

**DETERMINANTS OF PARTICIPATORY FOREST MANAGEMENT ON
CONSERVATION OF KARURA FOREST, IN NAIROBI COUNTY, KENYA**

BY

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**A research project report submitted in partial fulfillment of the requirements for the
award of the degree of Master of Arts in project planning and management of the
university of Nairobi**

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DECLARATION

This research project report is my own work and has not been presented for any award in any university.

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This research project report has been submitted for examination with the approval of my university supervisor.

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DEDICATION

To Almighty God for His enduring love, grace and kindness. To my father, the late Maurice Abuto and loving mother Rebeca Apondi, who have inspired me ever since at a tender age. To my brothers Richard Abuto and Pitalis Abuto, as well as my sisters Petronalla Abuto and Prisca Abuto who give me the inspiration to work towards greater achievements.

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ABBREVIATIONS AND ACRONYMS

CBD	Convention on Biological Diversity
CFA	Community Forest Associations
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
EAC	East African Commission
EDPRS	Economic Development and Poverty Reduction Strategy
ENR	Environment and Natural Resources
EU	European Union
EUETS	European Union Emissions Trading System
FAC	Forest Adjacent Communities
FAN	Forest Action Network
FAO	Food and Agricultural Organization
FKF	Friends of Karura
GBM	Green Belt Movement
ITTA	International Tropical Timber Agreement
ITTA	International Tropical Timber Agreement
KFS	Kenya Forest Service
KFWG	Kenya Forest Working Group
MEWNR	Ministry of Water and Natural Resources
MoFW	Ministry of Forestry and Wildlife
NAP	National Action Plan
NAPA	National Plan of Action
NBSAP	National Biodiversity Strategy and Action Plan
NEMA	National Environment Management Authority
NEMC	National Environmental Management Council
NEP	National Environmental Policy
NFPS	National Forest Policy Statement
NGOs	Non-Governmental Organizations
PFM	Participatory Forest Management
RFA	Regional Forest Agreements

UN	United Nations
UNCDD	Convention to Combat Desertification and Drought
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

ABSTRACT

play an important role in supporting livelihood of people and biodiversity. However, the concept of the importance of conserving forests, as well as being part of the initiatives that promote conservation of forests is yet to be understood by some communities and individuals, because of their varied interests in the resource. This has led to more use of the forest resources, than they can be replenished, causing deforestation. Studies have shown that communities that live in close proximity to the forests are the ones who mostly benefit from the natural resource, but are also the ones who are majorly affected by policies and regulations that give more power to the “rich” in the society, in forest resource use access. The purpose of this study was to assess how participatory forest management has influenced conservation of forests, while also looking at some of the factors that determine the engagement and productivity of communities in participating in conservation of forests. The study employed the descriptive survey design. The target population was 875, with 425 being community households, and 450 being forest management staff. The sample size was 269 based on the Krejcie and Morgan procedure, of which 99, were forest management staff respondents, who were selected using the purposive sampling technique, while the remaining 170 were community household respondents, selected through the systematic random sampling technique. The main instrument to be used in the study were questionnaires, whose reliability testing was be done using internal-consistency technique, which was based on the Cronbach Alpha method of analysis. The method of data collection was done through administering of questionnaires to respondents, with both closed and open ended questions, which was then collected back and collated for analysis. The data analysis technique to be used in this study was descriptive statistics, where the data was collated, coded and entered into SPSS system software. Quantitative data was presented using percentages, graphs, and frequency distribution tables, while the qualitative data was be presented in verbatim statements, by quoting the exact responses given by the respondents. Findings from the study revealed that the government was the leading stakeholder involved in participatory forest management of the forest at (63.2%), followed by NGO’s at (43%), while religious (10%) and learning institutions (22%) played the least roles. The study also found that one’s income level does influence the conservation of the forest, i.e, majority of the respondents earn below 10,000, (40%), with their major source of energy being fuel-wood (52.4%), which means that the lower the income levels, the higher the pressure on the forest resources as they are deemed affordable. The study also found out that women are more involved (31.5%) in conservation of the forest compared to men at (15.5%). However, the study also revealed that there are more male leaders (58%) compared to female leaders (43%) in the forest sector, an indication that women are still shy to be in command of forest related activities, as stereotyping also plays and important in the reluctance of women in taking leadership roles in the conservation of the forest. The study also revealed that communities are mostly aware of the rules and regulations that affect them directly such as charcoal rules (60.7%), but have very limited knowledge on other general forest rules and regulations. Based on the findings above, the study recommends more community and stakeholder empowerment towards conservation of the forest. Programmes targeting women and girls from the community as well the management personnel should be encouraged, in order to create confidence on female leadership in forestry. Furthermore, community needs and views need to considered when establishing rules and regulations, so as to ensure that their interests in the stipulated laws. There is need for transparency in stakeholder involvement and equity, in order to avoid conflicts such as power and resource sharing, as well as land grabbing conflicts.

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Forests and natural resources play vital roles in supporting the livelihoods of people worldwide, particularly in meeting the daily subsistence needs of the world's poor. Participatory Forest Management (PFM) can be defined as a forest management approach, which involves forest adjacent communities and other stakeholders in management of forests within a framework, which contributes to community's livelihoods. It is one of the most effective instrument or tool used in sustainable forest management, which positively impedes on conservation status of forests. It is a practice that is characterized by forest-adjacent communities sharing power as well as benefits, and assuming owner and user rights and management of the resources. This contributes to a broader rural development strategy, which aims to improve rural livelihoods and reduce poverty whilst at the same time protecting the environment and promoting gender equality.

The main causes of forest loss are poverty, weak policies and legislations, and lack of empowerment on environmental conservation. These factors in turn lead to deforestation, illegal logging, illegal charcoal burning, and unfavorable terms and conditions on forest resource use. Developing a strategy for community involvement in forest management requires a careful understanding of local conditions, and acknowledgement of the constraints that local conditions impose. Local communities are the main repositories of information about land, trees and other property claims. There are strong grounds for empowering this level rather than surrendering authority and knowledge to outside, mainly written, repositories, which would risk distortions and misrepresentation with no local checks and balances (Brown, 2007).

Participatory Forest Management encourages management of forest and woodland resources by communities living closest to the resources, in conjunction with the offices in charge of the forest resources. The main objective of community participation is to introduce more efficient policies and regulations so as to reduce degradation from natural and forest resource dependants, by

empowering communities to participate in programs whether sponsored nationally or globally, and be able to make their own contributions or inputs, towards forest resource policies and regulations.

For over a hundred years in India forests were under government control with very little peoples' participation (Saxena, 1997). It was only in the late 1980s when the policy makers realized that the strategy of bringing uncultivated lands under government management and using them to produce industrial raw material had neither checked deforestation nor improved the economic condition of millions of people whose livelihoods were dependent on these forests. This led to a fundamental change in the Indian Forest Policy in 1988. Now forests are not to be commercially exploited, but have to conserve soil and environment, and meet the subsistence requirements of the local people. The implementation of the Policy was facilitated by the Government of India issuing a resolution in 1990 making it possible for the Forest Departments to involve people in the management of forests (Mia, 2009) as quoted in (Zaman, 2011). Non-governmental organizations have introduced their group members in social forestry activities and provided them with credit and technical support, which contributes significantly to their self-sufficiency. It has already been proved that when poor people surviving on the forest resources are organized, trained and granted rights, they present an enormous human potential needed for afforestation and forest protection.

The United Kingdom harbors approximately two-thirds of the world's woodland, whose ownership is quite spread and diversified by farmers, local groups, companies, and even family trusts and unions (United Kingdom Forestry Commission, 2011). However, until recently, the United Kingdom did not have the tradition of giving a community the essence of owning or managing its forest resources. In recent years however, the concept of community integration in forest management has become more evident in both rural and urban areas. Community engagement can give local people a sense of ownership and responsibility, and can range from consultation on forestry reports to full community ownership and management. In and around urban areas, the contribution of woodland to urban regeneration and community well-being is increasingly recognized and adopted as an important way of improving post-industrial areas and developing sustainable communities.

Russia federation has been cited as the country with the largest forest cover in history (FAO, 2012). However, over the years, forest coverage has reduced tremendously due to unfavorable and unbalanced forest management policies and management plans, making its adaption to market requirements and relations generally slow. Forest certification has been promoted by specific actors with specific goals. According to the European Commission 2003, most forested land areas are usually privately owned, due to the different interests that actors have on forest resources. Most of the actors that promote the forest certification processes are located predominantly outside Russia, but in their efforts they have also interacted with and reshaped networks, organizational capacities, and social imaginaries inside Russia, even in small forest settlements in resource peripheries (Meidinger, 2012). This shows that networks across local, regional and national borders, as well as across traditionally distinct social sectors played an important role in defining acceptable policy and reshaping community relations in.

In Latin America, highly centralized forestry administrations have achieved limited results in effectively regulating forest resources in almost all countries of the region, mainly due to a lack of funding, scant physical presence in the field, limited access to informal information flows and poorly motivated field personnel (Ferroukhi, 2003). These concerns, however, can be greatly reduced by the early integration of national, state and local governments, as well as community organizations and local non-governmental organizations, into the analysis of the cost and benefits of alternative uses of the forested lands, planning of the additional areas to be protected, the allocation of the funds into different programs, and monitoring and enforcement of the measures designed to protect the forests (Lopez, 1996).

African countries have not been left behind in forest conservation. In 2007, Liberia introduced a community forestry approach that would encourage linkage between the government bodies and the community at large, towards conserving the environment, as well as forests and natural resources (Alden, 2007) as quoted in (Brown, 2007). Community forestry is a promising approach to participatory and decentralized resource management but is quite new in Liberia (Koffa, 2012). This approach to forest management is accepted at the policy level but this does not translate into improved realities, not only because it is new but also because of the fear to let go of over centralized power. Forestry governance reforms that recognize the rights of

communities are a key to the goal of sustainable forest management. The approach supports the reports for community land rights and community empowerment.

In the Democratic Republic of Congo, the community has a bigger say in the control and management of forest and natural resources. They tend to use the traditional way of ownership and management (Counsell, 2006). Rights to cultivate certain parts of the forest may only be granted to individuals by the community as a whole until the forest reaches a certain stage in regeneration, at which point it reverts to the community. Rights to access the forest resources are granted depending on family lineage, as well as the kind of activities that an individual wants to partake in the forest. If it is gathering, the responsible party is usually allocated an area, approximately 2-3 kilometers from surrounding villages. Violent and non-violent conflicts linked to the use of its natural resources have historically prevented the Democratic Republic of Congo from fully utilizing its resources to generate revenue and improve quality of life for its citizens. Democratic Republic of Congo's forests are threatened by plunder and mismanagement: Logging for timber and fuel wood, clearing forests for agriculture, poaching wildlife for bush meat or the endangered species trade, and mining are degrading the forest at the rate of 2 million acres every year (Bennekker, 2012).

Namibia is making strides in community based forest resource management (Ministry of Agriculture, Water and Forestry, Namibia, 2011). The management has consisted of improved technical skills, as well as suitable organizational development, both nationally and within community levels. The rapid increase in the number of community forest reserves has raised expectations on the part of the public as to the economic opportunities associated with their proclamation. It is, therefore, evident that movement towards more community-based forest management in Namibia continues to evolve, with three vast woodlands originally demarcated to become state forests being handed over to local owner-management (Wily n.d), thereby creating more community forests.

Uganda's natural resource base is one of the richest and most diverse in Africa resulting in the country's economy relying heavily on goods and services provided (Ruhanga, 2010). Grassroots authorities and participation of local people makes both responsive and responsible for the bylaws and restrictions that are put in place in the country. However, the policies, rules and

regulations put in place are poorly enforced. For instance, the economic incentive to cut trees or burn charcoal is greater than the incentive to slash and burn land. On top of this, local communities have negative attitudes towards forest management practices because of the strict rules on forest resource utilization. For a long time, local people have had restricted access to extract traditional non-timber forest products and were not given timber felling licences (Obua,1998), hence denying them the benefits of any forest resource business and resulted in mistrust, antagonism and conflicts within the local communities, and the Forest Department.

Tanzania was one of the first countries on the African continent to formally recognize the role of communities in managing and owning forests, and is now considered a leader on the continent with regard to PFM implementation (Blomley, 2009). Tanzania developed a National Environmental Policy in 1997 (Pallangyo, 2007), which provided a platform for making any changes needed to bring environmental considerations into the mainstream of decision making, including construction of frameworks that provide for reforms, institutional and communal arrangements and coordination, thereby providing the legal basis for communities to own and manage forest resources on village lands or jointly manage forest resources within government forest reserves. Consequently, Tanzania now has one of the strongest local institutional frameworks for community-based natural resource management in sub-Saharan Africa.

In Burundi, the government has encouraged public participation by enlisting participation from local communities, private parties and relevant interested stakeholders, in activities that involve forestry and agriculture, such as agroforestry and afforestation, an approach that has stood out in environmental conservation in the country since 1980s (Amsalem, 2002). Engagement of communities in the forest domain gives the people the right to give ideas and opinions on laws and regulations pertained in logging, allocation of permits, and even distribution and allocation of taxes. This approach of integrating community members to law reforms has encouraged an upscale of sustainable forest management in the country.

Since the colonization of Kenya, the forestry sector has been characterized by strong central governmental control (Amrani, 2013). With the implementation of the Forest Act of 2005, the Kenyan government has created an opening for forest-adjacent communities to be recognized as stakeholders in the management of forests. This has given communities the opportunity to

participate in forest management by forming community forest associations (CFAs), thus entering into management collaboration with the semiautonomous state body, the Kenya Forest Service (KFS) (Tapan, 2011). The forest tenure reforms introduced with the Forests Act (2005) embraced the concept of participatory forest management, through the engagement of local communities and the promotion of private investment, enabling private sector and community investment in commercial forestry in gazetted forest reserves, and community-based forest management.

Emerging participatory forest management scenario in the country is a continuum of two extremes. The first is where communities are in joint agreement with the Kenya Forest Service (KFS) in state owned forests with varying degrees of responsibility and decision making. This is a modified form of Joint Forest management (JFM). The second scenario is where communities traditionally own and manage the forests; an approach which is known as Traditional Community Based Forest Management (TCBFM). The benefits and implementation strategies vary from one forest to another. These experiences provide important lessons for successful implementation of PFM in Kenya (Mbuvi, 2009).

Some of the Policies which have been put in place to ensure effective management of natural resources in Kenya include;- National Environment Policy, which aims to provide a holistic framework to guide the management of the environment and natural resources in Kenya, and further ensures that the linkage between the environment and poverty reduction is integrated in all government processes and institutions in order to facilitate and realize sustainable development at all levels; Agricultural Policy, which revolves around increase in productivity and income growth, especially for smallholders; enhanced food security and equity, emphasis on irrigation to introduce stability in agricultural output, commercialization and intensification of production especially among small scale farmers; appropriate and participatory policy formulation and environmental sustainability; Forest Policy Act 2005, which introduced participatory forest management through the engagement of local communities, and the promotion of the private sector investment in gazetted forest reserves, accompanied by institutional and organization change, notably the establishment of the Kenya Forest Service, and the formation of Community Forest Associations (Ministry of Wildlife and Forestry, Kenya, 2005).

1.2 Statement of the Problem

Kenya's forest cover has increased tremendously over the last 10 years, since the implementation of the Forest Act, 2005. Under the Act, the customary rights of the local communities to the forests and defined resources are protected. Despite its pivotal role, forest cover in Kenya has decreased rapidly in the last twenty years due to population pressure and development related activities such as tree poaching, overgrazing, excision, illegal settlement, over harvesting and agricultural expansion. This has reduced the ability of these forests to supply forest products, serve as water catchments, biodiversity conservation reservoirs, wildlife habitat and carbon sinks.

