education	21	13.9
	Primary school	59	39.1
	Secondary school	62	41.1
	Tertiary	9	6

Table 2: Levels of Education

4.1.4 Sources of Livelihood

Moreover, while most of the respondents (68.2%) practice farming, others practice business, hunting and gathering. This is illustrated in Figure 4 below: An analysis of the sources of livelihood was significant as it sought to establish the rates of dependency on forest resources.

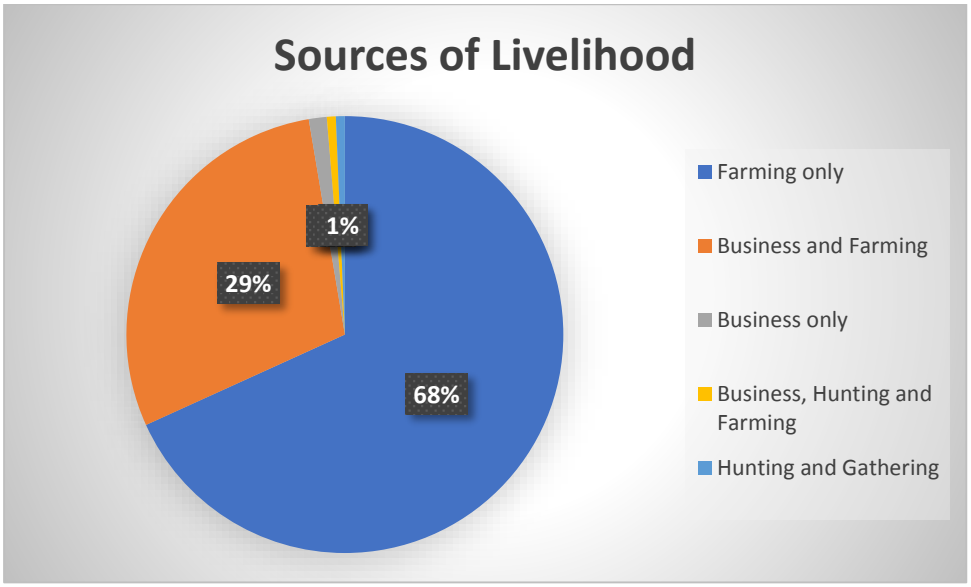


Figure 5: Sources of Livelihood

Kericho has a child rich population aged between 0 to 14 years; this is due to high fertility rates amongst women in the county. In fact, each family has an average of 4-6 children; thereby representing 42% of the total population (KNBS and SIDA, 2013). Despite being the majority in the county, this population does not understand traditional forest conservation systems, this knowledge remains amongst the old population and die with each new generation.

Gender was important in this case because within the Kipsigis culture, cultural knowledge is known to have been passed to male children from one generation to another. This therefore shows that there are low levels of this knowledge amongst women. This may account for the low levels of women participation in the management of the hill but also the increase in degradation of the hill.

The study results on education are in line with the KNBS and SIDA study that shows that 20% of the total population has no formal education; 21% has attained primary school education while 30% has attained secondary education and above (KNBS and SIDA, 2013). The high rates of unemployment amongst those that have attained primary, secondary and post-secondary education has caused this population to look towards illegal logging, unsustainable charcoal burning and felling of trees for firewood as a source of employment. In fact, approximately 84% of the total population of Kericho county depends on firewood while 12% depend on charcoal for their energy needs. Only 1% use liquified Petroleum Gas while 2% utilize paraffin for their energy needs (KNBS and SIDA, 2013). The high rates of unemployment coupled with the high demand for firewood and charcoal explains the loss and degradation of forests in the county.

The study results on sources of livelihood are in line with the Kericho County Integrated Development Plan which states about 80% of the county land is arable and is therefore used for subsistence and commercial farming, and livestock rearing. Most of the land is utilized for tea and flower farming by multinational companies (CGK, 2013). This is supported by the findings of the Kenya Economic Outlook Report of 2017 which stipulates that, agriculture is 'the most important, dominant industry in Kenya as it accounts for 26% of the Gross Domestic Product; 20% of employment; 75% of the labour force and 50% of revenue from exports (GoK 2017). Government policies such as the shamba system and directives such as settlement of the landless people such as the Laibon and the Nubians in forest areas has directly contributed to forest degradation and increased rates of deforestation in Kericho County.

4.2 Knowledge of the Kipsigis Sacred Hill

4.2.1 Knowledge, Perception and Significance of the Hill

The study found that 100% of the participants have some knowledge of the sacred hill. While some of them (30.5%) were born in Londiani and grew up knowing about the sacred hill, majority of them (32.5%) were taught about it through Kipsigis culture stories by their parents. 12.6% read about it from the history of the Kipsigis people while 19.9% just heard about it. 2.6% did not describe how they knew about the sacred hill.

The focus groups observed that according to oral tradition, four men were circumcised at the hill and it was renamed Tulwoop ng'etik- the hill of boys. After the circumcision, the four men went their separate ways and went on to form the Nandi, Kipsigis, Tugen and the Keiyo communities. The four tribes later formed the other tribes of the Kalenjin such as the Pokot,

Sabaot, and Marakwet etc. The hill was later renamed Tulwaap Kipsigis to represent the whole Kalenjin community.

