THE INTERNATIONAL JOURNAL OF HUMANITIES & SOCIAL STUDIES

Determinants of Community Participation in Sustainability of Indigenous Forest in Kakamega East Sub-County, Kenya

Wafula Norah
Student, Department of Communication and Development Studies
Jomo Kenyatta University of Agriculture and Technology, Kenya
Clive Malietso Mukanzi
Lecturer, Jomo Kenyatta University of Agriculture and Technology, Kenya

Abstract:
Community forestry is an approach for mitigating deforestation and forest degradation by managing the forest resources for the benefit of neighboring communities. The aim of this study was to investigate the determinants of community participation in sustainability of indigenous forests in Kakamega East Sub-County, Kenya. The study used descriptive survey research design and its targeted community youths within a sub location. A sample of 205 respondents which is 10% of the universe was used to collect data and simple random sampling technique used to identify the respondents. Data was collected using questionnaire. The study used Cronbach's alpha Coefficient (0.796) to measure the internal consistency of the questionnaire. Both descriptive and inferential methods of data analysis were used in analysis of quantitative and qualitative data. Results indicate that there was a statistically significant difference between groups as determined by one-way ANOVA ($F_{(4,151)} = 597.190$, $p = 0.000$). In addition, there was positive and significant influence of project implementation on sustainability of indigenous forest ($\beta = 0.0.684$; $t = 5.515$; $p < 0.05$). There was positive and significant influence of community empowerment on sustainability of indigenous forest ($\beta = 0.0.111$; $t = 6.324$; $p < 0.05$). There was also positive and insignificant influence of community decision making on sustainability of indigenous forest ($\beta = -0.051$; $t = 13.331$; $p < 0.05$). However, there was a negative but insignificant influence of community volunteerism on sustainability of indigenous forest ($\beta = -0.057$; $t = -.860$; $p > 0.05$) from the regression equation determined as $Y = -0.051 + 0.111X_1 - 0.057X_2 + 0.269X_3 + 0.684X_4$. The study findings will significantly inform Government and policy makers' in improving policies that support community participation in forestry conservation to provide ecological, economic, social and cultural benefits for present and future generations.

Keywords: Community participation, indigenous forest

1. Introduction

1.1. Background to the Study

Globally, forests are believed to contain more than 80% of terrestrial biodiversity ((FAO), 2012) and have consequently been the focus of particular conservation concern in recent years. They play a major role in the lives of people in the community in form of water catchment, source of timber and firewood (Ekong, 2003). On global scale, community participation in various activities is the core in the quest for sustainable development and environmental protection related issues. Participation is a process through which the stakeholders influence and share control over development initiative and the decision and resources which affect them (Ofuoku, 2011). Community involvement in tree planting in Kenya is as old as modern agro forestry that started in 1971. However, certain biophysical environmental factors have not worked against the concept of community participation in tree planting. Forests can either be exotic in nature or indigenous like a big percentage of Kakamega Forest managed by the forest department and Kenya wildlife Service (KWS). In many areas, native forests are being subjected to intensive human disturbance, through activities such as cutting, burning and browsing by livestock. How to build consensus among all stakeholders surrounding the issues of sustainability is one of the primary challenges facing the resource-based projects (Appiah, 2013).Governments own and manage more than 80% of the world's forests (FAO, Global forest resource assessment, 2010) but a trend toward community-based forest management (CBFM) has gained momentum over the past 30 years (Agrawal, Chhatre, & Hardin, 2008); (FAO, Global forest resource assessment, 2010).

In addition, Vanhanen, Rayner, Yasmi, Enters, FabraCrespo, Kanowski, Karppinen, Mainusch, and Valkeapa¨a, (2010) stipulated that forest stakeholders are people who depend directly on forests or participate in their management such as forest communities, forest managers and companies, conservationists, forest policy makers, development organizations, and scientist. They are facing the challenges related to understanding vulnerability, identifying adaptation

options, and implementing adaptation with the changing of economic, social, global political environments and adaptation to climate change. Forest stakeholders are concerned and continuously have to deal with the questions of how the forests should look, what kind of products services and experience it should be able to provide, and what functions the forest should perform.

Community-based forest management is an approach to mitigate deforestation and forest degradation by addressing their negative impacts on rural livelihoods through protective measures (Karky & Banskota, 2007). It became widespread as a collective forest in China, a community-based forest in Philippines, and a community forest in Nepal (Karky, Who will grow the forest, bring benefit, and save the earth? (Vol. XII), 2005). Nepal is one of the pioneering countries with successful implementation of a community indigenous forest (Aryal, Bhattarai, & Devkota, 2013; Joshi, & Aryal, 2014). In this approach, local users develop operation plans, set harvesting rules and prices for forest resources (United Nations Conference on Sustainable Development [UNCSD], 2012). A total of 1,665,419 ha of forest were handed over to 17,810 community forest user groups (DoF, 2013).