Studies done in Kenya (Wambui, 2002) and (Kipkoeh, 2013), have reported that there is lack of adequate information to communities living around forests and consequently few of them come out to participate in their conservation. Other than the communities living on the fringes of the forest, the general public as well needs information on the benefits of forests, threats, and how to take part in conserving and managing the resource, so that they too can contribute either through donations (funds) or through reporting incidences of forest destruction to the relevant authorities and also take part in planting of more trees in the surroundings where they live. As much as some communities were found to be already participating in management of forests, there are still cases of illegal firewood collection and land grabbing, posing threats to forest resources. Therefore, there is still need to empower many more communities on the threats that their activities pose on forests and the surrounding environment.

Situated on the northern edge of Nairobi, Karura is the largest indigenous natural forest located within the city boundaries. Gazetted in 1932, Karura Forest has come a long way since it began. The management of the forest has constituted both the government and community members in the development of management plans on the usage of the forest's resources. However, there are still cases being reported on illegal firewood collection and land grabbing conflicts, which have put pressure on the forest, thereby threatening its sustainability. On top of this, as much as recreation brings revenue into the forest, it has been reported that too many visitors end up trampling on the forest's resources, leaving behind a trail of destruction on different plant and tree species found in the forest.

Participatory forest management in Kenya still faces several challenges and constraints. These include institutional arrangements that are not well developed and existing ones which were formed without due regard to the law; participation and involvement of stakeholders is low, cost and benefits are not equitably distributed and there are undefined partnership arrangements. In addition, inadequate sensitization and awareness on the requirements of participatory forest management implementation coupled with high stakeholder interests and expectations on benefits of participatory forest management remain a challenge. Policies are yet to adequately recognize and appreciate the various cultural natures that the forest adjacent communities have. Lack of participatory forest management practices encourages poverty, inappropriate farming technologies used by farmers, overpopulation, urban growth and development, poor or inappropriate natural or forest management structures and strategies. Participation empowers community organizations to control the use of natural resources by the local population (Amanor, 2004). The main concerns driving participatory forest management are rooted in neoliberal economic philosophy: the need to make forestry management more efficient and to involve communities in lowering the transaction costs of management.

Amrani (2013), asserts that despite the alluring arguments for democratically decentralized forest management; comprising increased equity, greater efficiency, and enhanced rural development, studies from various African countries (e.g. Mali and Burkina Faso) show that the latest reforms have created neither accountable representative local institutions nor have they devolved power to local levels. Decentralization involves reversing centralized government planning so that planning starts at the local level, instead of being imposed from central authorities. This is a responsibility as well as a right, requiring that communities take a more active role in local government project planning and budgeting processes. As much as participatory methods do not guarantee empowerment, they have the potential to generate downward accountability of the governance process and strengthen civil society.

1.3 Purpose of the Study

The purpose of this study was to assess the determinants of participatory forest management on conservation of Karura Forest, in Nairobi County, Kenya.

1.4 Objectives of the Study

The study was guided by the following objectives:

1. To examine how stakeholder involvement influences conservation of Karura forest.
2. To establish how socio-economic status of the community influences conservation of Karura forest.
3. To assess how gender differences influences conservation of Karura forest.
4. To establish the extent to which level of community awareness influences conservation of Karura forest.

1.5 Research Questions

The study sought to answer the following research questions:

1. How does stakeholder involvement influence conservation of Karura forest?
2. How does socio-economic status of the community influence conservation of Karura forest?
3. How do gender differences influence conservation of Karura forest?
4. To what extent does level of community awareness influence conservation of Karura forest?

1.6 Significance of the Study

The findings of this study are expected to present a better understanding on community interests on forest use, as well as their views on the rules, policies and regulations set for the same. This was in turn help Kenya Forest Service, Kenya Forestry Research Institute, Friends of Karura forest, as well the Karura community, to consider better policy formulation and implementation approaches on forest resource use. The findings are expected to help forest officers, forest departments, and other stakeholders with interests in forest products to prioritize their management plans and projects accordingly, putting in regards, the needs and interests of both the communities and stakeholders.

1.7 Basic Assumptions of the Study

The key assumptions of this study were as follows; that participatory forest management influences or impacts positively on conservation status of forests and vice versa; that officers in Karura offices and community members in Karura would participate and give accurate information; and that the findings of this study would be useful to the forest service in engaging community members and other relevant stakeholders in future programmes, plans and activities.

1.8 Limitations of the Study

The study results were inferred only in Karura Forest, since the responses given only reflected on the ideas of the community members and stakeholders in Karura Forest. There are cases where respondents were expected not to respond to the questions in the questionnaires as expected due to secretiveness, lack of time and confidence. However, in such cases, the researcher ensured no coercion, but encouraged consent from them. Also, the researcher explained to the respondents on what was needed of them in the research, and assured them that there would be none identity of the respondents.

1.9 Delimitations of the Study

This study was strictly confined to Karura forest because of the illegal firewood collection and land grabbing cases that posed a threat to the Forest. Such occurrences are indicators that communities living in Karura Forest are yet to fully understand the consequences of putting such pressures on the forest. Field work studies reported positive feedback and outcome towards participatory forest management in other forest areas such as in Mt. Elgon Forest as well as Marakwet Forest Zones. The study was also delimited to Karura Forest because of its close proximity to the researcher, therefore, cutting back on travel expenses and time wastage for the research work to be done.

1.10 Definition of Significant terms used in the Study

Conservation of forests:	Referred to sustainable use and management of forest resources.
Gender:	Referred to the male and female aspect of individuals.
Level of Community awareness:	Referred to knowledge which community members have on participatory forest management and forest conservation, as well as their rights in use and access to the forest resources.
Participatory Forest Management:	Referred to the involvement of households and institutions in forest conservation.
Socio-economic status:	Referred to one's level of education and income or occupation.
Stakeholder Involvement:	Referred to the participation of forest management staff in conservation of Karura Forest..

1.11 Organization of the Study

This research report was presented in five chapters. Chapter one covered the introduction to the study, which entailed the background of the study, statement of the problem, purpose of the study, objectives of the study, research questions, significance of the study, basic assumptions, limitations of the study, delimitations of the study, definition of significant terms used in the study, and the organization of the study.

Chapter two focused on literature review of the topic, and entailed an introduction, in-depth examination and introduction of the various variables with regards to conservation status of forests. It also included a theoretical framework, conceptual framework, highlights of independent variables, dependent variables, moderating variables, and intervening variables, as well as the summary of the literature review findings.

Chapter three focused on research methodology, which constituted its introduction, research design, target population, sample size and sampling procedures, sampling selection procedure, research instruments, pilot testing of research instruments, validity of instruments, reliability of instruments, data collection procedures, data analysis techniques, and ethical considerations.

Chapter four of this report focused on presentation of findings, analysis and interpretation of data collected. This chapter constituted of its introduction, questionnaire return rate, demographic characteristics of respondents, sexual orientation of respondents, distribution of respondents by age, as well presentation of data based on the variables used.

Finally, chapter five focused on the summary of findings, discussions, conclusions and recommendations of the study. Furthermore, chapter five entailed its introductory part, summary of the findings which was give a summary of each variable with regards to conservation status of forests, recommendations, study contribution to the body of knowledge, and suggestions for further research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter will review literature from previous research work, journals, texts, and reports that are based on the concepts of participatory forest management. It will narrow down to the following thematic areas: Stakeholder involvement in forest conservation; Socio-Economic status of communities and conservation of forests; Gender and conservation of forests; and lastly, level of community awareness and conservation of forests.

2.2 The Concept of Participatory Forest Management and Conservation of Forests

According to MEWNR (2014), “Management of forests in Kenya has laid emphasis on forest sustainability and protection, through command and control system with minimal participation of other stakeholders.” The command and control system in turn, saw the communities being sidelined, from participating in decision making when it came to forest resources, which further led to a rift between forest adjacent communities and forest managers. As a result of differences between communities and forest managers over who had the right to manage and control usage of natural forest resources, there was significant loss of forest cover, unbalanced distribution of benefits, and unsustainable forest resource usage and management. Since the previous legislation and policy had inadequate provisions for community participation in forest management, the government adopted participatory forest management as a strategy to improve management of Kenya’s forests and woodland areas for current and future generations.

However, in developing countries and particularly Africa, forest management policies have in the past failed to recognize the important role that Forest Adjacent Communities (FAC) can play in the management of forest resources. Kenya is yet to recognize efforts and inputs that incorporation of local communities can have on forest resource management. Policies are yet to adequately recognize and appreciate the various cultural natures that the forest adjacent communities have. Community participation towards forest and natural resource mitigation was given a prominent place in the 1992 Rio Earth Summit and the 1994 UN Convention to Combat Desertification. In 1997, community participation was embraced by the United Nations

Intergovernmental Panel, on forest reports for action (Wambui, 2002). This action paved way for establishment of participatory mechanisms, so as to involve all interested parties, including local communities and indigenous people, in policy development and implementation. The main objective of community participation is to introduce more efficient policies and regulations so as to reduce degradation from natural and forest resource dependants, by empowering communities to participate in programs whether sponsored nationally or globally, and be able to make their own contributions or inputs, towards forest resource policies and regulations.

2.3 Stakeholder Involvement and Conservation of Forests

In his study, Barrow, (2002), asserts that, stakeholder engagement is crucial to the success of any certification system. It is only through participation of all interested parties that a system can ensure that; all information and knowledge are applied; experiences and best practices are integrated and; stakeholder expectations are met. While it can be relatively easy to separate State interests from those of communities and rural resource users, the separation of interests within communities is more complex and that complexity varies with the heterogeneity of the community. Different stakeholders within a community may have different interests in the same resource, for instance women seeing a tree as contributing to fodder and firewood to the household, while men say see the same tree as a potential cash earner from the sale of poles. The negotiating and decision making processes are important in themselves, but it is ultimately “who decides” that was determine who has what rights to trees or products thereof.

Governance provides the link between resources and stakeholders responsible for their protection and development of natural resources. Governance includes corruption control, performance in service delivery, the rule of law, public accountability, and regulation (Zweede, 2006).This constitutes a huge challenge for both governments and aid agencies, for governance takes us out of technical and managerial areas that may be strengthened by training and capacity building into the highly complex field of how institutions work or fail to work. Yet facing this challenge is a prerequisite for sustainable resource use and poverty reduction. The alternative is further rapid deforestation, depletion of marine and wildlife stocks and consequent loss of biodiversity.

Participation of stakeholders in decision making and incorporation of their knowledge on forest management reduces the transaction cost of forest management operations. Sharing of inputs,

technological and capital inputs by governments and labor and local information inputs by communities reduce the cost of transactions of factors, thereby encouraging a co-management regime between state and private firms. In Burnely's (2011) study, he highlighted that the main challenges of governance are to provide security for all of its citizens and to build democratic, transparent, and accountable institutions, capable of managing its enormous resource wealth for the benefit of its entire population. Although existing legal frameworks recognize the right to use land laws, it also allows for natural resource degradation, land grabbing, the purchase of occupied land, and the eviction of tenants. Transparency in governance remains another main challenge to effectively manage natural resources.

Confusion between the ownership and the rights for the exploitation and handling of resources and lack of clear guidelines defining the economic relations between the central government, the local government and various economic entities have resulted in the irrational allocation of natural resources and low efficiency in the exploitation and utilization of resources. For example, in a study done in China by Wenfa, (2010), it was found that previously, polluters could often pay less in fines than it cost to install and operate pollution controls; but with review of its environmental rules and regulations, company officials can be detained for as much as 15 days if they haven't done an environmental impact assessment, ignore orders to stop construction, or continue to pollute after being asked to stop, as stipulated in the revised law. This shows that the imposition of strict measures, such as imposition of heavier fines, naming and shaming of companies that do not adhere to stipulated rules and regulations, an also demotion or dismissal of local government officials who manipulate or don't enforce rules and regulations can prove effective to natural resource management.

Kant, (2002), argues that, since many stakeholders with different valuation and preferences for different attributes are involved in co-management, effective communication among different groups is essential to understand each other's perspectives. Similarly, different partners may have their own strengths and weaknesses in terms of administration, technology, and financial resources, and all these resources have to be shared. Existing of trust may lead to reduction of transaction costs associated with all these events – communication, information, sharing of inputs, decision making, implementation, and monitoring.

In Tabbush, (2005) study, it was found that the management objectives for stakeholder engagement need to be reconsidered. If state-owned forests are to realize their potential for the provision of public benefits, publics need to be identified through formal stakeholder analysis (usually involving several local managers) and engagement methods need to be specifically designed to reach each stakeholder group. Therefore, needs of such groups can then be negotiated through deliberative dialogue, as well as encouraging transparency in the groups with giving feedback on what the community members want or do not want.

In a study carried out by Barrow, (2002), it was discovered that in Africa, little real transfer of power has taken place, since government, being the dominant land owner, remains the dominant stakeholder, thereby causing reluctance to truly implement decentralized policies. Despite the trends to promote local community involvement in forest management, African countries are yet to completely adapt to community forest management practices. This is because the nature of interests and stakeholders within communities is highly diverse and dynamic, thereby raising the stakes of private land owners, commercial loggers, fuel wood merchants, as well as the state, while reducing local people's stake in forest resources. A greater understanding of intra-community stakes and interests, together with the institutions that mediate these interests is required, particularly for resources that are important to the poor and marginalized groups.

In Kenya, both governmental and non-governmental organizations have begun taking initiatives in ensuring conservation and management of forests by partaking in activities such as donations, participating in tree planting activities, as well as championing proper use of forest products. However, much emphasis still needs to be done in these institutions towards forest resource management since not every industry or body is geared towards ensuring sustainable forest management, rather, they are driven by their own self-interests even if it means poor management of forest resources. Kagombe, (n.d), concluded that increased democratic space, with stakeholders realizing their rights and responsibilities, as well as holding frequent meetings with relevant forest management institutions, lead to improved forest governance.

Boru, (2014), in his project done in Samburu and Marsabit Counties in Kenya, learnt that community institutions are generally more effective, have community's trust and confidence, hence community members adhere to their set regulation in terms of resources use regulation

than to the government policies. However, it was also found that the existence of stakeholders such as Kenya Forest Service and Kenya Wildlife Service in the same forest ecosystem in Marsabit, confused communities on who is the authority in the management of the forest. Where two or more stakeholders are involved in the management of resources, there should be clear rules and guidelines on how they are supposed to share responsibilities and interests so as to avoid lack of coordination and duplication of effort at the expense of more important things to be done. On top of this, stakeholders should ensure that communities (who are mostly the targets) are involved in their projects at all phases of their projects so as to ensure community ownership and sustainability once the project cycle is completed.

In her research, Wambui, (2002), asserts that, the involvement of stakeholders benefits the well-being of community dwellers since they (stakeholders), have taken interests in educating the community members on the benefits of forest conservation, as well as engaging in income generating activities such as farming, as well as researching for markets that are in need of the community dweller's farm products. This encourages growth of community participation programs and groups, while at the same time sharpening further their (communities and stakeholders) skills, on not only forest conservation measures, but also natural resource management. However, differences also arise among stakeholders based on the individual interests that the stakeholders have or get from engaging in forest conservation. Some of the stakeholders want a bigger share of what donor agencies donate to the communities, while some claim or want special recognition for the efforts made towards forest conservation. Therefore, clear regulations and responsibilities should be outlined wherever stakeholders are involved in management.

2.4 Socio-Economic Status of Communities and Conservation of Forests

The increasing pressures on forests such as development, population growth, conflicts, and limited land resources have led to significant loss of forests. Off-farm employment opportunities, agricultural income, household size, education and incorporation to outside market are found to influence forest dependency. In a study done by FAO, (2006), it was found that rural populations living near forests rely on herbal medicines for their health and dental care. This means that

communities still do depend on forest resources to cater for their daily needs, a factor which if not regulated, encourages forest degradation.

Age has been outlined in studies as a contributing factor to 'who' and 'when' does someone engage in participatory management practices. In a research done in Iran by Faham, (2008), it was found that the level of community participation in reforestation and development of forest areas reduced with the increase in age of the forest dwellers. This means that the earlier the younger individuals are empowerment on forest conservation, the higher the impacts of participatory forest management.