This information is no longer in the public domain; there is scanty information about the Kipsigis sacred Hill with regards traditional forest conservation practices. In fact, the Kericho County CIDP (2013-2017) barely details the importance of the Kipsigis Sacred Hill; it is only mentioned as a cultural site and a tourist attraction (CGK, 2013). This is in line with Mulenkei's argument that traditional systems of knowledge are on the brink of extinction (Mulenkei, 2000).

Out of the 151 interviewees, 99.3% reported that the Kipsigis Sacred Hill was still important to the adjacent communities. This is because it provides various provisioning, regulating, cultural, information and support services to the community. In this case, while 27.2% know the sacred hill as the place where the Kalenjin subtribes separated, 55.6% knew it as a place where Kalenjin performed prayers and ceremonies. Moreover, 1.3% knew it as a place where traditional medicine was acquired while 0.7% knew it as a place where the Kipsigis conducted their rituals as shown in table 3 below:

Variable	Description	n	%
Knowledge on the hill	Yes	151	100
	No	0	0
Sources of knowledge	Resident	46	30.5
	Informed by parents	49	32.5
	History	19	12.6
	Heard about it	30	19.9
	I asked and was told about it	2	1.3
	Told by landowner during purchase of land	1	0.7
Significance of the hill	Yes	150	99.3
	No	1	0.7

Table 3: Knowledge on the Sacred Hill among Participants

4.3 Significance of the Kipsigis sacred Hill Today

The Focus Group Discussions observed that the sacred hill is of significance to the adjacent communities as it is a source of livelihood- the adjacent communities acquire water, firewood, herbs and honey and also graze their livestock in the forest. Interviewees argued that the hill is an important water catchment area. Additionally, in the household interview, the sacred hill was identified as a source of water.

4.3.1 Access to the Hill

Although the sacred Hill is a protected area, (Interview with NMK, 2017), communities that live adjacent to it are allowed to utilize some of the ecosystem goods and services. Ninety-six-point seven percent (96.7%) of the total interviewees reported to visit the Kipsigis Sacred Hill. While 35.1% of the interviewees reported to have visited the hill a few times a month, 23.2% visit the hill several days per day while 0.7% of the interviewee have never visited the hill, they did not give reasons why they have not visited the hill. This is as shown in Table 4 below:

Variable	Description	n	%
Access to the hill	Once per week	28	18.5
	Several days per week	35	23.2
	A few times per month	53	35.1
	A few times per year	27	17.9
	Several times per month	1	0.7
	Never	1	0.7

Table 4: Access to the Hill

4.3.2 Ecosystem Services Accrued from the Hill

Trees from the sacred Hill according to respondents serve numerous purposes; majority reported to use these trees for fuel and building. A few sell them to sustain their livelihoods while a few others use them for electric poles.

Firewood was identified as the most important ecosystem goods accrued from the sacred Hill. This is in line with The Kericho CIDP enlists demand for wood fuel as a key driver of deforestation in Kericho county. Additionally, 80% of Kericho county residents rely on wood fuel while 14.4% rely on charcoal for their energy needs (CGK, 2013). Important non- wood ecosystem goods were identified as honey, fodder, water, fruits and food, herbs, mushroom, seeds, pasture, clay soil and stones. The study found that the most important ecosystem services that these communities acquired were grazing, farming, hunting and worship.

4.4 Status of the Kipsigis Sacred Hill

The Kipsigis Scared Hill has undergone a myriad of changes. This study found that first, the forest has reduced in size. The Focus Group Discussions noted that in the past, there were many trees. However, the people have migrated into the county over a long period of time. Existing land has not been able to absorb these populations, thereby increasing cases of landlessness.

Therefore, in a bid to address the issue of landless, the government has resettled these populations in in forest land, thereby causing forests around the hill to reduce in size. It was

also reported that some indigenous tree species have become extinct but have been replaced by exotic ones. Moreover, indigenous trees continue to be cut down to create room for land for farming and an increasing population. However, despite the loss of indigenous trees, the Focus Group Discussions reported that the shamba system has enabled the community to participate in the conservation of this forest.

Majority (51%) of the respondents reported that deforestation has happened in the Kipsigis Sacred Hill. However, some (3.3%) observed that the sacredness of the hill is not respected anymore so that indigenous forests have been overexploited and degraded as shown in table 5. These findings are in line with Ongugo et al's study that found that area under indigenous forests in Kenya had decreased by 8.1% in 2016 (Ongugo et al 2016). Even then, some (27.8%) still believe that the hill remains a sacred place and is important to the Kipsigis people and those that live adjacent to it.

Secondly, there have also been changes in the community structure and also in forest conservation. Currently, other communities have moved to settle around the hill and also settled in places that were originally inhabited by the Kipsigis. This study found out that they may not have the same values as the Kipsigis when it comes to the importance of forests. Additionally, in the past, community leadership and forest conservation were entirely in the hands of council of elders but now the council of elders has become weak, the forest managed by the Kenya Forest Service.