Furthermore, participation and collaboration, both within the group and between project partners, are central tenets of effective group operation. Inter-group collaboration may also occur, as, for example, where there are complementary restoration objectives, in order to increase efficiencies in resourcing and achieve greater restoration outcomes (Whangare, 2010) and Land care Trust, 2013). Partnerships with external bodies and agencies generally provide groups with goods and services such as training and technical advice (Handford, 2011). Community environmental restoration projects are shaped by the intersection of the physical environment, social and economic factors (Clewel & Aronson, 2013). In some cases, a project is designed to pilot an approach, and the intended result is sustained project ideas. This should involve a clearly documented description of the approach, and evidence of its effectiveness, so that other organizations can adopt it in the future.

1.1.1. Community Participation and Sustainability of Indigenous Forests: Global Perspectives

The role of community groups in a study by Peters, Hamilton and Eames (2015): Review of community environmental restoration in New Zealand typically carried out an extensive range of activities spanning pest and weed control, education, advocacy, and administrative tasks (Cowie, 2010);(Hardie-Boys, 2010);(Ritchie, 2011); (Harrison, 2012). This is reflected in groups' objectives, nearly three quarters of which incorporated a social dimension despite most groups' affiliations to organizations with conservation and/or restoration of indigenous forests as a primary focus. The synergy between groups' social and environmental dimensions can be explained by examining motivations for participation in community groups. These include the ability to contribute to the community, enhanced social interaction, and opportunities for personal development, learning about the environment, being an environmental steward, and developing an attachment to a place (Measham & Barnett, 2008). A key role for groups was to generate and disseminate environmental information, evidenced by the predominance of groups' educational, advocacy-related and submission-writing activities.

Similar to other regions in the world, Lintangah and Weber (2015) in the Implementation of sustainable forest management: an application of the triple perspective typology of stakeholder theory in a case study in Sabah, Malaysia; an important question was whether or not community values were adequately represented undercurrent policies, land management and tenure systems, certification schemes, management planning, and current research priorities (Kozak, Spetic, Harshaw, Maness, & Sheppard, 2008). A case study on evaluation of SFM implementation in two forest management models in Vietnam and Malaysia by (Le, Lintangah, Pretzsch, Weber, & Bao, 2012) suggested that greater involvement from private sector and other stakeholders, including the local people, can advance the performance of forest management practice at the FMU level. Community participation in SFM implementation differs based on contribution of SFM to their livelihood, cooperation and conflict level with FMU holders, issues and problems, and overall perception of their livelihood affected by the SFM implementation at the FMU level. The study findings of the study revealed that contribution of SFM implementation rated at 'very low' by most of the respondents was confined to the provision of opportunities for human-resource development and attending courses (52.62% of all respondents) (Lintangah & Weber, 2015).

In the early 1990s, the government of Cambodia approved a community forestry approach to help reduce deforestation (FA, 2013; Ty, 2013) and integrated community-based forest management into policy and planning (RGC, 2013). Under the National Forest Programme, the goal was to allocate 2 million hectares for community forestry management by 2029 (FA, 2013). Despite wide recognition of the socio economic and environmental benefits of community forestry in Cambodia, little is known about its achievements and shortcomings or the challenges that sustainability presents, especially after the stoppage of external support. Further, there does not appear to be a widely shared understanding of the concept of sustainable forest management.

Community forestry is increasingly being recognized for its social, economic and ecological importance, and more community forestry groups are being set up. However, as the case study of Osoam community forestry reveals, the critical issues of insecure land tenure, disorganized local institutions and insufficient technical and financial support risk undermining the overall aim of achieving sustainable forest management and poverty reduction, (Clements, Ashish, Karen, Dan, Setha, & Milner-Gulland, 2010). Community-based forest management is an approach to mitigate deforestation and forest degradation by addressing their negative impacts on rural livelihoods through protective measures. It became widespread as a collective forest in China, a community-based forest in Philippines, and a community forest in Nepal. Nepal is one of the pioneering countries with successful implementation of a community forest (Aryal et al., 2013; Joshi, & Aryal, 2014). In this approach, local users develop operation plans, set harvesting rules and prices for forest resources (UNCSD, 2012).