Shifting cultivation remains a major socio-economic problem in many forest areas. This is because forests are usually cleared by fire, mostly for agricultural purposes, and cultivated for shorter periods than they are fallowed. The major impact of shifting cultivation is forest degradation and the conversion of many natural forests into secondary forests. Bohara, (2005), found out that Nepal's agricultural backbone, which provides employment to over 71% of the population, is its heavy dependence on forests and livestock for farm inputs. Preliminary summary results show that 84% of households use firewood for cooking, and 75% collect fodder for livestock from forests. This means that forest products remain essential to everyday life in most Nepalese households, and population growth was continue to increase pressure on forest resources without sustained increase in their supply.

Wollenberg, (2006), study asserts that, the poor are poor mainly because they have no assets such as land, livestock, fish ponds or special skills, whereas the same people have come to associate their source of daily bread with destructive activities in the forests, carried out by unscrupulous companies out to make short term gains. This is an indication that as long as poverty and land tenure systems are not addressed in an economy, especially to the people living adjacent to forest areas, forests and its resources was continue to be threatened as they are used to meet the daily needs of such individuals. Giuseppe, (2009), in their extensive study on rainforests in Cameroon came up with strong convictions based on fundamental principle that, when forests are properly managed, they was sustain national economies, improve the welfare of poorest citizens and protect the environment and biodiversity into the future.

Results in Rwanda, according to a study done by Masozera, (2002), show that in order to curb the socio-economic pressures on forests, conservation programs relating to forest management must consider the socio-economic characteristics of communities around the forest. Therefore, policy measures that aim at increasing agriculture income and generating off-farm employment opportunities for rural communities are needed to reduce forest dependency and enhance biodiversity conservation. Economic incentives are imperative for nature conservation, particularly in remote and ill-monitored regions.

Giliba's, (2011), research concludes that, some of the principal socio-economic factors impacting the quality of forests include; livelihood activities, period of residence in the reserve areas, distance from homestead to the forest, farm land size, household size, education, awareness on management of the forest reserve and awareness on reserve boundaries. Such factors are deeply rooted in the daily needs of communities in terms of forest products that cater for the growing population rather than awareness of forest resources depletion and its consequences. Such socio-economic factors continue to alter or deplete forest covers and affect forest structures and species composition, with population growth being one of the most critical socio-economic factors that could alter the pattern of forest resource use.

The current status of various forest resources, primarily in areas where the government has had minimal control, is as a result of prudent application of accumulated traditional and indigenous knowledge systems. For example, Emerton, (2001), found that in areas where the government has had control, local peoples' knowledge of forest conservation was inadequately considered as an important ingredient in the design and implementation of the interventions. One of the reasons why people carry out economic activities in ways and at levels that degrade forests is because they can gain high economic benefits from doing so. However, there is often little immediate economic gain from conserving forest resources or using them sustainably. This imbalance is particularly acute among forest-adjacent communities in Eastern and Southern Africa, where livelihoods are typically limited and insecure and where forest management regimes have long denied communities legitimate opportunities to use forest resources for their own economic gain.

In the search for adequate subsistence and income, and in the absence of alternatives, people often have little choice but to degrade forests in the course of their economic activities. As long

as this situation holds, and greater economic and financial benefits can be gained from degrading or destroying forest resources than from conserving them, communities have little reason to become involved in sustainable forest management. For instance, in a study done by Gomez 2008, it was discovered that the priorities of community members are largely influenced by what directly affects them most, such as, access to social services, physical infrastructure such as roads, and education for the youth. In such a scenario, forest management and conservation is usually at the bottom of community priorities, owing to the relative abundance of existing natural resources and lack of information, education and communication campaigns on the importance of environmental management and conservation.

Dotzauer, (1993), in his study noted that the underlying causes of deforestation are demographic pressure, lack of access to land resources and a country's macroeconomic policy which concentrates development in urban areas, which are caused by further factors such as poverty, unemployment and a growing social pressure on the remaining existing forest resources. This gives an indication that the forest sector's contribution to the country's GDP is underestimated and forestry is not included in most government's development models which instead put more emphasis on industrial sectors, tourism and agricultural sectors. Overlooking the forest or environment sector in a country's development plan can prove dangerous because most of the economic activities carried out usually affect the environment and natural resources in one way or another.

In a study done by Mena, (2006), it was found that the average annual deforestation rate in the Northern Ecuadorian Amazon was 2.5% and 1.8%/year for 1986-1996 and 1996-2002, respectively, with variables representing demographic factors (i.e., population density) and accessibility factors (i.e. road density), among others, being significantly related to deforestation. At the farm level, the factors related to deforestation were household size, distance by road to main cities, education, and hired labor. The findings of this research demonstrate both the severity of deforestation in the Northern Ecuadorian Amazon and the array of factors affecting deforestation in the tropics. In many of such cases, the government's traditional approaches to conservation, i.e. the command and control, alienates the local communities in particular, from forest management, and therefore, leaving such communities with limited incentives to be rational in the process of forest resource exploitation.

In their study, Mbuvi, *et al.*, (2009), assert that, participatory forest management contributes towards poverty alleviation through Income Generating Activities (IGAs), such as bee keeping and sale of seedlings. Whereas, in areas that do not practice participatory forest management, communities benefit from forests illegally through activities such as poaching timber, poles, and grazing. This means that the people who get affected majorly with the negative impacts on forests are the “poor” communities, who are less empowered, while the ones who continue reaping major benefits due the ignorance of the communities are the “rich” people.

2.5 Gender and Conservation of Forests

The gender of those who actively manage the forest and those who collect the different forest products has important implications for sustainable forest management. Men and women often have different roles in forest management and utilize the forest for different products. For instance, men migrate in greater numbers and for longer periods, while women as heads of the household take the primary responsibility for looking after fields, agro-forests and forests. At the same time, however, women lack access to policy making, extension information, and other forestry services. In their extensive study, Varghese, (2012), discovered that gender issues continue to be of major significance for forest-dependent communities. The outmigration of men to urban centers to earn extra remittances leaves women as heads of the household for much longer periods, while there is still a cultural dependence on absent men to make key economic decisions. This implies that women are still disadvantaged owing to limited access to credit, livelihood extension, and other natural resource use services.

Not only are rural communities facing off with government agencies, business interests, and nongovernmental organizations, but within the communities themselves there are also significant differences in interests, perspectives, and power. It is within rural households and communities that gender differences are most apparent. As development projects have become more concerned with environmental sustainability, conservationists have begun to recognize the need to work for the benefit of local communities. Relationships between genders affect hierarchies of access, use and control of resources, resulting in different needs, perceptions and priorities (Nussbaum, 2001) as quoted in (Torri, 2010). Gender relations are an aspect of broader social relations and, like all social relations, are constituted through the rules, norms and practices by

which resources are allocated, tasks and responsibilities are assigned, value is given and power is mobilized.

In his study, Martin (1995), found out that over half of 800,000 farm families living in communal areas are headed by women. In these areas, women groups manage forest resources and development projects through woodlot ownership, tree planting, nursery development and woodlot management. However, women involvement in the formulation, planning, and execution of policy regarding forestry remains low at all levels, thereby undermining the feminine participation in village institutions. This further means that women's needs and concerns in relation to forest management are often neglected, and they have little power in determining development activities. Forest management projects that consider these needs and concerns have a greater chance of achieving successful environmental and social impact. Men are more interested in commercial forestry. They tend to play a greater role than women in extracting timber for commercial purposes. There's often the misconception that men are the principal, or only, decision-makers with regards to tree planting, management and their use. Women often have greater awareness and knowledge about trees, shrubs and grasses than men, because they devote more time than men to collecting forest produce to meet family needs. However, women are not always given an equal opportunity to apply this knowledge.

Women have a complex relationship with forests and the forestry sector (Meng, 2009). In her research, she discovered that roles were overwhelmingly unbalanced in favor of men in forestry sector decision making. Women in the forestry sector are primarily employed in institutions or administration as researchers or support roles. The so called "professional" women foresters who have first-line management positions seem to be invisible. This shows that although women are significant users of forest products, and they play an important role in forestry activities, they rarely have input into forestry decision making, either at the senior management level or even at the community level. If women are involved in decision making about forests, they could better take account of their needs like access to fuel or fodder, which are otherwise largely ignored by men, and could be more ecologically and socially aware of forest conservation issues.

Too often, women's needs are ignored or are subordinated to those of the men. The contribution of the women could be underestimated thereby reducing the democratic functioning mechanism

of the village institution. A careful consideration of gender equity in the benefit sharing criteria in village institutions is essential to assure the sustainability of women participation in community based conservation initiatives. According to a research done by WWF (2012), it concluded that forest management needs to recognize that forests are important to the poor, especially poor women. This can be attributed to the fact that although women have limited ownership of land, they often use forest resources for subsistence, as safety nets and even to generate modest incomes. Even though both women and men rely on forest products and services, the way they use and manage forests depends on many factors. Women and men have different knowledge of, dependence on, and use of forest goods. They also have different benefits from, access to and control over forests. Women also tend to be more dependent than men on small-scale forest industries for income.

Mwangi, *et al.*, (2009), found that gender does not seem to affect the regularity with which user groups undertook regeneration activities in the forest, even though mixed and male dominated groups had higher reporting of regular regeneration activities. It was also found out that mixed groups tend to do more monitoring than male-dominated ones, while female-dominated ones are unlikely to conduct any monitoring at all. This can be attributed to the fact men have been more empowered than women in forest conservation issues, as they also found out that female-headed households had never been visited by agricultural extension officers, unlike male farmers who got regular visitations.

Poverty is a major factor associated with degradation of forest resources. While such degradation has had an impact on whole communities in general, women have specifically suffered more because of their role as mothers and care givers. The traditional division of labour that places household responsibility on women has also meant that they are almost solely the food providers for their families. According to ACHPR (2014), it was concluded that women are often pushed to depend more on natural resources, since they are the ones often associated with producing food crops, but with no access or control of land, most women are often left to seek alternative means of survival and constitute a very high proportion of the poor. The results of a study done in Kakamega Forest by Guthiga, (2008), show that the gender of the household head had a positive influence on people's perception of involvement in decision-making and conflict resolution in forest conservation. This means that male household heads were more likely to

have positive perception about their involvement in decision-making in forest conservation. This could be explained by cultural setting of the study area where men are more involved in decision-making than women.

Despite an increase in the range of forestry occupations in the late 20th century that includes planning, regulation, as well as the introduction of labor saving devices, the idea of forestry as men's work still prevails. In forestry communities, this image is married to a traditional division of labor where men have rightfully enjoyed forestry jobs and high incomes and have served their families as primary breadwinners, while women have stayed at home to raise children (Varghese, 2012). Men tend to play a greater role than women in extracting timber and non-wood forest products for commercial purposes. Women typically gather forest products for fuel, fencing, food for the family, fodder for livestock and raw materials to produce natural medicines, which help to increase family income.

2.6 Level of Community Awareness and Conservation of Forests

Policy makers frequently disregard environmental issues or assume that the resources are infinite, replenish-able, or replaceable by new technologies. Some feel that the environment should be freely available for exploitation to support the market. Others are simply unaware of the consequences of the incentive systems which they are constructing (Wambui, 2002). Across much of Africa, surging competition over land and resources amongst local, national, and international groups of people is threatening to deprive local rural communities of control over and access to the territories and natural resources upon which their livelihoods depend. Development strategies that reconcile emerging conflicts over land and natural resource use, and which provide local communities with secure rights and tenure, are increasingly critical to rural livelihoods and sustainable development.

In his study, Brown, (2010), stated that, to some extent, local communities have been empowered as a result of the introduction of legislations, which have opened up a recognized space for forest management that was closer to local people. While significant for all forest dwellers, the change in legislation has created a sphere of social recognition particularly for marginalized groups. The prospect of accessing their (local communities) own share of the abundant forestry resources has encouraged them to stay in the village, where their innovative

ideas and their education can contribute to social and economic innovations. While many young people had felt marginalized from access to forest benefits, the principle of community forest management has fostered the potential for social negotiation between older and younger generations, as well as the potential participation of women.

According to projects done by the EEA (2010), it was discovered that community awareness on policies affects the use and management of natural resources. Among the most important are the common agricultural policy, the common fisheries policy, regional development policy, and transport and energy policies. This ensures there is regulation in meeting the needs of the community as a whole, while at the same time sustainably managing the available natural resources. Lack of proper incentives and clearly defined property rights to land, forest and trees can lead to inefficient utilization of natural resources, hence, degrading them.

Community based organizations can play a central role not only in participation but also most importantly in the empowerment of local people as stakeholders and in providing greater incentive to manage and utilize their natural resources in a sustainable way. This is seen by a study done by Dejene, (2003), which shows that one of the major constraints in forest management is operationalizing and translating policies into action at the local community levels, particularly in the areas of natural resources management, due to the lack of strong grassroots or community organizations that are established by local people and serving their interests.

In most cases, the gross domestic product of a country is mainly generated by the exploitation of natural resources, since the whole agricultural sector (cash and food crops, livestock, fisheries and forestry) is based on using or harvesting the natural resources. According to Kamanyire, (2000), the transfer of management of resources from national to local level has encouraged transfer of knowledge on forest resource management from the ‘top-officials’ to the ‘grass-roots’ communities, which has given room to ‘the bottom-up’ management approach, which in most cases has been deemed a very effective management practice.

An example of a forest that has proven successful through participatory forest management is the Duru-Haitemba Forest. For instance, Kajembe, (2003), found a number of factors that have

likely to have contributed to the success of Duru-Haitemba Forest to be; Firstly, each village has clearly defined rules, therefore, securing boundaries; Secondly, village governments have worked out rules that clearly define appropriation and provision, and which have facilitated protection and management of the village forest reserves; Thirdly, there is good collective choice of village forest committees, which are comprised largely of ordinary villagers; Fourthly, locally-instituted conflict resolution mechanisms are respected by villagers; Fifthly, there are clearly defined resource property rights since each village has obtained its title deeds on its forest; Lastly, there is full empowerment, that is, the villagers have the right to devise their own institutions without being challenged by external government authorities. Such example shows that co-operation among managers and community dwellers, promotes and encourages awareness of forest conservation measures.

In a study done in Kenya, Koech, (2009), asserts that, participatory forest management presents a great opportunity in reducing pressure on forests by forest adjacent communities for forest products and services. This is because through community participation comes deeper understanding, involvement, and empowerment on the benefits of natural resource management in adherence to the stipulated rules and regulations. However, communities still need to be sensitized on other sources of livelihood in meeting their needs. There is need to improve communities' education levels. Tertiary training in trading with the forest products also needs to be conducted so as to expand possibilities for the communities in getting income, as well as enabling them participate in the efficient and sustainable use of forest resources. Recognition of opportunities can be futile if no effort is directed by those involved in the implementation of the participatory forestry management process in building on the community's strong points of concern for using the forest resource for livelihood improvement.

There is need for more institutional capacity building by ensuring that formation of community forest associations is better structured and transparent for effectiveness and efficiency. In their study, Kipkoech, *et al.*, (2013), conclude that, that capacity building and governance structure should integrate cooperation from the local community in order to promote success in the management of forest resources in Kenya. Participation of local communities, private stakeholders and even individuals was to create room for successful management of forest

resources, as well as alleviation of poverty, due to mutual benefits gained from the forest resources.

Engaging and teaching community members on forest conservation measures gives them an opportunity to gauge whether the idea forest conservation is fruitful to them. This can be showed by acceptance or denial of the communities to be involved in conservation of natural resources. An example is given in the study carried out by Kobbail, (2012), which showed the respondents' acceptance of community forestry, where 99% preferred that the forests to be owned and managed by them. The majority of the respondents thought that community forestry is the best way to ensure participation, protect forests from damage, and illegal use. This was a very useful result which shows the change in the rural people attitude towards forestry and forest department.