At the county level, the Kenya Forest Service is charged with the conservation, protection and management of public forests; prepare and implement forest management plans for all public forests; receive and accept licenses and permits; establish and implement benefit sharing agreements; assist in building capacity of forest managers at county level and approve credit facilities and train forest industries that are based at the community level (Article 8. GoK, 2016).

Thirdly, there have been major changes in culture. While cultural practices such as circumcision and rituals were practiced in the forest in the past, they are not practiced anymore. In the past, people gathered at the hill to pray but they do not do so anymore. This, the council of elders felt that they were losing an integral part of their culture and called on county government of Kericho to put measures in place to help preserve their culture.

In terms of forest products, the study found that in the past, people would collect herbs, firewood, wild animals and honey. Today, wild animals such as antelopes, hares and warthogs,

which were reported to be in large numbers, cannot be found in the forest anymore. This, they attributed to degradation of the forests on the hill. Additionally, honey was collected in large amounts in the past but now it can only be found in smaller quantities, there are hardly any honey combs. In fact, residents have to apply for permits from the KFS just so that they can keep bee hives at the hill.

These findings are in line with Collings' study in which he argues that the traditional systems of forest conservation are being eroded. He adds that fewer people in the villages are taking it up; it remains with the older generation. This, he attributes to the inability of policy makers, development planners, and natural resource managers to recognize the importance of traditional knowledge in forest management (Collings, 2009). Ouedraogo et al argue that this knowledge has been suppressed to emphasize more on scientific practices (Ouedraogo et al, 2014).

Variable	**Description**	**n**	**%**
Status of the hill	Deforestation	77	51
	Sacred place	42	27.8
	No change	11	7.3
	Important	8	5.3
	People do not respect it	4	2.6
	Overexploitation of indigenous trees	1	0.7
	Afforestation	1	0.7
	Respected Place	1	0.7
	I don't know	1	0.7

Table 5: The Status of the Kipsigis Sacred Hill

Sacred groves and sites, according to Campbell (2005), are the highest form of protection of forests and forest reserves. Mgumia and Oba (2003) states that they have become sanctuaries for biodiversity in many parts of the world. Therefore, Bhagwat and Rutte (2006) states that in a bid to preserve the site, there is a need to incorporate them into existing Protected Area networks to complement legal protection. Protected Area Networks are Protected Areas that are linked by common focus, similar values and management approaches. They set levels of protection designed to meet objectives that a single protected area cannot meet (WCMC, 2017).

Currently, Kenya does not have Protected Area Networks for forest conservation and management; the existing Protected Areas are 15 national reserves and forests. Each protected area is managed individually and their management is overseen by the National Environmental Secretariat within the Ministry of Environment and Natural Resources (GoK, 2012). However, this is not so in most forests in Kenya. According to Watsa (2014), 91% of Protected Areas

have shrunk in the past 100 years especially by reducing them via legal boundary change and through downgrading i.e. increasing anthropogenic activities in Protected Areas.

4.4.1 Changes in the Kipsigis Sacred Hill

Majority of the interviewees agreed that there have been changes in the use of products with different generations. Most of them felt that past generations utilised forest products much better than they do nowadays feel that their parents have been using the forest products from the sacred hill the same way that the current generations are using them. Respondents reported that forests were given much more importance in the past. They were revered sacred sites so that only the council of elders would access them.

Today, respondents reported that they are allowed to use forest land for farming through the shamba system, which was introduced in the 1990s has increased instances of forest encroachment. The report that it is used less for medicinal purposes and more for charcoal burning and logging. This, respondents argued that it has caused deforestation especially of indigenous forests. Moreover, indigenous tree species have been replaced by exotic ones; this is because unlike indigenous ones, they take a shorter period to mature and this makes business sense for loggers.

The study found out that there have been changes in the management of the Kipsigis Sacred Hill. Unlike in ancient times where forests were managed by traditional means, they are currently under the management of the Kenya Forest Service. Majority of the respondents felt that the Kenya Forest Service played a key role in the management of the forests around the Kipsigis Sacred Hill. A few believed that community Forest Associations played a major role in forest management. Some believe that a combination of efforts from the community, the Community Forest Association and the Kenya forest service has played a key role in forest management.

Despite the current status of the hill, ninety-eight-point seven percent (98.7%) of the respondents believe that the Kipsigis Sacred Hill is still relevant to the communities that live adjacent to the hill. Some believe that future generations will benefit from it, while some believe that if it is conserved, the medicinal herbs and trees will be protected from extinction, while some believe that it should be conserved because it plays a bigger role in combating climate change and prevents global warming.

4.5 Decision Making Processes in the Management of the Kipsigis Sacred Hill

Currently, the Kenya Forest Service is charged with managing Protected Areas. The Kipsigis Sacred Hill has a Protected Area status as it is gazetted as a monument. Community Forest Associations and Chiefs play a key role in decision making in forest management. Moreover, while 59.6% state that the ward has done nothing much to influence decisions about management of forests on the sacred hill, 19.8% believe that it has helped to conserve forests especially through tree planting.