2.7 Theoretical Framework – Tragedy of the Commons by Garret Hardin 1968

This study was be guided by the tragedy of the commons theory. Hardin's piece "The Tragedy of Commons" (Hardin, 1968), symbolizes that degradation of the environment occurs whenever many individuals use a scarce resource in common. He depicts that "commons" is a natural resource that is shared by many individuals, with "sharing" meaning that not each individual has a claim to any part of the resource, but has a right to the use of a of it for his or her own benefit. However, the tragedy is that, in the absence of regulations, each individual was have a tendency to exploit the commons to his` or her own advantage, typically without limit. Under this state of affairs, the commons is depleted and eventually ruined. At the root of the tragedy is the unrestrained self-interest of some individuals. The underlying reasoning is that if the commons is eventually going to be used up, whoever effects the greatest use stands to benefit the most. While the benefits accrue solely to the user, the costs are spread among all others "sharing" the "commons." Most natural resources are held in common, and are shared by many; an example being the air or atmosphere, which is the most essential form of "commons". When it comes to such a common resource, no group or country can claim exclusive ownership of it, however, the excessive pumping of carbon dioxide into the atmosphere by some countries results in the melting of glaciers elsewhere around the planet.

Forest resources are also regarded as “public goods” and hence can be seen as commons because they are meant for all, but not for anyone in particular. This means that they can be used by all people neighboring the forests and even those from far off the forest. The local community (the resource users) would want to maximize benefits from the forest resources such as timber, firewood, poles, and even grass, but would not want to invest in these resources as is illustrated by evasion of permit payments for resource extraction. In an attempt to exploit as much as possible from the forest for oneself, forest degradation results. This degradation is an example of the tragedy of the commons. While the benefits from the use of forest resources are enjoyed by individuals, the forest degradation costs are borne by all users. Biologist Garret Hardin described the conflict between individual self-interests and the good of the community as the “tragedy of the commons”. Each individual uses forest resources at was without caring about the effects on the environment. The community, however, shares the dire consequences of a deteriorating environment. The tragedy is that society at large pays for environmental degradation but there is little or no incentive for individuals to curb their activities unless the government (e.g. Kenya Forest Department, Kenya Wildlife Service) steps in to represent the broader public interest. However, people must be sought for their interests and contributions. If sustainable use of forest resources is to be achieved, there is need for partnership with the local communities in the use and management of these resources. The goal of community participation is to check the “tragedy”. Participation depends on the people’s willingness to co-operate and this in turn depends on how they perceive both their particular interests as rational actors exploiting the resources, and the general interest of sustainable environment (Kiragu, 2002). The commons problem is the social dilemma. Moral commitment to any government’s initiative, environmental protection being the main one in this case, derives from the way the community perceives it. Commitment to participation requires perception that reflects the people's needs and aspirations. The question of needs and aspirations in Mt. Elgon forest adjacent community can be approached by reconciling the tenets of the tragedy of the commons with community development by involving the community in problem identification, planning, resource mobilization, implementation, monitoring and sharing of benefits that accrue from such efforts.

2.8 Conceptual Framework

The diagram below shows the relationship between variables in the study. The variables include influence of stakeholders in forest conservation, influence of socio-economic status of communities on forest conservation, gender differences and conservation of forests, as well as level of community awareness and conservation of forests.

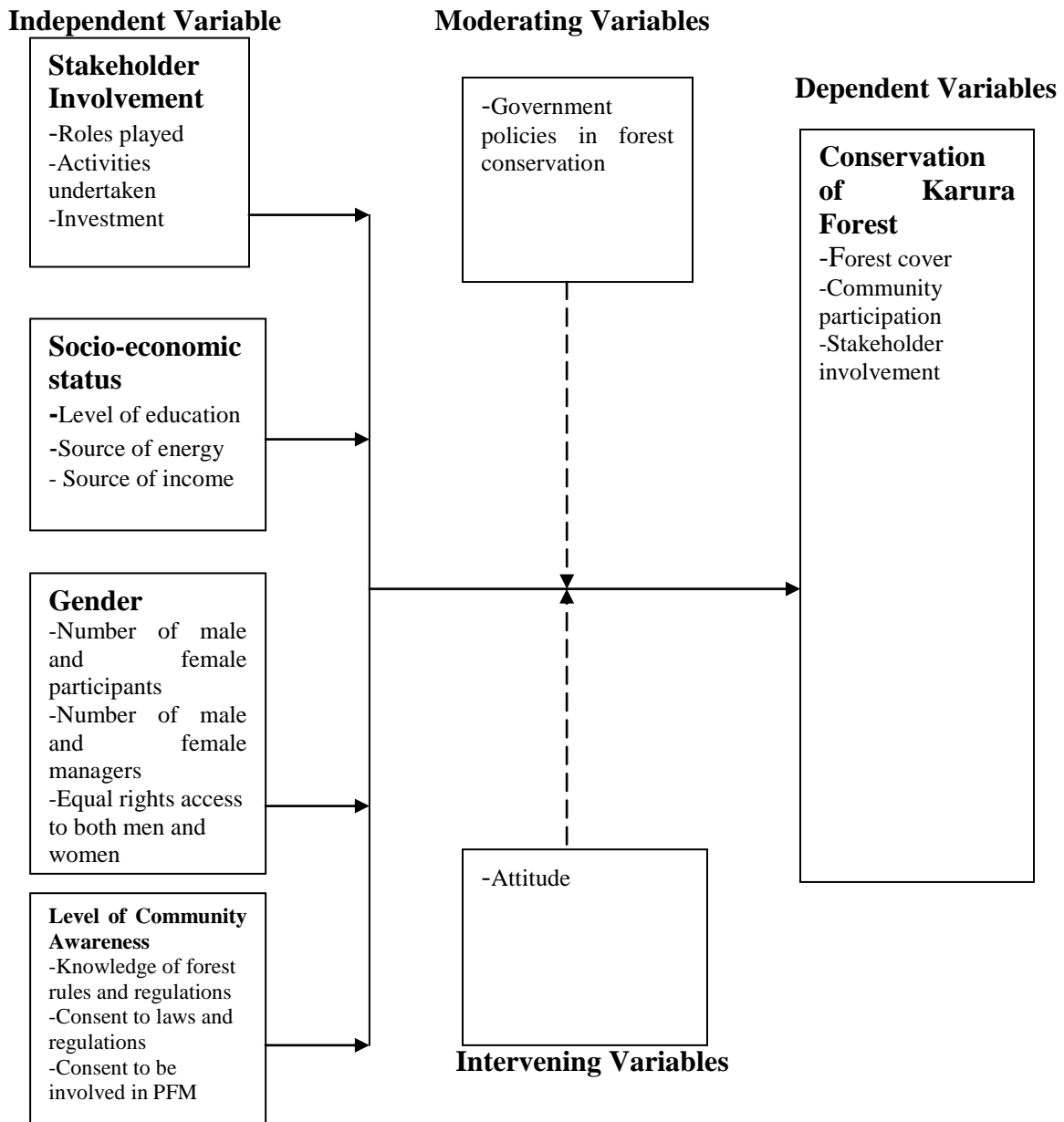


Figure 1: The Conceptual Framework

2.9 Knowledge Gap

High stakeholder interests and expectations on the benefits of participatory forest management remain a challenge in forest resource management. This can be attributed to the fact there are institutional arrangements that are not well developed, while some existing arrangements and frameworks were formed without regards to the perceived laws and regulations. There is still questionable gap on participatory forest management on the extent to which stakeholders are allowed to utilize the forest resources. This is because there have been cases where communities living in or around forest areas have complained that there are ‘favors’ accrued to the ‘rich’, which cannot be given to them (communities). The cost and benefits are not equitably distributed and there are undefined partnership arrangements.

The focus on gender in community forestry is a reflection of the trend in devolution of forest management authority that has been so dominant among many developing countries. A gap remains in establishing the exact manner of governance, including issues of corruption, when more women are involved in decision making. More information is needed on the emergence of mixed groups, and the distribution of responsibility, benefits and information between men and women participants. Research is needed to establish the implications of reforms on women’s rights to trees and forest resources and ultimately on the security of their rights and access, including related outcomes such as livelihoods and forest sustainability.

Research have shown that the rich have are more involved in community forestry while some show that the richer the individuals are, the lesser they are involved in community forestry. There is need for research to be done in order to establish what exactly makes the ‘rich’ or ‘poor’ engage in community forestry. On top of this, the benefits given to the participatory forest management stakeholders, especially the community members are according to what is envisaged by the government bodies. In order for the communities to fully benefit from community forestry, there is still need to deeply understand what their interests are and mainstreaming them into forest policies, instead of offering revenue avenues that the forest management team thinks was be of sustainability to them.

2.10 Summary of Literature

Community based institutions are important instruments in ensuring effective natural resource management. The institutions and stakeholders must operate on transparency, accountability and minimize conflict. Stakeholder involvement with communities in natural resource management enhances sustainability, as well as provides a platform for conflict resolution. However, people must be sought for their interests and contributions. In order to achieve sustainable use of forest resources, there is greater need for -partnership with local communities as well as bodies or institutions that derive their services, interests or products from forest resources in the use and management of these resources (Evans *et al.*, 2008). However, participation depends on one's willingness to co-operate, which in turn is influenced by their perception on their interest, be it particular interests as rational actors exploiting the resources or the general interest of sustainable environment. Therefore, in order for effective sustainable forest resource management to be achieved, a stakeholder's interests should not be overlooked but deeply looked into. Multiple-purpose management of natural resources by communities generally provides more varied land use, with greater species diversity than private/industrial management systems.

When a country faces social, political or economic challenges, it means that there is instability among its citizens, hence difficult to restriction of citizens into forests as they seek alternatives for their shortcomings. With increased development, comes growing population pressure, which in turn leads to limited land resources, and finally resulting to conflicts based on natural resource access. Therefore, in order for the concept of ecological conservation to be fruitful, there is need for integration of ecological, political, social and biological processes in one system (Kipkoech *et al.*, 2013). Forest dependency influences people's attitudes towards conservation programs, hence the need for clear understanding of people's dependency on protected forest resources, and formulate policies that was provide ways of conserving biodiversity, as well as create alternate ventures that was sustain economic growth. Poverty and poor governance are mostly the principle drivers of mismanagement of natural resources, including forests. Kenya can claim significant progress towards success in improved frameworks for forest law enforcement and governance for the management of its forest resources. It has undertaken key institutional, legal and policy reforms to create an enabling environment for participatory forest management; a draft forest policy and a comprehensive Forests Act (2005) that are consistent with the principles

embodied in regional and international agreements and conventions are in place; A Forest Board and a Kenya Forest Service has been established under the act. The challenge now is implementation.

Without proper access to natural resources especially land and water, both men and women was suffer as a result of their dependence on natural resources for their basic needs such as food production. Gender mainstreaming is important when considering policies on aspects such as land rights or ownership, to ensure equalization in access, control and decision making (Kaudia *et al.*, 2007). On top of this, when there is fair and equal distribution of resources and rights, there is bound to be minimum conflict among community members as well as in given institutions over fight for power and control.

There is a need for learning, documentation and sharing of knowledge and experiences on Participatory Forest Management (PFM) in order to capitalize on lessons from partner states. To date, there is comparatively little experience in Kenya with Participatory Forest Management, an approach widely thought to promise effective and cheaper stewardship of the forest resource. Similarly, there is need to have a common understanding on the various concepts and approaches (e.g. the definition of forests, sustainable forest management, integrated natural resource management, participatory forest management, etc.) and a common criteria/standards for monitoring and assessment of compliance with forest laws and regulations, including certification in relation to cross-border trade.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter provides a detailed description of the research design, target population, sample size and sampling procedures, research instruments, pilot testing of the research instruments, validity and reliability of instruments, operational definition of variables, data collection procedures, data analysis techniques and the ethical considerations used in this thesis. The study took place in Karura Forest, which covers an area of 1,063 ha, found in Nairobi County, West-lands Constituency. Karura Forest has been chosen because it is largest of the three forests in Nairobi County, being 1,063 ha, Ngong Forest is 620 hectares and Ooloolua Forest covering 260 ha. It has also been chosen because of its close proximity and easy accessibility to the researcher, which would save on time during the study. Another fact on Karura Forest is that it is easily accessible by road network, a factor that facilitates increased interaction of the local community with the forest ecosystem.

3.2 Research Design

This study was based on descriptive survey design. According to Kothari (2004), such designs are efficient methods of collecting descriptive data regarding the characteristics of populations, current practices and conditions or needs. In this study, descriptive research design was adopted purposely to capture descriptive data from selected samples in Karura Forest. This study considered the correlational type of approach, since it involved interaction with different groups of people, in order to understand the processes, conditions, practices, and structures of the outcome of this study. Correlational research comprises of collecting data to determine whether, and to what extent, a relationship exists between two or more quantifiable variables.

3.3 Target Population

The target population for this study was 875, of which, 425 were community households, and the remaining 450 were forest management staff (KFS, 2014).

3.4 Sampling Size and Sampling Procedures

In order to get the efficient sample size for this study, the researcher applied the Krejcie & Morgan (1970) formula.

3.4.1 Sample Size

Sampling size can be defined as a subset of a population, in that it comprises of some members selected from a population. The sampling size of this research was 269 respondents, from a target population of 875, using the Krejcie and Morgan table (Appendix II).

3.4.2 Sampling Procedure

Sampling procedure can be defined as the steps or methods taken to categorize or choose a sample size. The researcher used the systematic random sampling technique, in selecting respondents forming the community households. In this technique, the researcher first randomly picked a household by selecting the first household that the researcher came into contact with as the first unit, and then was select every 3rd household (nth unit = $N/S = 875/269 = 3$), counting from the 1st unit, when distributing the research instruments to the respondents, until the sample size needed was covered. The researcher also used purposive sampling technique to get the respondents needed from the forest management staff, in order to get specific information needed for the purpose of this study. Using the purposive sampling technique, the researcher selected 99 respondents from the forest management staff, while the remaining 170 were community households selected through the systematic random sampling technique. The results in the Krejcie & Morgan (1970) table can be derived using the following formula;

Formula for determining sample size

$$s = \frac{X^2 NP(1 - P) + d^2(N - 1) + X^2 P(1 - P)}{d^2}$$

s = required sample size.

X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841).

N = the population size.

P = the population proportion (assumed to be .50 since this would provide the maximum sample size).

d = the degree of accuracy expressed as a proportion (.05).

Source: Krejcie & Morgan, 1970

Figure 2: Krejcie & Morgan (1970) Formula for Determining Sample Size

3.5 Research Instruments

The researcher used questionnaires as the main type of research instrument. The questionnaire was divided into four sections, based on the objectives of the study. Section I was on stakeholder involvement and conservation of forests; Section II was on socio-economic status and conservation of forests; Section III was on gender differences and conservation of forests; and Section IV was on the level of community awareness and conservation of forests. The questionnaires were distributed by hands to the 99 respondents selected from the forest management staff, as well as the 170 community households. The questionnaires used consisted of both closed and open ended questions in a standardized form for all respondents. Closed ended questions were based on a likert scale, as well as Yes and No answer formula. The respondents required to tick the preferred opinion for each statement given. Open ended questions were used in order to get qualitative information from the respondents, and were done through quoting verbatim statements in the text, as written by the respondents. This was to assist in supporting the quantitative data, as well as getting to know more views from the different respondents.