Variable	Description	n	%
Decision makers for managements of forests on Kipsigis hill	Kenya Forest Service	117	77.5
	Community Forest Associations	18	11.9
	Kenya Forest Service and Community Forest Associations	4	2.6
	I don't know	7	4.6
	Chief	1	0.7
	ecosystem conservation	1	0.7

Table 6: Decision Making on Kipsigis Sacred Hill

Article 21 of the Forest Conservation and Management Act, 2016 provides for community participation in management and conservation of forest lands through the County Forest Associations. This study found out that The Kenya Forest Service only engages the community through suggestions and inputs. This has been attributed to the current legal and regulatory framework. Under the constitution of Kenya, the concept of public participation is provided for under Article 1 (2) which states that power belongs to the people of Kenya; Article 10 (2) as a principle of good governance and Part 2 (14) of the Fourth Schedule which states that the county should coordinate and ensure participation of communities in governance.

Seventy one percent (71%) of the interviewees reported that the county and national governments have had positive impacts on forest conservation, 17.9% reported that governments on both levels have had a negative impact on management of forests as shown in the table 9. They have also played a key role in building the capacity of those that live adjacent to the forest on the sustainable use and management of forest products. However, traditional forest conservation systems are missing, yet they play a key role in the management of forests in the county.

A study carried out by Kantai (2000) on Loita forest showed that the Loita council of Elders were so strong that they could make important decisions regarding how and when to use the forest and forest resources. Garcia (2015) also notes that the Maasai have fought against

policies, institutional and anthropocentric drivers to maintain authority over use and ownership of the forest. Sixteen years down the line, a study carried out by Kariuki et al (2016) reveals that there have been increased instances of settlements and logging in Loita forest.

This, just like in the Kipsigis Sacred Hill, is attributed to changes in lifestyles, livelihoods and attitudes towards the use and management of forests and a combination of the lack of strong modern forest management institutions with a declining authority of traditional institutions and leaders. Similarly, the degradation of kaya sacred groves is directly linked to a weak traditional forest management system (Wekesa et al, 2016).

Wekesa et al (2016) note that:

> "even though the political power of the Kaya elders has diminished with the abandonment of the villages, they have maintained a strong ritual and ceremonial role as stewards of the sacred forests and the associated secrets."

This means that Traditional Forest Conservation Systems play a key role in forest management at community level. If they are removed from the management system, there is a likelihood that degradation of forests will continue to occur.

Respondents from the FGDs noted that traditional leaders still have a stake in management of forests at the Kipsigis Sacred Hill but their role is limited to protection of indigenous trees. It was reported that there have been reduced instances of cutting down indigenous trees but there have been increased instances of cutting down exotic trees. In the past, it was reported that communities adjacent to the hill did not cut trees in the forest due to a strong existing TFCS at the time. Nevertheless, this has changed as the forests are now managed by the Kenya Forest Service.

The findings of indicate that changes in forest management from TFCS to the Kenya Forest Service have been detrimental to forests around the sacred hill. The weaker the TFCS get, the more forests continue to be degraded. Government institutions alone cannot be able to reduce the rates of degradation. There is need for government institutions to work with TFCS to enhance sustainability of forests.

4.6 Key drivers of Deforestation

According to the Kericho county CIDP (2013-2017), most forests are found within Londiani Township. These include Tendeno Forest (723.80 ha); Kuresoi Forest (7,366.80ha); Londiani Forest (9,015.50 ha); Malagat Forest Station (3,137 ha); Sorget Forest Station (6,856ha) and

other private forests which are found in tea estates. All of these forests are gazetted yet all of them face the threat of deforestation from various key drivers (CGK, 2013).

Respondents from the Focus Group Discussions noted that there have been high rates of deforestation around the Kipsigis Sacred Hill. This is attributed to population pressure, farming and logging. According to article 33(1), the county government is responsible for the protection and management of forests under its jurisdiction sustainably in accordance to an approved management plan. Article 41 (2) prohibits felling, cutting, damaging and trading in or exporting any protected tree species. According to Article 51 (c) the County Forest Association is charged with protection of sacred groves and protected trees (GoK, 2010).

These findings are similar to those of a study that was carried out by Hosonuma at el (2012) that compared key drivers of forestation in Latin America, Africa and Asia. This study found key drivers in the three continents to be commercial and subsistence agriculture followed by timber extraction and logging, followed by fuelwood collection and charcoal production, uncontrolled fire and livestock grazing.

The study also found that landlessness is also a key issue especially amongst migrants, hence most of them have been resettled in forest land. The Kericho County CIDP notes that landlessness is a key issue. Until 2012, the Laibon and Nubian communities did not have land but have been resettled in forest lands. Respondents from the FDGs also established that populations that live adjacent to the sacred hill also depend on the forests at the sacred hill for their livelihoods (CGK, 2013).

Adongo (2014) argues that as populations increase, there will be need to utilise existing resources to sustain their livelihoods. Overpopulation will definitely lead to overexploitation of these resources for instance forest resources in Londiani. The CIDP notes that there has been an increase in demand for tree and tree products both for fuel needs and the market. Approximately 80% of the population depend on wood fuel for their energy needs while 14.4% depend on charcoal for their fuel needs. Charcoal burning and forest fires are an emerging trend in Kericho County. While charcoal traders have been cutting down trees to produce charcoal, they have also caused big forest fires in the process of burning charcoal, that have destroyed large tracts of forest land. Wood fuel and charcoal have also largely contributed to deforestation and forest degradation (CGK, 2013).

Unemployment was also mentioned as another driver of deforestation and degradation. The Kericho county CIDP notes that the rate of unemployment stands at 47%. At the moment, those

that are 38% are economically inactive. The Focus Group Discussions noted that most of the unemployed youths have resorted to illegal logging and unsustainable charcoal burning to survive. Forest fires and forest degradation are attributed to their activities (CGK, 2013)

In a bid to curb deforestation and forest degradation, FGDs suggested that first, there is need to create awareness on the importance of forests through trainings. Secondly, there is need to enact and enforce laws that protect forests from degradation. There is also need to help identify alternative sources of livelihood for those that illegally log trees or burn charcoal. This can be done by the community- especially unemployed youth- working closely with the KFS to identify alternative sources of livelihood.

4.7 Impact of Devolution on TFCS in Kericho County

The study found out that devolution has had both negative and positive impact on forest conservation. On the one side, devolution has brought up projects/programs that emphasize conservation of exotic trees which mature faster and can be cut down and sold. Secondly, due to food insecurity, forest lands have been seen as alternative for cultivation. Therefore, there is need for counties to collaborate with National government bodies such as Kenya Forest Service; need to create awareness.

Thirdly, local knowledge is being lost; the young generation is not taking it up. Traditions are no longer respected because the youth see no value in them. Fourth, at the moment, indigenous trees are being cut, forests cleared for development of infrastructure.

These findings are in line with Tanui's argument that devolution is slowly contributing to the loss of sacred sites in the county. According to Tanui (2018), the county government plans to improve formal education and so has planned to give away 55 acres of Soin/Sigowet, a land that is sacred to the community, to the Guru Nanak Community for the construction of a university. This land, although semi-arid, has a river, that is of cultural significance to the community. The River is said to have survived droughts over the past centuries and it is also believed that its water can cure skin diseases, deworm cattle and a source of natural salts for their livestock (Tanui, 2018).

On the other hand, the study found out that that both the governments at the national and county levels have played a role in supporting traditional forest conservation systems. At the county level, forested areas with indigenous trees have been set aside for protection. Secondly, the county has allowed people that live adjacent forests to benefit from forest resources and conserve forests through licencing. Thirdly, the development of Community Forest

Associations has ensured that people at the grassroots levels participate in forest conservation. Fourth, the county has set aside funds to conserve indigenous forests. Lastly, the county appoints an environmental enforcement officer who ensures that forests are protected.

At the national level, the government, through the Kenya Forest Service has played a key role in supporting TFCS. KFS rangers have been recruited to manage forests. The study found out that that rangers acknowledges TFCS; works with villagers at community level and incorporates some of the traditional forest management systems to achieve sustainable forests. Additionally, the KFS implements management and conservation of forests and punishes destruction of forests. KFS, together with KEFRI have been training communities adjacent to the forests on how to manage forests. The gazzettment of some forests as Protected Areas has supported TFCS as indigenous forests have been protected in this manner. The enactment of laws and policies and budgetary allocations for forest conservation have also protected forests from destruction.

4.8 Integration of TFCs into Contemporary Forest Management

Sustainable utilization of forests and forest resources is provided for under Sustainable Development Goal 15 which is to "*protect, restore, and promote use of terrestrial ecosystems sustainably, manage forests, combat desertification to halt and reverse land degradation and halt biodiversity loss.*"

The study found that traditional forest conservation systems play a key role in sustainable forest management. SFM and TFCS are directly linked; the objective of TFCS is to attain sustainably managed forests and forest resources. The Kipsigis community has taboos that guide use of forests and forest products. For instance, some taboos forbade cutting of tree species that were used for rituals. These practices have been passed from one generation to another. Furthermore, traditional practices have assisted in conservation of indigenous species that are singled out to have cultural value i.e. medicinal and aesthetic (Ngetich 2014).

By so doing, it enhances protection of endangered species. Forests that have been managed by traditional methods have a lot of cultural significance attached to specific sites of the forest hence protect these sites for their cultural uses. For instance, the Kipsigis Sacred Hill was protected for cultural uses such as for initiation of boys and other rituals. Moreover, under this system, ownership, protection and conservation of these forests are done communally. These systems have reduced conflict over resource use and have ensured effective enforcement of

controls. These practices are favourable towards conservation and sustainable use of forest resources (Ngetich, 2014).