3.5.1 Piloting of Research Instruments

In order to determine the efficiency of the research instrument was be used in this study, the researcher carried out a pilot study, which was done prior to the actual process of data collection. According to Mugenda and Mugenda (2003), a sample size of 10% of the sample size is considered adequate for descriptive study. Therefore, 10% of the researcher's population size was 26 respondents, who were picked from Londiani Forest, which had the same characteristics of respondents as the ones used in the actual study. The researcher used different respondents from the ones used in the actual research but with similar characteristics, in order to avoid bias when analyzing data. Once the respondents had filled in the questionnaires, the researcher analyzed the questionnaires and determined from the responses given whether there were any corrections or adjustments to be made in the questionnaires, such spelling mistakes, and unfinished sentences, also, this was to help the researcher in knowing whether the respondents understood the concepts given in the questionnaires. Once the corrections and adjustments were made, the researcher repeated the exercise with same respondents used in the initial testing process after one week. This was to help the researcher to know whether the respondents had

actually understood the concepts in the questionnaires by cross checking the responses given in the second exercise, with the ones which were given in the first exercise, and made necessary changes. The pilot testing was helped in furthering the skills of the researcher before conducting the main research study. Pilot testing the instrument ensures that the questions are understood by the respondents and there are no problems with the wording or measurement.

3.5.2 Validity of Instruments

According to Mugenda and Mugenda (1999), validity is the accuracy and meaningfulness of inferences, which are based on the research results. It is the degree to which results obtained from the analysis of the data actually represent the variables of the study. The researcher looked into the content and construct validity of the research instrument. The researcher assessed the content and construct validity of the research instruments. Content validity showed whether the questions and statements fully represented every element of the research questions and objectives of the study. Construct validity on the other hand ensured that the questions and statements were correctly and clearly stated. To further ensure validity, the researcher shared the details and structure of the research instruments with the supervisor for analysis, for the supervisor to cross-check and affirm that indeed the research instruments capture the full concept of the study. Thereafter, the researcher made the necessary changes needed.

3.5.3 Reliability of Instruments

Reliability is defined as the measure of the degree to which a research instrument yields consistent and coefficient results on data in another given similar situation. Reliability of instrument is done to ensure that there is consistence across all given variables (Mugenda and Mugenda, 1999). Internal consistency reliability was used to measure the instrument's reliability. It evaluates the degree to which different test items that probe the same construct produce similar results.

The internal consistency reliability be carried out using the cronbach alpha test, which not only averages the correlation between every possible combination of split halves, but it allows multi-level responses. The test took into account both the size of the sample and the number of potential responses (Shuttleworth, 2006).

The researcher tested the reliability of the instrument by selecting 10 respondents who were not among those used as respondents in the study, and used the Cronbach Alpha to calculate the reliability of the instrument. The Cronbach test formula is as shown below:

$$\alpha = \frac{Np}{1+p(N-1)}$$

Where N = Total number of items

p = Mean inter item correlation

In this formula; N refers to the number of items being measured and p refers to the mean inter item correlation which is .5. In the questionnaire, the number of items being measured was 5. Therefore, $5(.5) / [1+.5(5-1)]$ gave alpha value of 0.8333. The alpha value ranges between 0 and 1 with reliability increasing with the increase in value. Coefficient of 0.7 is a commonly accepted rule of thumb that indicates acceptable reliability and 0.8 or higher indicates good reliability. Therefore, an alpha value of 0.83333 indicated that the questionnaire was reliable.

3.6 Data Collection Procedures

The researcher collected an introductory letter from the university, as well as a research permit from the Ministry of Science and Technology as required. The letters were issued to the respondents, in order to show valid proof of the research work, as well as gain their confidentiality in taking part in the research. The researcher explained to the respondents the purpose of the research, its content, and concept, as well as what information they were required to provide and how to provide them in the research instrument. After gaining the confidentiality of the respondents, the questionnaires were then administered to the stakeholders and the community households. The questionnaires were distributed on a face to face basis. Once the period given to fill in the questionnaires elapsed, the researcher collected back the questionnaires and collated them for analysis.

3.7 Data Analysis Techniques

This study employed descriptive statistics technique. Descriptive statistics technique is used to present quantitative descriptions in a manageable form by providing simple summaries about the

sample and the measures (Bodgan et al., 1992) as quoted in (Otieno, 2011). Once the researcher assembled the questionnaires, responses to questions were then coded by categorizing both the quantitative and qualitative data, and then entered into an SPSS (Statistical Package for Social Scientists) spreadsheet to facilitate creation of statistics. Quantitative data were then presented in the form of frequency tables and percentages, while qualitative data were presented in verbatim.

3.8 Ethical Considerations

The researcher presented the introductory letters given by the university as well as the Ministry of Ministry of Science and Technology to the respondents as proof of authorization. The researcher sought voluntary consent of the respondents to partake in the research without coercion, so as to avoid any cases of discomfort and misinterpretation of any given data. On top of this, the researcher explained the study benefits to the respondents, and assured them of confidentiality by concealing their identification, and also respected the views, concerns and cultures of the participants. Lastly the researcher communicated the results of the research with Karura Forest staff and community members, to be made available for any respondent that wished to refer to the research work.

3.9 Operational Definition of Variables

Objective	Variable	Indicators	Measurement Scale	Research Instrument	Method of Data Analysis
To examine the influence of stakeholders in conservation of forests	Stakeholder involvement Conservation of forests	Number of stakeholders Type of stakeholders Adoption of PFM	Ratio Nominal Ordinal	Questionnaire	Frequency tables, Mean, Mode, Median Cross tabulation
To establish how socio-economic status of communities influence conservation of forests	Socio-economic status of communities Conservation of forests	Level of education Source of fuel Type of employment	Nominal Nominal Nominal	Questionnaire	Frequency tables, Mean, Mode, Median, Cross tabulation
To assess how gender influences conservation of forests	Gender Conservation of forests	Number of male participants Number of female participants Shared roles in male and female participants	Ratio Ratio Ordinal	Questionnaire	Frequency tables, Mean, Mode, Median Cross tabulation
To establish the extent to which level of community awareness on forest policies, regulations and laws in conservation of forests	Level of community awareness Conservation of forests	Knowledge of forest policies Compliance to law and regulations Willingness to be involved in PFM	Ordinal Ordinal Ordinal	Questionnaire	Frequency tables, Mean, Mode, Median, Cross tabulation

Table 3.1: Operational Definition of Variables

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter presents the data analysis, presentation and interpretation of findings on the data collected from respondents on the determinants of participatory forest management on the conservation of Karura Forest in Nairobi County. The main objective of the study were; to examine how stakeholders involvement determines conservation of Karura Forest, how socio-economic status of the community determines conservation of Karura Forest, how gender differences determines conservation of Karura Forest, and to see how levels of community awareness determines conservation of Karura Forest. Out of the distributed 269 questionnaires, the study sampled two hundred and fifty five (255) respondents within Nairobi County and the data was interpreted as per the research questions.

4.2 Response rate

The study targeted a total of 269 respondents on the determinants of participatory forest management on the conservation of Karura Forest in Nairobi County. Out of the 269 questionnaires issued, 255 were returned giving a 94% response rate as shown in Table 4.1. According to Mugenda and Mugenda (2003) a 50% response rate is adequate, 60% good and above 70% is rated as very good. This implies that based on these assertions; the response rate for this study, 94% is very good. The data was collected from two types of groups; community members made of 168 respondents and employees of the forest management and conservation unit made of 87 respondents.

Table 4.1: Response Rate

Response	Questionnaire administered	Questionnaires filled and returned	Percentage
Total	270	255	94%

4.3 Demographic information

The study found it important to establish the demographic information in order to evaluate the influence of participatory forest management on the conservation of Karura Forest in Nairobi County. The demographic information of the respondents included gender, age, income bracket and level of education.

4.3.1 Gender Distribution

The researcher sought to determine the gender distribution of the respondents and the findings are shown in table 4.2.

Table 4.2: Gender of respondents

Gender	Frequency	Percentage
Male	138	54.1
Female	105	41.2
Missing	12	4.7
Total	255	100.0

The findings of the study indicated that the dominant group, the majority of the respondents who participated in the study, are male and accounted for 54.1% while their female counterparts accounted for 41.2%. Unfortunately 4.7% of the data was not filled hence was considered missing.

This shows that more men are interested and participate in forest management issues compared to women. As Patrick, a forest scout put it, ‘Women are cannot actively participate in issues that do not bring any sources of income, they prefer to carry on with their businesses unless the work or survey will see them getting incentives, only then will they be actively involved in such activities.’ On top of this, this state may have been influenced by conditions whereby the interviewer would get the man and woman of the household, and culturally, the man would often head the talk.

4.3.2 Age Category

The researcher sought to determine the age category under which the respondents fall and the findings are shown in table 4.3.

Table 4.3: Age of respondent

Age	Frequency	Percentage
15- 25 years	49	19.2
26- 36 years	137	53.7
37- 47 years	43	16.9
48- 58 years	19	7.5
Above 59 years	7	2.7
Total	255	100.0

The findings reveal that most participants are in the age bracket of between 26-36 representing 53.7 %, followed by 19.2% who are aged between 15-25 years. The study further reveals that 16.9% of the respondents were aged between 37- 47 years and 7.5% were 48-58 years. 2.7% were above 59 years. It can therefore be observed from the findings of the study that most of respondents who participated in this research are the youth as stated in the constitution, from age 18-35. This could be explained by the literate state of most young people who could read, understand and answer the questionnaires. On top of this, majority of the population where the questionnaires had a higher number of youths, compared to that of men and women with the ages 37 and above.

4.3.3 Level of Education

The study also found it of importance to determine the participants' level of education which is crucial for this study as the respondents' level of education eliminates the bias of uneducated respondents.

Table 4.4: Level of education

Level of Education	Frequency	Percentage
PhD	9	3.5

Masters	10	3.9
Undergraduate	92	36.1
Diploma	89	34.9
Certificate	5	2.0
High school	14	5.5
Primary	27	10.6
None	9	3.5
Total	255	100.0

The results of the findings reveal that most respondents are undergraduates accounting for 36.1% while 34.9% are diploma holders. 10.6% of the respondents were educated up to primary school, high school level were 5.5%, postgraduates were 7.4%, certificate holders were 2% level, and respondents who had not attended school accounted for 3.5%.

The findings of the study show that the respondents had reasonable education to execute the roles assigned to them effectively and efficiently, enabling them make prudent decisions. Another reason for the bracket of education with the highest percentage can also be attributed to the fact that most forest management staff respondents have taken more interest in forest related issues as part of enhancing their careers, thereby giving them the urge to pursue higher standards and degrees in education.

4.3.4 Income earned

The respondents were asked to indicate the range of their income earnings as presented in table 4.5

Table 4.5: Income earned

Income Earnings	Frequency	Percentage
Below 10,000	102	40
11,000 - 21,000	60	23.5
22,000 - 32,000	61	23.9
33,000 - 43,000	21	8.2

44,000 - 54,000	8	3.1
Above 55,000	3	1.2
Total	255	100.0

As shown in table 4.5, the majority of respondents, 40%, fall in the income bracket of 10,000 and below. Meaning that majority of them are low income earners hence would use the forest more to meet their daily needs especially when it comes to usage of fuel wood and charcoal.

This was followed by those earning 22,000-32,000 who made up 23.9% of the respondents and following closely with 23.5% were the ones earning 11,000-22,000. Fewer people earned 33,000-43000 at 8.2% and lesser people at 4.3% in total earned more than 44,000. This shows that the respondents participating in this research are made up of low income earners. This could easily explain why they use fuel-wood as their main source or fuel.

4.4 Stakeholder Involvement and Conservation of Karura Forest

To determine whether the respondents from the community were involved in forest conservation they were asked if they are member of any Forest Community User Group and how long they have worked with that group. The reason for asking this question was to establish the degree to which the respondents are involved in forest conservation and management forums and discussions, which means sharing of more views and information among community members, hence encouraging empowerment, as well as encouraging sharing of available resources.

However, it was found that majority of the respondents do not belong to any group, meaning that sharing of information and empowerment among the community members is still weak, hence, pro-active teamwork towards forest conservation measures is still missing.

Table 4.6: Membership in community user group

Forest Community	Frequency	Percentage
None	16	9.5
Vision	111	66.1
Mushroom	10	6.0
Vision	19	11.3

Umeme	2	1.2
Karume	3	1.8
Karura	1	.6
KFWG	6	3.6
Total	168	100.0

The researcher also sought to know how long the respondents from the communities had stayed in Karura forest and majority (61.9%) of the respondents seemed to have stayed there for more than 13 years. This shows that all respondents were involved in Karura forest and that they were well conversant with the lands and area. The reason for capturing this data was to show the impact and interests that the respondents have on forest conservation, as compared to the duration of their stay, meaning that the longer the duration, the more conversant and interested a respondent is with forest conservation issues.

Table 4.7: Period of residence the community respondents had stayed in Karura

Years	Frequency	Percentage
0-3 years	9	5.4
4-7 years	29	17.3
8-10 years	21	12.5
11-13 years	5	3.0
Over 13 years	104	61.9
Total	168	100.0

The researcher also wanted to know how long the forest management staff had worked in Karura forest station. This was to know if they had stayed long enough to know the procedures and awareness around that area. From the table below, it can be depicted that majority of the staff members has been in the specific station for 0-3years, meaning that most of them were new to the area. The rest, a total of 44.7% were well conversant with the area and the communities surrounding them having stayed there for more than 4 years, with 1.1% having been there for the longest time of above 16 years.

Table 4.8: Period of residence the forest staff had worked in Karura Forest

Years	Frequency	Percentage
0-3 years	49	56.3
4-7 years	23	26.4
8-11 years	12	13.8
12-15 years	2	2.3
(5) Above 16 years	1	1.1
Total	87	100.0

Economic incentives and especially adequate conservation tools scored badly with only 34.5% and 26.4% respondents respectively believing that it happens mostly. But majority voted for rarely does it happen and sometimes it does not happen at all as the table below indicates.

Table 4.9: Rating of incentives and empowerment by Forest staff responses on benefits received by participating in PFM in Karura Forest

Benefits	Rarely	%	Not at all	%	Mostly	%
Employment opportunity	18	20.7	17	19.5	52	59.8
Access to forest resources	17	19.5	17	19.5	53	60.9
Learning/research	33	37.9	19	21.8	35	40.2
Economic incentives	28	32.2	29	33.3	30	34.5
Technical assistance	28	32.2	36	41.4	23	26.4
Cash money	25	28.7	50	57.5	12	13.8

4.4.1 Role played by different stakeholders

The researcher wanted to evaluate who plays what role when it comes to forest conservation and at what level. This was so that it may establish the leading group and see what incentives can be given to the best and least leading group so that they may be vigilant in conservation of Karura forest and get what to recommend to better these efforts. The results were displayed in the table below according to the community's opinion. From the data collected from the community

respondents, it is clear that women were the people who played a very big role when it came to forest conservation with 30.4% followed by the men at 26.2%, religious institutions came closely at 22% and learning institutions playing some role at 10.7%.

Table 4.10: Roles played by different stakeholders according to the community respondents

Key: VSR=Very Small Role, SR=Small Role, RR=No Role, BR=Big Role, VBR=Very Big Role

Stakeholder	VSR	%	SR	%	NR	%	BR	%	VBR	%
Men	15	8.9	18	10.7	9	5.4	82	48.8	44	26.2
Women	3	1.8	17	10.1	12	7.1	85	50.6	51	30.4
Religious Institutions	11	6.5	35	20.8	42	25	43	25.6	37	22
Learning Institutions	15	8.9	60	35.7	37	22	38	22.6	18	10.7
NGOs	97	57.7	32	19	21	12.5	16	9.5	2	1.2
Government	69	41.1	63	37.5	21	12.5	10	6	5	3

According to the communities surrounding Karura forest, the government and the NGOs played very minimal roles with 3% and 1.2% respectively. 97% believed that the NGOs were playing a very small role in Karura Forest conservation while 69% of the respondents believed that the government played a very small role. As the table shows, 25% of the respondents seemed to believe that the religious institutions played no role with learning institutions following suit at 22%.

Table 4.11: Roles played by stakeholders according to the forest staff management

Key: VSR=Very Small Role, SR=Small Role, RR=No Role, BR=Big Role, VBR=Very Big Role

Stakeholders	VBR	%	BR	%	NR	%	SR	%	VSR	%
Civil Society Organizations e.g GBM,FAN	45	51.7	31	35.6	3	3.4	4	4.6	4	4.6
Government	55	63.2	22	25.3	5	5.7	4	4.6	1	1.1
Professional Associations e.g Kenya Forestry Society	37	42.5	36	41.4	6	6.9	8	9.2	0	0
NGOs	26	29.9	43	49.4	11	12.6	5	5.7	2	2.3
Community Based Associations	30	34.5	36	41.4	6	6.9	9	10.3	6	6.9

Religious Institutions	6	6.9	24	27.6	15	17.2	31	35.6	11	12.6
Learning Institutions	13	14.9	24	27.6	4	4.6	25	28.7	21	24.1

From the table above, it is clear that the government plays a leading role 63.2% unlike what the communities' respondents thought, then NGO at 43% followed closely by Kenya forestry society at 42.5%.. The staff members and community respondents seem to agree that the religious and learning institutions are playing a very small role when it comes to the conservation of the forest.

4.4.2 Activities affecting conservation of Karura Forest

The researcher went out to find out what were the activities surrounding Karura forest and how they impacted the efforts of all stakeholders in conserving the forest cover and whether they did it positively or negatively. Illegal firewood collection had a 74.7% negative impact on Karura forest, land grabbing followed suit with a total of 60% negative impact, inadequate forest management skills was also observed to be too high at 59.7%. Invasive species were thought to affect the forest by 49.7% negatively, thereby suppressing the possible positive impacts from forest conservation activities such as new trees planted in the area. The invasive species led to the drying up of several tree species. Recreational activities seemed to be the one leading on the positive impact with a total of 56.3%. Staff residential houses and investment in forest resource conservation also seemed to be negatively affecting the forest cover. This is because the residential houses ate up a percentage of the said forest, while minimal investment also led to minimal measures towards forest conservation and management efforts.

Table 4.12: Level at which the following activities affect Karura forest conservation

Key: HNI=High Negative Impact, LNI=Low Negative Impact, N=Neutral, LPI=Low Positive Impact, HPI=High Positive Impact

Activity	HNI	%	LNI	%	N	%	LPI	%	HPI	%
Illegal Firewood collection	27	31	38	43.7	12	13.8	3	3.4	7	8
Invasive species	21	24.1	25	28.7	29	33.3	4	4.6	8	9.2
Land grabbing	31	35.6	29	33.3	15	17.2	3	3.4	9	10.3

Recreational activities	12	13.8	20	23	6	6.9	10	11.5	39	44.8
Inadequate forest management skills	19	21.8	33	37.9	12	13.8	16	18.4	7	8
Staff residential houses	15	17.2	19	21.8	30	34.5	10	11.5	13	14.9
Investment in forest resource conservation	10	11.5	7	8	23	36.4	34	39.1	13	14.9

The research discovered that activities affecting participatory forest management negatively were many and a few had a positive impact. As one officer put it, ‘Inadequate forest management skills have led to degradation of the forest. This is because at times you find officers uprooting trees they think are of a negative impact to other tree species, yet in actual sense they do not pose any harm to other trees. These are scenarios that could be avoided if the officers were actually well conversant with impacts of different available tree species.’

4.5 Socio-Economic Status Communities and Conservation of Karura Forest

The research sought to establish the socio-economic status of the community to see how it affects the conservation of Karura Forest and one of the questions answered was the source of energy for most members of the community. This could also be explained by the income levels the respondents said they get. The table below represents their responses.

Table 4.13: Main source of energy

Source of energy	Frequency	Percentage
Charcoal	24	14.3
Gas	25	14.9
wood fuel	88	52.4
Electricity	29	17.3
Bio-gas	1	.6
Other	1	.6
Total	168	100.0

From the table above, majority of the community members (52.2%) use wood as their source of fuel. This is more than 50% of the respondents who mainly use wood as their source of energy which they get from the forest. Some of the respondents, 17.3% said they use electricity as their source of energy, charcoal and gas almost took the same preference at 14.3% and 14.9% respectively. 0.6% used biogas making them the minority. Charcoal comes from wood burnt and the wood is gotten from the forest hence they make a total of 66.7% of the members using wood when combined with firewood. This shows a high rate of consumption of trees for fuel from the forest and a negative impact to conservation of Karura Forest.

The forest staff was also asked to rate how some activities impacted Karura Forest and their answers were represented in the table below. According to them, the major activity affecting forest conservation negatively was inadequate technology at 55.1%, followed by low levels of education among the people supposed to conserve the forest. Lack of incentives also took 50.5% on the negative scale. Compared to charcoal, timber and wood fuel which had 33.3% for the two and 27.7% respectively, were affecting the forest negatively at a lower rate than the ones mentioned above.

Table 4.14: Rating by Forest Staff on Activities affecting the conservation of Karura Forest
Key: HNI=High Negative Impact, LNI=Low Negative Impact, N=Neutral, LPI=Low Positive Impact, HPI=High Positive Impact

Activities	HNI	%	LNI	%	N	%	LPI	%	HPI	%
Charcoal use	18	20.7	11	12.6	29	33.3	20	23	9	10.3
Timber use	16	18.4	13	14.9	25	28.7	22	25.3	11	12.6
Fuel-wood use	11	12.6	13	14.9	29	33.3	23	26.4	11	12.6
Bio-gas use	14	16.1	7	8	34	39.1	21	24.1	11	12.6
Recreational activities	15	17.2	5	5.7	18	20.7	7	8	41	47.1
Inadequate management skills	11	12.6	24	27.6	37	42.5	11	12.6	4	4.6
High education level	14	16.1	12	13.8	30	34.5	19	21.3	12	13.8
Low education level	18	20.7	26	29.9	34	39.1	3	3.4	6	6.9
Inadequate Technology	25	28.7	23	26.4	27	31.0	6	6.9	6	6.9
Distance of households and	6	6.9	27	31.0	30	34.5	16	18.4	8	9.2

institutions from the forest										
Family size	6	6.9	27	31.0	30	34.5	16	18.4	8	9.2
Training and awareness	3	3.4	8	9.2	31	35.6	25	28.7	20	23.0
Benefits derived from the forest	14	16.1	10	11.5	15	17.2	10	11.5	38	43.7
Lack of forestry incentives	33	37.9	11	12.6	21	24.1	14	16.1	8	9.2

The research asked the community what kind of benefit they derive from the forest in terms of products and/or services. This was to gauge what the community deemed important from the forest and see how it affected the conservation of Karura. 48.2% said they get fuel from the forest combined with the 9.5% of charcoal. It seemed that more than half of the respondents got fuel from the forest in terms of firewood or charcoal. Some said they get jobs, such as the 23.8%, who have been employed as forest scouts, while others take care of tree seedlings. On top of this, they are involved in several ventures such as bee keeping, which has acted as a reliable source of income for them. 7% and 6% of the respondents said they get timber and recreational services from the forest respectively. 4.8% said they get nothing from the forest in terms of services or products. This shows that the community uses the forest as their source of livelihood and if they are well trained in taking care of it, they would gladly do it so that they may keep the forest alive and better so that it may serve them and take care of them and their families in the future.

Table 4.15 Major product/service obtained from the forest

Product/Service	Frequency	Percent
Charcoal	16	9.5
Fuel wood	81	48.2
Timber	13	7.7
Recreational	10	6.0
Job	40	23.8
None	8	4.8
Total	168	100.0

4.6 Gender Differences and Conservation of Karura Forest

The research wanted to know which gender was more involved in conserving the forest and how they did it so that it may establish which gender can be given incentive and what kind of activities can be done to help improve the responsibility of taking care of the forest cover. The results were as tabled below.

Table 4.16: Gender Differences and Conservation of Forests

Key: SA=Strongly Agree, A=Agree, N=Neutral, D=Disagree, SD=Strongly Disagree

Statement	SA	%	A	%	N	%	D	%	SD	%
Men are more involved in conservation of forests compared to women	30	17.9	26	15.5	50	29.8	41	24.4	21	12.5
Women are more involved in conservation of forests compared to men	31	18.5	53	31.5	53	31.5	14	8.3	17	10.1
Female leadership in forest conservation reduces conservation of forests compared to male leadership	12	7.1	24	14.3	61	36.3	56	33.3	15	8.9
Male leadership increases conservation of forests compared to women leadership	9	5.4	58	34.5	60	35.7	24	14.3	17	10.1
There are equal rights and opportunities to both men and women in forest resource use conservation of forests	31	18.5	43	25.6	55	32.7	26	15.5	13	7.7
Women are afraid in participating in conservation of Karura forest	14	8.3	20	11.9	40	23.8	34	20.2	60	35.7
Men are afraid in participating in conservation of Karura forest	10	6.0	16	9.5	53	31.5	39	23.2	50	29.8

From the table above, it is clear that 50% of the respondents agree that women are more involved in conserving the forest than the men, with only 33.4%. When asked under which gender's leadership was the conservation of the forest improved, 42.2% disagreed that female leadership helped improve conservation, while only 24.4% disagreed that male leadership helped improve the forest cover. When asked if there are equal opportunities for both men and women in conserving Karura Forest, 44.1% agreed, 32.7 were neutral while 23.2% of the respondents disagreed. This shows that the majority agreed that there were equal rights for both genders to conserve the forest. When asked between men and women who were more afraid in participating in the forest conservation, more than half (55.9% for women, 53% for men) of the respondents disagreed that either gender was afraid of conserving the forest showing that given the chance, the respondents are willing and able to conserve Karura forest.

The researcher wanted to reveal to what extent the women and girls are affected by age, religion, stereotyping, culture, training and awareness and incentives when it came to conservation of Karura Forest. The results are as displayed in table 4.18. From the data, age, religion and culture did not affect the female population from conserving the forest as each had a no extent of more than 50% from the respondents. However, stereotyping had a 56% extent affecting the females, while training and lack of incentives had a higher extent of 74.7% each in total. These data shows that if there were incentives given and enough training for the women and girls, then the conservation of Karura forest would improve tremendously. In as much as stereotyping is not so rampant at 56%, if something could be done about it, then it would help more women and girls to get involved in forest conservation.

Table 4.17: Factors that affect the extent to which women and girls participate in Karura forest conservation

Key: VGE=Very Great Extent, GE=Great Extent, N=None, ME=Moderate Extent, LE=Low Extent

Statement	VE	%	GE	%	N	%	ME	%	LE	%
Age	15	17.2	7	8	44	50.6	17	19.5	4	4.6
Religion	8	9.2	5	5.7	53	60.9	10	11.5	11	12.6
Cultural norms	6	6.9	8	9.2	55	63.2	9	10.3	9	10.3
Stereotyping	11	12.6	12	13.8	38	43.7	16	18.4	10	11.5
Training and awareness	22	25.3	9	10.3	22	25.3	24	27.6	10	11.5

Lack of incentives	27	31.0	13	14.9	22	25.3	5	5.7	20	23.0
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4.7 Level of Community Awareness on Conservation of Karura Forest

The researcher wanted to find out if the people in the community were aware of the rules and regulations put in place to protect the forest, and if they were involved in formulating them and how well they follow the given rules. The researcher also wanted to know which means of communication was best suited in reaching as many people as possible around Karura forest and these were the findings:

When asked if the community was aware of the charcoal rules put in place, 60.7 % admitted they were aware, when it came to forest fees and charges put in place 64.3% were well aware of those rules. 50 % of the respondents also knew about forest farming rules.

Table 4.18: Level of Community Awareness and Conservation of Forests

Rules	Aware	%	Not Aware	%	Mean
Charcoal Rules	101	60.7	67	39.3	2.13
Harvesting Rules	76	45.2	92	54.8	2.38
Farm Forestry Rules	84	50	84	50	1.95
Forest Fee and Charges Rules	108	64.3	60	35.7	2.38
Constitution of Kenya Chapter 4, Part 11	77	45.8	91	54.2	2.60
EMCA Act	33	19.6	118	70.2	2.57
Energy Act	36	21.4	114	67.9	2.52
Cultivation Plan	35	20.8	111	66.1	2.52

Unfortunately, when it came to harvesting rules, EMCA Act, Energy Act, Constitution and Cultivation Plan, majority of the respondents (more than 50%) were not aware of what the regulations were about and what constituted of them. This shows that lack of information is a major contributor of Karura Forest degradation, therefore, showing that there is more need for the forest management staff to carry out forest information empowerment programmes and forums with the community, in order to ensure that they understand what is required of them, pertaining forest use.

The researcher also wanted to find out what roles different groups and stakeholders played in the formulation and regulation of rules and laws that protected Karura Forest. The results were as displayed in table 4:20 below. From the table, it is clear that religious and learning institutions are not majorly involved in making these laws and regulations as they play small roles. This could explain why they were performing poorly when it came to helping with the conservation of the Forest.

Table 4.19: Role of stakeholder in formulation of laws and regulations of Karura forest

Key: VSR=Very Small Role, SR=Small Role, NR=No Role, BR=Big Role, VBR=Very Big Role

Stakeholders	VSR	%	SR	%	NR	%	BR	%	VBR	%
Community Members	18	20.7	24	27.6	14	16.1	21	24.1	10	11.5
Religious Institutions	20	23	25	28.7	19	21.8	18	20.7	5	5.7
Learning Institutions	11	12.6	34	39.1	9	10.3	23	26.4	10	11.5
NGOs	9	10.3	10	11.5	9	10.3	38	43.7	21	24.1
Government	6	6.9	10	11.5	17	19.5	24	27.6	30	34.4
Men	5	5.7	12	13.8	30	34.5	25	28.7	15	17.2
Women	2	2.3	11	12.6	35	40.2	26	29.9	13	14.9

Men (at 45.9%) and women (44.8%) could play a bigger role than the level they are already attributed to. The NGO's seemed to play a big role in formation of rules and regulations at 67.8%, followed by the government at 62%. Community members seemed to perform poorly when it came to playing a big role in formation of rules and regulations at 21.5%. This shows that the community does not feel like it needs to obey those rules and regulations because they were put up by other institutions and stakeholders, hence, they do not own nor run the existing rules and regulation, since most of the community respondents are not aware of the existence of the existing rules and regulations stipulated by the Forest Service.

The community members were asked what their opinion was when it came to the formulation and contentment with the governing rules and regulations of the forest and also accessibility on forest information. Their responses are as shown in the table below.

Majority at 40% disagreed that they often have forums with management staff on forest conservation issues. Majority (51%) were neutral on the statement that their rights, views and concerns on forest use and regulations were respected by the forest management staff. This could show that either the communities did not understand these rules and regulations or they did, but had given up on them. Some of the respondents (37.1%) disagreed that getting information on forest products and usage was always easy and cheap. This shows that mechanisms used to promote empowerment on conservation of Karura Forest as well as understand the needs and interests of the community members are quite low and poor, needing major adjustments and re-approaches.

Table 4.20: Statements on Forest conservation

Key: SA=Strongly Agree, A=Agree, N=Neutral, D=Disagree, SD=Strongly Disagree

Statement	SA	%	A	%	N	%	D	%	SD	%
We often have forums with the forest management staff on forest conservation issues	12	7.1	37	22	51	30.4	32	19	36	21.4
Our rights, views and concerns on forest use and regulations are respected by the forest management staff	20	11.9	27	16.1	87	51.8	15	8.9	19	11.3
I am happy and content with rules and regulations put on forest resource use	23	13.7	22	13.1	83	49.4	29	17.3	11	6.5

Getting information on forest products and usage is always easy and cheap	27	16.1	18	10.7	59	35.1	20	11.9	44	26.2
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The respondents were also asked if they comply with the rules and regulations, to which 58% said they did, 25.6% said they did not and 15.5 said they did not know as table 4.22 below shows. This could indicate that the respondents that did not know were not aware of the rules and regulations stipulated.