However, the study found that over time, population growth and exotic trees have become key threats to Traditional Forest Conservation Systems (TFCS). Due to population growth, forests- especially indigenous trees- have been cut down to provide land for the increasing population to settle. The loss of indigenous species has made it hard for TFCS to survive. Exotic Trees mature faster than indigenous trees; in this case, they make business sense for saw millers. Therefore, indigenous trees and herbs, which are the core of the culture of the Kipsigis, have been replaced by exotic trees, thereby weakening the existing TFCS.

Additionally, the lack of documentation of good practices in traditional forest conservation has contributed to the collapse of TFCS. Wanza and Njuguna (2012) argue that the lack of documentation of indigenous knowledge on conservation of the Kayas has contributed to the shrinkage of the forest. Similarly, the study found out that due to the high rates of unemployment, the young generation often engages in illegal logging and degradation of forests around the hill. This shows a gap in knowledge of the cultural values, customs and practices as they do not value forests like the older generation do.

Respondents from the FGDs noted the need to document such practices so as to educate the younger generations on the value of conservation of forests. The Forest Conservation and Management Act, 2016 has decentralised forest management. In this Act, customary rights to forests are protected but are limited to cultural activities only. It also permits religious, education and scientific utility with the consent of the Forest Management Board. It is noteworthy that that both attempts at inter-government and national level do not pay attention to the contribution of local practices on natural resource management (Malig and Khadse 2017; GFC, 2017).

Therefore, in a bid to utilize traditional forest Conservation systems to achieve sustainable forests, the Focus Group Discussions noted that there is need to: First, key stakeholders in traditional forest management should be consulted during policy and decision making on forest management. Secondly, opinion leaders need to create awareness on the positive impacts TFCS play in enhancing sustainable forest management since these systems are on the brink of extinction. This can be done by way of setting up joint committees that can devise ways to marge traditional and modern approaches.

Thirdly, key stakeholders in TFCS ought to be involved in forest management trainings so that they can not only create awareness of the importance of TFCS but also build the capacity of forest managers in TFCS. Lastly, contemporary forest conservation systems should be founded on TFCS.

Key stakeholder interviews noted that the Kenya Forest Service has been working with communities to enhance conservation of forests. First through the Kenya Forest Service-Community partnership. The study found out that the Kenya Forest Service often holds meetings with the communities so that they can address the community needs. Secondly, through the KFS-CFA partnership. The study found out that the KFS and CFAs are working together to ensure forest conservation through the promotion of the use of indigenous knowledge. Lastly, the study found out that the CFAs and Forest Conservation committees are playing a major role of linking the community to modern conservation methods.

Respondents from the FGDs noted that the KFS and the CFAs are the key Institutions in management of forests at national and county level. Key stakeholders reported that issues at community level are raised, taken up by CFAs and channelled to the KFS for solutions. After that, the KFS takes up the issues and works hand in hand with local communities to address them through trainings and meetings. At the community level, where TFCS are supposed to be stronger, the study found out that the systems are not supported by some county governments. Moreover, there is lack of respect for these systems; therefore, they have been lost while the remaining ones have become weak.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1.Conclusion

Kenya continues to lose its forests despite developing relevant policies, legal mechanisms and institutions to curb this trend. Traditional Forest conservation systems are known to possess some aspects of sustainable management. They have been successful in sustainably managing different types of forests but there is intra-generational loss of these systems of knowledge.

To achieve this, the study investigated how best governments at national and county level can meet the changing needs of the current and future generations without losing the benefits that traditional Forest Conservation Systems have yielded over time. Specifically, examined the ecosystem services provided by the forest to neighbouring communities; assessed how Kipsigis traditional forest conservation practices have affected provision of these services; and analysed how good practices from traditional forest conservation systems could be integrated into conventional forest conservation systems at county level.

The study found that first, the hill is still important to adjacent communities because they accrued a number of ecosystem services. Provisioning services included food, honey, charcoal, fodder, herbs, water, fruits and electric poles. Regulatory services identified by the respondents were purification of water. The hill is used for cultural practices such as Kipsigis rituals and also as a place of prayer. Secondly, a great deal of decision making and management of this forest and related benefits rests with the national level institutions.

Thirdly, the study noted a growing recognition of the importance of Traditional Forest Conservation systems in forest management in the county as the Kenya Forest Service is working with residents to incorporate this knowledge in the management of the hill. However, its use and contributions remain underutilized. Lastly, good practice analysis showed that the withdrawal of traditional leaders from forest management coincided with changes in forest cover, structure and land use leading to degradation as exemplified in the Kaya and Loita Forests. It was inferred therefore that TFCS are important in sustainable forest management.

5.2 Recommendations

The findings of this study demonstrated that Traditional Forest Conservation Systems are slowly being abandoned by communities in Londiani Township, Kericho County. The systems are being lost with each generation as a result of the changing cultural, social, environmental and economic conditions. This has had a negative impact on the Kipsigis Sacred Hill.