Table 4.21: Opinion poll

Statements	Yes	%	No	%	I don't Know	%
Do you always comply with the laws given	99	58	43	25.6	26	15.5
Do you think the forest resources are being managed well	103	61.3	37	22	28	16.7

They were then asked if they thought that the forest resources were being used and managed well, to which majority of the respondents 61.3% said yes, 22% said no and 16.7% of the respondents did not know. Therefore, majority of the community members felt that the forest is being managed as it should be.

The researcher wanted to know the views by the forest staff when it came policies and regulations. The results were displayed in table 4.23 below. From the data, 52.8% agreed that the interests of the community are given adequate consideration in the stipulated laws and regulations, 48.3% agreed that communities are aware of the policies and regulations stipulated on forest resource use, the majority 36.5% of the staff were neutral when asked if community members had consented to stipulated laws and regulations. Among the forest staff members, 43.6% disagreed that there are often regular discussion forums between the forest service and the community members.

Table 4.22: Likert scale on Policies and Rules by Forest Staff Respondents

Key: SA=Strongly Agree, A=Agree, N=Neutral, D=Disagree, SD=Strongly Disagree

Statement	Strongly Agree	%	Agree	%	Neutral	%	Disagree	%	Strongly Disagree	%
The interests of the community are given adequate consideration in the stipulated laws and regulations	17	19.5	29	33.3	26	29.9	9	10.3	6	6.9
Communities are aware of the policies and regulations stipulated on forest resource use	14	16.1	28	32.2	26	29.9	17	19.5	2	2.3
Community members have consented to stipulated laws and regulations	8	9.2	19	21.8	31	35.6	21	24.1	8	9.2
There are often regular discussion forums between the forest service and the community members	8	9.2	19	21.8	22	25.3	25	28.7	13	14.9
The forest rules and regulations stipulated are adequate for forest conservation	13	14.9	19	21.8	24	27.6	19	21.8	12	13.8
Access to forest information is easy and affordable	9	10.3	24	27.6	11	12.6	12	13.8	31	35.6

When asked if the forest rules and regulations stipulated are adequate for forest conservation, 36.7% of the respondents who formed the larger group agreed that they do. However, when asked if the forest information is easily accessible, 49.4% disagreed, indicating that this could be improved. For this to happen, the researcher needed the best way to pass this information to the community and table 4.24 shows the results on which method or channel of communication would be very effective in creating more empowerment to everyone on forest management information in Karura.

Table 4.23: Effective means of communication

Key: LL=Least Likely, NS=Not Sure, ML=Most Likely, LL=Least Likely, ML=Most Likely

Means	Communities view						Forest Staff Views				Total
	Least Likely	%	Not sure	%	Most Likely	%	Least Likely	%	Most likely	%	
Radio	63	37.5	23	13.6	82	48.8	38	43.7	49	56.3	255
Television	38	22.6	11	6.5	119	70.8	69	79.3	18	20.7	255
Posters	103	61.3	21	12.5	44	26.2	66	75.9	21	24.1	255
Newspapers	111	66.1	27	16.1	30	17.9	62	71.3	25	28.7	255
KFS website	102	60.7	26	15.5	40	23.8	68	78.1	19	21.8	255
Discussion Forums	69	41.1	27	16.1	72	42.9	61	70.1	26	29.9	255

The community respondents said that the television would be the most effective way of communication at 70.8%, while the forest staff saw that the radio was the most effective way of communicating to the community at 56.3%. They both agreed that the Kenya Forest service website, poster and newspapers would be the least effective ways to communicate to community members. Therefore, the best way to communicate effectively to the community around Karura Forest was through Radio and Television.

CHAPTER FIVE

SUMMARY OF THE FINDINGS, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In this chapter, the research findings are summarized, conclusion and recommendations to the study are drawn, and research gaps are identified for future studies, as the study is aimed at studying determinants of participatory forest management on conservation of Karura Forest.

5.2 Summary of Findings

From the study findings, male respondents are the dominant group than their female counterparts and many of them aged between 26-36 years. Majority of the respondents are educated up to undergraduate level and most of the respondents, at 40% earn a salary of Kshs 10,000 and below. This shows that majority of the respondents' living conditions are poor, therefore, it is expected that they cannot afford better sources of fuel and energy such as electricity and bio-gas, hence increasing pressure on the forest's resource.

5.2.1 Stakeholder's Involvement and Conservation of Karura Forest

The stakeholders of this study included; community members, forest management staff, religious institutions, learning institutions, NGOs and the government. According to the forest staff members response, the government plays a leading role at 63.2% in the conservation of Karura Forest, followed by NGOs at 43%, then Kenya forestry society at 42.5% while religious and learning institutions play a minimal role in conservation of Karura Forest. Some of the activities that saw to the negative impact on efforts to conserve Karura forest were; Illegal firewood collection, which had a 74.7% negative impact rating from the respondents, land grabbing followed suit with a total of 60% negative impact. As an officer put it, 'The presences of stakeholders have played both a positive and negative role in the conservation of this forest. This is because positively, they contribute to revenue and technical assistance towards conservation of the forest, however, their presence has not come without conflicts on who wants

the bigger share of the resources, which has led to squabbles on land issues. In as much as much of the forest land area was reclaimed, there are still contentious issues among different stakeholders that we partner with.’

Inadequate forest management skills were also observed to be too high at 59.7%. Invasive species were thought to affect the forest by 49.7% negatively, thereby suppressing the possible positive impacts from forest conservation activities such as new trees planted in the area. Recreational activities seemed to be the one leading on the positive impact with a total of 56.3%. Staff residential houses and insufficient investment in forest resource conservation also seemed to be negatively affecting conservation efforts on the forest.

From the above findings, it is evident that stakeholder participation in conservation of Karura Forest has led both to positive and negative impacts. The negative impacts can be resonated with Garret Hardin’s (1968) theory on the tragedy of the commons, which concludes that ‘commons’ resources if not effectively controlled are due for degradation. As much as the Forest Service has a functioning institutional structure, it shows that the system of monitoring has failed in an area, it could be due to corrupt deals, or a weakening institutional structure and by-laws. This is in agreement to (Burnley, 2011) study, which concludes that although existing legal frameworks recognize the right to use land laws, it also allows for natural resource degradation, land grabbing, the purchase of occupied land, and the eviction of tenants.

Another factor that can be concluded from the findings is on the issue of ownership and rights to the handling of resources. When several stakeholders are interested in a specific resource point, there is bound to be self-centeredness and competition on who is entitled to what, why, how and to what extent. This is agreeable to (Wenfa, 2010), who states that confusion between ownership and the rights for the exploitation and handling of resources and lack of clear guidelines defining economic relations between stakeholders have resulted in the irrational allocation of natural resources and low efficiency in the exploitation and utilization of resources.

Governance can also be concluded to be playing a very big role in the formulation of structures, laws and regulations pertaining the use and management of the forest resources as shown in the study, at 63.2%. This is in agreement with (Zweede, 2006), who concluded that governance

provides the link between resources and stakeholders responsible for their protection and development of natural resources.

5.2.2 Socio-Economic Status of the Community and Conservation of Karura Forest

The study noticed from the income earned section that most of the respondents fall under the middle and low income earners. Hence it could explain how majority of the community respondents used charcoal and wood fuel (66.7%), showing the rate at which these activities affect the forest conservation efforts. Inadequate technology (55.1%), low levels of education and lack of forest incentives (50.5%) by the government were some of the observed things that continually undermined and reduced forest cover. Lack of forest incentives at 65.5% has proven to be a determining factor on the decision for communities and stakeholders to engage in participatory forest management in Karura Forest. As (Masozera, 2002) concluded in his study, economic incentives are imperative for nature conservation. This is an indication that providence of incentives is indeed an attraction point for communities and stakeholder participation in conservation of forests.

From the given findings, it can also be concluded that communities depend on the forest resources regardless of their income level. Majority of the respondents who can be grouped under the middle income level showed that their main source of energy is fuel-wood, the same response given by majority respondents who can be grouped as low income earners. This is an indication that poverty cannot be singularly ruled out as a factor on degradation of the forest's resources, but also awareness on the consequences of destructive activities. As (Gomez, 2008), reiterates, community members are largely influenced by what directly affects them most, such as access to education, infrastructure, etc, which means that forest management and conservation is usually at the bottom of community priorities, owing to relative abundance of exiting natural resources and lack of information, education and communication campaigns on the importance of conserving forests.

Educational level for majority of the respondents stand at 70%, having acquired undergraduate and diploma levels of education. This shows that majority of the respondents are well learned, and are capable of making sound decisions, however, there seems to be other underlying factors that hinder effective decision making when it comes conservation of Karura Forest, as

(FAO,2006), concluded, community needs and interest have to be monitored and addressed in order to reduce pressure on the forest resources. From the findings of the study, it is clear that education alone does not guarantee participation in participatory forest management. This is because, one of the ways of effectively partaking in participatory forest management is by understanding the existing rules and regulations, as well understanding that resources such as charcoal and fuel-wood put pressure on the forest, thereby degrading it, to which most respondents appeared not to have a clear understanding on the consequences of forest degradation, or the general rules partaking the protection and usage of forest resources.

5.2.3 Gender Differences and Conservation of Karura Forest

From the study, 50% of the respondents agreed that women are more involved in conserving the forest compared to the men. This is in agreement with (Varghese, 2012), who discovered that most men migrate in great numbers to look for better pastures, leaving women to head households, as well as take the responsibility for looking after fields, agro-forests and forests.

When asked under which gender played a higher in leadership in conservation of the forest, 42.2% disagreed that female leadership helped improve conservation, while only 24.4% disagreed that male leadership helped improve the forest cover. This result shows that male influence is better for the forest; however, it also shows an element of submissiveness and fear on part of women to partake in leadership roles conserving the forest. This can be seconded by the conclusion made by (Kiragu, 2002), that women are mostly passive participators compared to men, in that, they prefer rules given to them that being part of the team that formulates the rules and regulations on forestry.

When asked if there are equal opportunities for both men and women in conserving Karura Forest, 44.1% agreed, 32.7 were neutral while 23.2% of the respondents disagreed. However, from the percentage of male leadership (34.5%) compared to female leadership at (14.3%), it is clear that men are more pro-active in seizing the opportunities availed to the in forest conservation activities compared to women. As (Torri, 2010), concluded, relationships between genders affect hierarchies of access, use and control of resources, resulting in different needs, perceptions and priorities.

The study also discovered that age, religion and culture had neutral effect on both genders in participatory forest management, meaning they did not impact on it positively or negatively. However, stereotyping had a 56% extent affecting the females, meaning that women women's needs and concerns in relation to forest management are often neglected, giving them little power in determining development activities. This is agreeable to the conclusion made by (Martin, 1995), who found out that there is a misconception that men are the principal, or only, decision makers with regards to tree planting, management and their use. This finding can further be seconded by (Meng, 2009), who also found that women have a complex relationship with forests and the forest sector, and that the roles were overwhelmingly unbalanced in favor of men in forestry sector decision making.

Lack of forestry incentives had affected the participation of both men and women at very great extent, with a total of 74.7%. This shows that community members are more interested in activities that bring in revenue to their lives compared to those that do not bring in any source of income. Just as (Masozera, 2002), concluded, economic incentives are imperative for nature conservation.

5.2.4 Level of Community Awareness and Conservation of Karura Forest

The study found out that the community was aware of the charcoal rules put in place, at 60.7 % awareness of the forest fees and charges was at 64.3%, and 50 % of the respondents also knew about the forest farming rules. Unfortunately, when it came to the harvesting rules, EMCA Act, Energy Act, and Constitution and Cultivation Plan, majority of the respondents (more than 50%) were not aware of what the regulations were about and what constituted of them. This shows that the respondents are mostly interested in the rules that affect their use of the forest resources, and not because the rules are of any benefit to them. As (Kiragu, 2002) found out, community members only comply to the set rules and regulations just be on the safe side, in order to evade the "long arm of the law", while others play a "hide and seek" game in non-compliance.

Another finding was that women and men were not fully involved when the rules and regulations were established as they would have desired at 44.8%. Based on these findings, it can be concluded that due to lack of involvement in the policy formulation of these state-based forest

resources however, they do not always comply with these laws and regulations, as these do not embrace their interests in terms of their local needs and aspirations. Only 45.6% respondents reported inclusion of the two genders respectively. The Non-governmental organization's seemed to play a big role in the formation of rules and regulations at 67.8%, followed by the government at 62%. This can be supported by a statement from a community member that, 'NGO's have clear cut rules, that do not encourage any bias on community members they want involved in conservation of the forest. they want the best for us, such that they do not force us to part of an activity or idea that we are not satisfied with, as compared to the government body, which is not so keen in listening to our concerns and ideas.' This is apparent in (Zaman, 2011) study, which found that non-governmental organizations actively introduce their group members into social forestry, as well provide other stakeholders and community members with credit and technical support, a factor that contributes significantly to their self-sufficiency.

The study found out that when it came to complying with the forest rules and regulations majority of the respondents 61.3% said yes, 22% said no, the rest were not sure of the rules. This can attributed to the fact a good number of the respondents were not involved in the formation of most of the rules and regulations currently guarding the forest resources. As found out, community members seemed to perform poorly when it came to playing a big role in the formation of rules and regulations at 21.5%.

When asked if the forest information is easily accessible, 49.4% disagreed, indicating that this could be improved. Another factor that contributed to low chances of accessing and becoming aware of the forest conservation strategies was that frequent discussion programs between the forest service and the community were found out to be minimal. This reduced the chances of the community members to viewing their concerns and airing their views on the conservation of the forest, as well minimizing the chances of the transfer of knowledge on conservation measures from the forest service to the grass root level, which is made up of the community at large.

The study also discovered that the best way to inform the community about any forest conservation information and reach as many individuals as possible was through radio at (56.3% from the forest management staff view) and television at (70.8% from the community view). They both agreed that the Kenya Forest service website, poster and newspapers would be the

least effective ways to communicate to community members. As (Kiragu, 2002) found out, those with higher levels of education tend to read newspapers more frequently compared to those with lower or no formal education. Therefore, the best way to communicate effectively to the community around Karura Forest was through radio and television.

5.3 Conclusion

This study concludes that participatory forest management does influence conservation of Karura Forest. However, it is also concluded that as much as stakeholders have proved to positively impact on conservation of the forest, their involvement needs to be regulated with clear guidelines and rules, in order to avoid conflicts in the management of the forest resource. With the government taking the lead role in conservation of Karura Forest, it should ensure that the rules and regulations imposed on stakeholders reflect the objectives of the Forest Service, as well as respect the needs of individuals and community members. The government was closely followed by the non-government organizations in role playing of conservation of Karura Forest, however, when it comes to the formulation of rules and regulations, it has been shown the non-governmental organizations are more engaging compared to the government body. The result shows that non-governmental groups are doing an essential job in facilitating joint venture activities by bringing together forest management institutions, and the community to discuss forest management issues in and outside the forest.

Another conclusion is that income level of the community members does not necessarily influence the type of energy and fuel they use. As shown in the previous sections, both the lower and middle income earner's level depend on fuel-wood as their main source of fuel. This is an indication that regardless of one's income level, an awareness gap exists on the repercussions of degrading the forests while trying to meet our daily needs. Another concern could be success stories of 'illegal wood' collection thriving as a result of corrupt deals among stakeholders, community members and the forest officers.

Age has also proven to be an important factor as a determinant in participatory forest management of Karura Forest, with majority of the participants at 53.7% being in the age bracket of 26-36 years. This means that the individuals who can be targeted for empowerment and

transformation of forest sector are youths, an idea that can be seconded by (Faham, 2008), who found out that community participation in reforestation and development of forest areas reduced with the increase in age of the forest dwellers. This means that the earlier the younger individuals are empowered on conservation of the forest, the higher the positive impact on participatory forest management.

Education on the other hand has proven a neutral point of view on individual effectiveness on conservation of Karura Forest. From the findings, it is clear that regardless of one's educational level, yet not having any understanding on forest conservation and the consequences of putting pressures on it, it is not a guarantee that the individual partakes in the conservation of the forest. This shows that on top of an individual's education level, forest conservation awareness and emphasis needs to be promptly carried out.

The study also concludes that more women are getting involved in conservation of Karura Forest compared to men; however, there are less female leaders in the conservation efforts compared to male leaders. On the other hand, there are equal rights and opportunities given to both men and women in participating in activities pertaining to conservation of Karura Forest, however, it is the men who appear to more pro-active in utilizing the availed opportunities for their own good as compared to women. On top of this, stereotyping has been indicated to be a factor that has a major hindrance to the participation of women in conservation efforts.

The study also concludes that community empowerment positively determines participatory forest management of Karura Forest. However, easy and affordable access to information regarding forest conservation has proven a challenge to participatory forest management in Karura Forest. This can be attributed to the fact majority of the respondents disagreed that there are regular forums and discussions usually held between them and the forest management staff in order to promote the conservation of Karura Forest. The results also show that the community members only comply with the laws that directly affect the way they access forest resources such as charcoal and fuel-wood, and not particularly conversant with the others that do not affect their access to the said resources. This can also be as a result of passive participation, which involves

agreeing to rules and regulations which are passed down to an individual without his or her input, by provincial administration and forest management institutions.

5.4 Recommendations

Based on the findings and conclusion made above, the following recommendations were made:

1. Youths should be more incorporated when creating forest conservation rules and regulations, as well as when promoting empowerment and awareness on conservation of the forest. The Kenya Forest Service as well as the government of Kenya should maximize on the potential of the energy and zeal of the youths to be employed, as well involved in development activities.
2. The Kenya Forest Service and the government should ensure that there are incentives given to the stakeholders as well as community members for every positive contribution made by them towards conservation of the forest. As discovered, lack of forest incentives has shown to impact to a very great extent on participatory forest management of Karura Forest. On top of this, transparency in the formulation of rules and regulations should be ensured by the forest service, the government, as well as community forest associations, by incorporating the views of the community members on the said set rules and regulations.
3. Learning and religious institutions need to be empowered into forest conservation measures and activities.
4. Stereotyping is an issue that needs to be addressed to the community and forest management staff as well. Women and girls still need empowering on the importance of their contribution towards conservation of Karura Forest. This will eliminate their fear in engaging in forest conservation activities, and will see more female leaders taking over in the forest sector. Karura Forest Service as well as the government and non-governmental organizations should team up and carry out special programmes targeting women and girls, in order to encourage them to be pro-active in the conservation of the forest.

5. There is still more need for extensive empowerment by the forest service to the community members as well as its management staff on forest resource management and conservation, its rules and regulations. There should be more group discussions between the forest management body and the community members in order to understand and appreciate the views, needs and interests, which was in turn lead too harmonious living and sustainable use of forest resources.
6. As much as the issue on invasive species is being tackled by the Service, it needs to be fast tracked so as to avoid further degradation of the forest. Many tree species are drying up as a result of the invasion of the *lantana camara* invasive species in the forest, which has largely contributed to its degradation.

5.5 Suggestions for Further Research

This study focused on investigating the determinants of participatory forest management on conservation of Karura Forest, in Nairobi County. Further research is recommended to examine equity issues for both women and men in the community, as well as the stakeholders involved in the management of the forest. For instance, since the wealthy are more powerful financially and politically, their requirements are likely to be met before those of the poor, who then become further marginalized. In extending participation, care should be taken about what group of people may dominate. Such a study should include who has priority over whom, what and how, who plants, who has harvest rights, and to what extent.

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APPENDICES

Appendix I: Formula for Determining Sample Size

Formula for determining sample size

$$s = X^2 NP(1 - P) + d^2(N - 1) + X^2 P(1 - P)$$

s = required sample size.

X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841).

N = the population size.

P = the population proportion (assumed to be .50 since this would provide the maximum sample size).

d = the degree of accuracy expressed as a proportion (.05).

Source: Krejcie & Morgan, 1970

Appendix II: Table for Determining Sample Size for a Given Population

Table for Determining Sample Size for a Given Population

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

Note: "N" is population size
"S" is sample size.

Source: Krejcie & Morgan, 1970

Appendix III: Letter of Transmittal

Catherine A. Akinyi
P.O. Box 30513-0010
Nairobi, Kenya
October, 2014

Dear Respondent,

SUBJECT: RESEARCH ON DETERMINANTS OF PARTICIPATORY FOREST
MANAGEMENT ON CONSERVATION OF KARURA FOREST

My name is Catherine Abuto, a student from the University of Nairobi, Kenya. I am pursuing a Masters of Arts degree, and my topic is, ‘Determinants of Participatory Forest Management and Conservation of Karura Forest, in Nairobi County, Kenya,’ and would like to collect from you as my chosen respondents using questionnaires. The data given by you will be treated with confidence on a no-identity policy. You are, therefore, kindly required to fill in the questionnaires to the best of your knowledge, however, no reward or punishment will be given for choosing to undertake in this research as it is purely for academic purposes only.

Your cooperation will be highly appreciated. Thank you.



C. Akinyi.

Appendix IV: Forest Management Staff Questionnaire
Demographic Characteristics of Respondents

1. Gender: Male [1] Female [2]

2. What is your age bracket? (Please tick one)

- [1] 15 – 25 years
- [2] 26 – 36 years
- [3] 37 – 47 years
- [4] 48 – 58 years
- [5] Above 59 years

3. What is your income bracket? (Please tick one)

- [1] Below 10,000
- [2] 11,000 - 21,000
- [3] 22,000 – 32,000
- [4] 33,000 – 43,000
- [5] 44,000 – 54,000
- [6] Above 55,000

4. What is your level of education? (Please tick one)

- [1] PhD
- [2] Masters
- [3] Undergraduate
- [4] Diploma
- Other, (Specify)_____

Section I: Stakeholder Involvement and Conservation of Forests

This section examines how the involvement of stakeholders influences conservation of forests

1. What position do you hold?

- [1] Ecosystem Conservator [2] Forest Manager

2. How long have you worked in the District [for E.C] **or** in Karura Forest Zone [for Forest Manager]?

- (1) 0-3 years
- (2) 4-7 years
- (3) 8-11 years
- (4) 12-15 years
- (5) Above 16 years

3. What are your roles in forest management?

-
-
-

4. If stakeholder groups are not part of the PFM arrangement, are there ways in which their interests are communicated? Yes [1] No [2]
If yes, how?

5. Rate the level at which the organization is likely to compensate its PFM stakeholders involved in the management of Karura Forest using the following factors (Please tick for each statement)

Statement	Most Likely (3)	Neutral (2)	Least Likely (1)
Offering employment opportunities			
Giving access to forest resources			
Offering learning/research opportunities			
Offering economic incentive avenues such as bee keeping in the forest			

6. Rate the role to which the following stakeholders have played in conservation of Karura Forest (Please tick for each statement)

Statement	Very Big Role (5)	Big Role (4)	No Role (3)	Small Role (2)	Very Small Role (1)
Civil Society Organizations e.g GBM,FAN					
Government					
Professional Associations e.g Kenya Forestry Society					
NGOs					
Community Based Associations					
Religious Institutions					
Learning Institutions					

7. Rate the extent to which the following stakeholders have offered technical and financial assistance on conservation of Karura Forest. (Please tick for each statement).

Statement	Very Great Extent (5)	Great Extent (4)	No extent (3)	Moderate Extent (2)	Low Extent (1)
Civil Society Organizations					
Government					
Professional Associations					
NGOs					
Community Based Associations					

8. Rate the level to which the following factors have impacted the conservation of Karura Forest (Please tick for each statement)

Statement	High Negative Impact (5)	Low Negative Impact (4)	Neutral (3)	Low positive Impact (2)	High Positive Impact (1)
Illegal Firewood collection					
Invasive species					
Land grabbing					
Recreational activities					
Inadequate forest management skills					
Staff residential houses					
Investment in forest resource conservation					

Section II: Socio – Economic Status and Conservation of Forests

This section assesses how socio-economic status of communities influence conservation of forests.

1. Rate the level to which the following factors have impacted on conservation of Karura Forest (Please tick for each statement)

Statement	High Negative Impact (5)	Low Negative Impact (4)	Neutral (3)	Low Positive Impact (2)	High Positive Impact (1)
Charcoal use					
Timber use					
Fuel-wood use					
Bio-gas use					
Recreational activities					
Inadequate management skills					
High education level					
Low education level					
Inadequate Technology					
Distance of households and institutions from the forest					
Family size					
Training and awareness					
Benefits derived from the forest					
Lack of forestry incentives					

Section III: Gender and Conservation of Forests

This section assesses how gender influences conservation of forests.

1. Rate the level to which the following factors are an obstacle to women and girls in participating in conservation of Karura Forest

Statement	Very Great Extent (5)	Great Extent (4)	No extent (3)	Moderate Extent (2)	Low Extent (1)
Age					
Religion					
Cultural norms					
Stereotyping					
Training and awareness					

Lack of incentives					
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2. Rate the level to which the following factors are an obstacle to men in participating in conservation of Karura Forest

Statement	Very Great Extent (5)	Great Extent (4)	No extent (3)	Moderate Extent (2)	Low Extent (1)
Age					
Religion					
Cultural norms					
Stereotyping					
Training and awareness					
Lack of incentives					

3. Please tick your response on each of the following statements:

Statement	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
Gender has been integrated in the conservation of Karura Forest					
Women are more involved than men in the conservation of Karura Forest					
Men are more involved than women in the conservation of Karura Forest					
There are more male managers compared to female managers in Karura Forest					

There are more female managers compared to male managers in Karura Forest					
There are equal rights and opportunities to both men and women in conservation of Karura Forest					
Women's views on conservation of forests are respected in the conservation of Karura Forest					

Section IV: Level of Community Awareness and Conservation of Forests

This section assesses how level of community awareness influences conservation of forests.

1. Rate the role to which the following stakeholders play in the formulation of laws and regulations on Karura Forest (Please tick for each statement)

Statement	Very Small Role (5)	Small Role (4)	Neutral (3)	Big Role (2)	Very Big Role (1)
Community Members					
Religious Institutions					
Learning Institutions					
NGOs					
Government					
Men					
Women					

2. Rate the extent to which the following user rights have influenced PFM in Karura Forest
(Please tick for each statement)

Statement	Very Great Extent (5)	Great Extent (4)	No extent (3)	Moderate Extent (2)	Low Extent (1)
Collection of medicinal herbs					
Harvesting of honey					
Harvesting of fuel-wood					
Grass harvesting and grazing					
Collection of forest produce for community based industries					
Ecotourism and recreational activities					
Scientific and education activities					
Development of community wood and non-wood forest based industries					

3. Please tick your response on each of the following statements

Statement	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
The interests of the Karura community members are given adequate consideration in the stipulated laws and regulations					

Karura Forest communities are aware of the policies and regulations stipulated on forest resource use					
Karura Forest community members have consented to stipulated laws and regulations					
There are often regular discussion forums between the forest service and the Karura Forest community members					
The forest rules and regulations stipulated are adequate for forest conservation					
Access to forest information is easy and affordable					

4. Rate the impact of the following communication channels on community awareness on conservation of Karura Forest (Please tick for each statement)

Statement	High Impact (4)	Moderate Impact (3)	No Impact (2)	Low Impact (1)
Radio				
Television				
Posters				
Newspapers				
KFS website				
Discussion forums				

END

THANK YOU VERY MUCH FOR YOUR COOPERATION

Appendix IV: Community Household Questionnaire

Demographic Characteristics of Respondents

1. Gender: Male [1] Female [2]

2. What is your age bracket? Please tick one

[1] 15 – 25

[2] 26 – 36

[3] 37 – 47

[4] 48 – 58

[5] Above 59 years

3. What is your level of education?

[1] PhD

[2] Masters

[3] Undergraduate

[4] Diploma

Other (Specify)_____

4. For how long have you stayed in Karura?

[1] 0-3 years

[2] 4-7 years

[3] 8-10years

[4] 11-13 years

[5] Over 13 years

5. Are you a member of any Forest Community User Group? Yes [1] No [2]

If yes, what is its name?

Section 1: Stakeholder Involvement and Conservation of Forests

This section assesses at how the involvement of stakeholders influences conservation of forests.

- Rate the role to which the following stakeholders have played in conservation of Karura Forest (Please tick for each statement)

Statement	Very Small Role (5)	Small Role (4)	No Role (3)	Big Role (2)	Very Big Role (1)
Men					
Women					
Religious Institutions					
Learning Institutions					

NGOs					
Government					

Section II: Socio-Economic Status Communities and Conservation of Forests

This section looks at how socio-economic status of communities influence conservation of forests.

1. Which is your **main** source of energy? (Please tick one)
 - [1] Charcoal
 - [2] Gas
 - [3] Fuel-wood
 - [4] Electricity
 - [5] Bio-gas

2. Which is the **major** product/service you obtain from the forest? (Please tick one)
 - [1] Charcoal
 - [2] Firewood
 - [3] Timber
 - [4] Tree seedlings
 - [5] Recreation
 - Other (Specify) _____

3. What is your income bracket? Please tick one
 - [1] Below 10,000
 - [2] 11,000 - 21,000
 - [3] 22,000 – 32,000
 - [4] 33,000 – 43,000
 - [5] 44,000 – 54,000
 - [6] Above 55,000

Section III: Gender Differences and Conservation of Forests

This section assesses how gender differences influences conservation of forests.

(If you are a member of a Forest Community User Group, please answer questions 1-2 below, if not, skip to question 3):

1. Who is the head of your Group? (Please tick) Male [1] Female [2]

2. Rate the number of the following participants in your Group (Please tick for each statement using rates: 0, 1-3, 4-7, 8-11, and Above 12)

Statement	(Number): 0	(Number): 1-3	(Number): 4-7	(Number): 8-11	(Number): Above 12
	(1)	(2)	(3)	(4)	(5)
Number of women in your group					
Number of men in your Group					
Number of female leaders in your group					
Number of male leaders in your group					

3. Please tick your response on each of the following statements.

Statement	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
Men are more involved in conservation of Karura Forest than women					

Women are more involved in conservation of Karura Forest than men					
There are more female leaders in the management of Karura Forest than male leaders					
There are more male leaders in the management of Karura Forest than female leaders					
There are equal rights and opportunities to both men and women in Karura Forest resource use					
Women are afraid in participating in conservation of Karura Forest activities					
Men are more favored in participating in Karura Forest activities					

Section IV: Level of Community Awareness and Conservation of Forests

This section looks at how level of community awareness influences conservation of forests.

1. Rate the level to which you are aware/conversant with the following forest rules and regulations (Please tick for each response)

Statement	Very Aware (1)	Slightly Aware (2)	Not Aware at all (3)

Charcoal Rules			
Harvesting Rules			
Frm Forestry Rules			
Forest Fee and Charges Rules			
Constitution of Kenya Chapter 4, Part 11			
EMCA Act			
Energy Act			
Cultivation Plan			

2. Do you always comply with the laws given? Yes [1] [2] No

3. Currently, do you think the forest resources are being managed well? Yes [1] No [2]

4. Please tick your response on each of the following statements:

Statement	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
We often have forums with the forest management staff on Karura Forest conservation issues					
Our rights, views and concerns on forest use and regulations are respected by the Karura Forest management staff					
Men are more empowered in conservation of Karura Forest than women					
Women are more empowered in conservation of Karura Forest					

than men					
I am happy and content with rules and regulations put on forest resource use					
Getting information on forest products and usage is always easy and cheap					

5. Rate the level at which you are likely to get forest information through the following given channels of communication in Karura Forest (Please tick for each statement)

Statement	Least Likely (3)	Not sure (2)	Most Likely (1)
Radio			
Television			
Posters			
Newspapers			
KFS website			
Discussion forums			

END
THANK YOU VERY MUCH FOR YOUR COOPERATION