Therefore, there is need for policy and decision makers on matters forests at Kericho County to strengthen these systems as part of the county's policy on forest management. This can be done by constituting a body that will collect, document, validate and monitor good practices in Traditional Forest Conservation Systems. The outcome data can be upscaled to national level and be applied in management of forests in other counties.

The study also recommends that Kericho County mainstream traditional knowledge on forest conservation in the schools' curriculum both at primary and secondary level and even at tertiary institutions as a course in forest management. This can be done by engaging the Kipsigis council of elders to transmit this type of knowledge in formal education. This will promote understanding and appreciation of these systems at an early age, thereby bridging the gap in knowledge between the young and the older populations.

At the national level, the study recommends need for the national and county government to establish Protected Area Networks (PANs) for forests in Kenya. This practice has been successful in coordinating the management of 102 national Parks and 515 wildlife sanctuaries, 47 conservation reserves and 4 community reserves in India (Ministry of Environment, Forestry and climate change, 2017).

5.2.1 Areas for Further Research

The study found that gender plays a key role in Traditional Forest Conservation Systems in the Kipsigis community; forest management is often the preserve of the male gender. Therefore, there is need to further investigate how the female gender can be mainstreamed in forest management in a traditional set up.

This study examined the role of traditional Forest conservation systems in Kipsigis Sacred Hill, which is both a Protected Area and a sacred site. The study did not cover unprotected forest areas. This study therefore recommends the need to examine the role of local knowledge in unprotected forest areas.

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Appendix 1: The Kipsigis Sacred Hill

Source: Author, 2017

Annex 2: Key stakeholders in Forest Conservation and Management in Kenya

Stakeholder	Roles and Responsibilities
Government Institutions	
Ministry of Forestry and Wildlife	Provides policy guidance to both KFS and KWS.
Kenya Forest Service	Formulation of policies on conservation, management, and utilization of all types of forest areas in the country.
National Environment Management Authority (NEMA)	Supervision and coordination of all matters pertaining to the environment.
National Museums of Kenya	Surveys and gazettes and forests and biodiversity of cultural value
Kenya Wildlife Service	Manages forests that are gazetted as National reserves and National parks
Kenya Forest Research Institute (KEFRI)	Carries out user-oriented research for sustainable development of forests and other natural resources.
The Nyayo Tea Zone Development Corporation (NTZDC)	Creates 100-meter tea buffer zone around indigenous forests with a view of protecting these forests threatened by human encroachment. It also protects trees from over exploitation. It also provides alternative sources of livelihood through employment in intensely managed Nyayo Tea and fuelwood plantations
Department for Resource Survey and Remote Sensing (DRSRS)	Collects, stores, analyses and disseminates data on natural resources through aerial surveys, ground surveys, remote sensing, and data management.
Kenya Anti-Corruption Commission (KACC)	Investigates and prevents corruption; advises and educates public institutions on ways to prevent corruption
The Police Department	It has the economic crimes unit that investigates economic crime.

Ministry of lands	Has mandate over land and land use policy issuing KFS with title deeds for forest reserves. Security of land is required to ensure land ownership guarantees
Ministry of Water and Irrigation	Has the mandate for gazettement of water catchment areas
Ministry of Environment and Mineral Resources	General environmental conservation
Training or research Institutions	Education of forestry and conservation
Ministry of Finance	Provision of finances for conservation
Office of the Attorney General	Registration of Community Forest Association
Ministry of Sports and Youth	Promotion of tree planting through the Kazi Kwa Vijana program
Civil Society Organizations, media and community organizations	
Non-Governmental Organizations (NGOs) and the Media	Through NGOs interaction with government and local communities, they are able to influence forest governance.
Community Forest Associations (CFAs) and Water Resource Users Associations (WRUAs)	Communities form CFAs to co-manage forests with KFS. WRUAs are key institutions in management of water catchment areas
Private Companies	
Private companies (telecommunications, tea growers and forest industry players)	These companies either rent space in forests, use trees for processing of tea or are licensed to operate in forestry activities. Most promote good forest governance for security of their long-term investment.
Development Partners	
International Funding and Technical Cooperation Agencies	These agencies are involved in financing forestry programmes in the country. Through their interaction with government, they are able to influence governance.

Source: GoK, 2011

Appendix 3: Study Questionnaires

1. Key Informant Interview Guideline

This questionnaire addresses the policy Question: How can best practices from traditional forest management systems be integrated into conventional forest management at the county level?

In your own opinion, what is the relevance of /or what role do the traditional forest conservation systems -such as traditional rules or laws-play in sustainable forest management? Explain ----------

---

What are some of the policies that you know of that support traditional forest conservation----

---

In your own opinion, do you think devolution has had any impact on forest traditional systems of forest conservation? ----------

---

In your own opinion, how do you think traditional systems of forest management can be integrated into contemporary forest management practices? ----------

---

Do the county and national governments support traditional forest conservation systems?

- Yes
- No

If yes, how they do it?

a. At the County level----------

---

b. At the National level ----------

In your opinion, is there any relationship between traditional systems of forest conservation and sustainable forest management? Explain ----------
---

What mechanisms exist for collaboration and cooperation among the various existing traditional systems of forest conservation and the structures for sustainable forest management? Explain ----------
---

Do the existing institutions reflect the various concerns, interests, dilemmas and values of the local communities where forests are managed by these systems? Explain ----------
---

How have emerging issues such as climate change and development of infrastructure affected traditional forest conservation systems? ----------

---

Thank you

2. Household Questionnaire

This questionnaire assesses the General knowledge on forest conservation and management systems in Londiani.

Background Information

Age ----------

Gender

- Female
- Male

Marital Status

- Single
- Married
- Widowed
- Divorced/ Separated

Highest level of Education

- None
- Primary School
- Secondary School
- Tertiary level

What are the sources of livelihood in Londiani? ----------

Forest Use in Londiani

Do you know of the Kipsigis Sacred Hill?

- Yes
- No

If yes, how did you know about it? ----------

What do you know about the Kipsigis Sacred Hill? ----------

-

Is the hill important to the Londiani community?

- Yes
- No

Do you visit the hill? If yes, how often?

- Once a week
- several days a week
- a few times a month
- a few times a year
- Never

What products does the Londiani community get from the hill?

Do you use trees from this hill?

- Yes
- No

If yes, what do you use them for?

- To build
- For Fuel
- To sell
- Other

Do you collect any other products from the hill? If yes, what do you collect? ----------

---

Do the products you collect today differ from those that you collected a long time ago? If yes, what changed? ----------

---

In your own opinion, what is the status of the hill today? ----------

---

Did your parents use the forest in the same way it is used today? If no, what has changed? --

---

Systems of Forest Management in Londiani

Do you think forest conservation is important?

- Yes
- No

If yes, why? ----------

Who manages forests on the Kipsigis Sacred Hill in particular?

- The community
- The Kenya Forest Service
- Community Forest Associations
- The National Museums of Kenya
- Do not know
- Other

Who influences decisions on forest management? Do you think that your ward has enough influence on decisions about management of forests?

- Yes
- No
- Maybe

Can you explain why? ----------

How do you perceive the role of the county and national governments in forest management?

- Very Negative
- Negative
- Neutral
- Positive
- Very positive

Have you received any training in forest Management? If yes, who trained you? Was it useful? ----------
---

Do you have any additional information that you would like to share with me? Any other information that you would like to add? ----------
---

Thank you

3. *Focus Group Discussions Guideline*

This questionnaire attempts to gather detailed information about traditional forest management systems in Londiani, with a focus on the Kipsigis Sacred Hill.

What do you know about the Kipsigis Sacred Hill? ----------

How significant do you think the Kipsigis Sacred Hill is to residents of Londiani today? ------

---

-Have you noticed any changes concerning the tree cover at the sacred hill over time? ---------

---

-Have you noticed any changes in the species (both Plants and animals)? If so, which species have increased/ decreased over time? ----------

---

----------Do the Kipsigis have a special way of managing the hill?

- Yes

- No

If yes, how do they do it? And is it being done the same way today? ----------
---

If no, did these methods ever exist? And if so, why did they disappear?----------
---

--- ---------- ----------

Have there been any changes in forest use and size, community structure, culture and religion?

- Yes
- No

Did you collect any forest products in the past? Name a few ----------
---

Can you still find the same products in the forest today? ----------
---

Do you think that traditional leaders and traditional systems have influenced decisions made on forest conservation in the county?

- Yes
- No

Explain your answer----------

What challenges do traditional systems of forest management suffer? ----------

---

Does the forest sector in Kericho County experience any challenges? If there are any, name them from the most common to the least common.----------

---

What do you suggest should be done to address these challenges to prevent them from occurring in future? ----------

---

In your own opinion, is there any relationship between traditional systems of forest conservation and sustainable forest management? ----------

---

Have you attended any training on forest management? If so, what organization trained you?

Thank You

Appendix 4: Work Plan

Activity/ Month	**D**	**J**	**F**	**M**		**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Develop Proposal														
Defend Proposal														
Collection of data														
Data Analysis														
Thesis Write-Up & Submission														
Thesis Defense														
Thesis Correction														
Graduation														

Appendix 5: Budget

Budget for conducting research on the Role of Traditional Forest Conservation Systems at the Kipsigis Sacred Hill			
Description	**Unit Cost (Ksh.)**	**Unit Number**	**Total Amount (Ksh.)**
Travels			
Nairobi to project site (Londiani)	15000	4	60,000.00
Accommodation			
Accommodation	7000	4	116,000.00
Breakfast, lunch and dinner	18000	4	72,000.00
Airtime	5000	4	20,000.00
Incidentals	12000	1	12,000.00
Venue rent	5000	2	10,000.00
Refreshment for attendants	15000	1	15,000.00
Per diem &Wage			
Enumerators	20000	3	60,000.00
Interpreter	10,000	1	10,000.00
Total Operating Costs			
Material & Equipment			
Laptop	35,000	2	70,000.00
Pens and Notebooks	10000	1	15,000.00
Grand Total			**460,000**