To make any forest sustainable, harvesting methods should not reduce future harvests, regenerating populations of all native species should be maintained at the landscape level, and forestry practices should be economically sustainable for the human population (Nesheim & Halvorsen, 2011). There is a great challenge in modern forestry to manage a forest for multiple goals including biodiversity conservation (Trotter & Whitham, 2011). But Nepal's community forest was already taken as a successful example of a green economy (Sukhdev, Stone, & Nuttall, 2010), as it encourages active participation of local people in managing forest products. It has the benefits of reducing poverty, addressing social exclusion, and creating rural employment (Moss, 2012; Kanel et al., 2009; Patel et al., 2013) and carbon sequestration (Gautam & Watanabe, 2009).

In the public participation discourse, where a project failed to involve the community, the likelihood of project functioning to logical end is limited. Projects are usually expected to achieve the sustained participation of families, participating organizations, staff (paid and volunteers), and the broader community. This participation may occur in the planning stages for a project, during implementation, and after the project has formally ended. Given that community participatory processes are known to be expensive, demanding and time-intensive, it is vital to better understand the effect of this approach on the sustainability of community development projects. In a study conducted by Mansuri and Rao, (2004), little is known about the effects of community participation on community-based projects. They attribute ignorance on this matter to a lack of thorough and systematic evaluations with counter factual. Moreover, Mansuri and Rao, (2004a) asserted that robust evidence regarding the influence of community participation is required urgently.

1.1.2. Community Participation and Sustainability of Indigenous Forest in Kenya

In Kenya the formation of CFAs started in 1997. By July 2014, 98 management plans had been developed and 60 Management Agreements had been entered into between the Kenya Forest Service (KFS) and CFAs, in view of the 200+ forest stations in Kenya (Ayiemba et al., 2014). The independence period saw the introduction of the Shamba System of forest management in a bid to facilitate community access to forests. The period between 1986 and 2003 was characterized by policy inconsistencies that were animated by contradictory government objectives that sought both conservation and excision for political purposes. The period between 1990 and 2000 in Kenya, was marked by pronounced declarations of the State re-affirming its commitment to forest conservation yet in reality, the period was marked by increased excisions. For instance, compared to the period between 1933 and 1993 when the forest lost 6,926 hectares out of the original 23,632 hectares (an average of 0.5% annually), the period between 1994 and 2003 saw the forest lose 5,600 hectares (an average of 3.4% annually) bribing its total size to 16,706 hectares (Biota, 2004).

The most recent assessment of the vegetation cover of Kenya was carried out for the Water Master Plan (2010).This analysis indicates that there are 1.24 million ha of closed canopy indigenous forest left, out of an original possible cover of 6.8 million ha; representing almost 18% of the potential closed canopy vegetation cover, but only about 2% of the land area of Kenya. There is potential conflict between closed canopy forest and agriculture because these forests occur in the areas most suitable for many agricultural crops, including the staple crop, maize. Not surprisingly, much of the potential forest area has been cleared of natural vegetation and converted to agricultural land. Forest plantations of exotic species have also been established on these more productive areas. The institutions managing forest and conservation interests have been under resourced (Trefon, 2008; Mbala & Karsenty, 2010) in terms of numbers, but also with respect to training and office equipment. Only a small percentage of employees have any educational training beyond secondary school. Access to civil service employment is based on political patronage.

The Forest Act of 2005 saw the formation of the Kenya Forest Service (KFS), a semi-autonomous government agency with representation from various government ministries. Under the Act, the KFS is expected to devolve powers to the private sector and to forest conservation committees and community forest associations (CFAs). Community participation is achieved primarily through CFAs, and integrated management of forests is the central principle motivating the new policy (Ongugo, et al., 2007). A number of CFAs have been formed through sensitization of communities adjacent to the major forests in the country by the Kenya Forest Action Network (FAN) and the Kenya Forests Working Group (KFWG), (Ongugo, Mbuvi, Maua, Koech & Othim, 2007). Lately, the Kenya Forest Service has also been spearheading the formation of CFAs as a step towards meeting the requirements of the Forest Act (2005). The CFAs rely only on membership fee and subscription by members as their main sources of funds (Kinyanjui, 2007).

In Kenya, several studies have been carried out on factors determining adoption of tree planting practices. Community participation leads to empowerment of the community; empowerment centers on individuals developing a critical understanding of their circumstances and social reality, (Davids, 2009). Community Participation in Kenya has evolved through a long process of economic reforms where community projects have played a major role in providing services to the public.

1.1.3. Community Participation and Sustainability of Indigenous Forest in Kakamega East

The Forests Act (2005) allows members of forest communities from the same location to join forces and register community forest association for members to participate in forest conservation. This led to the formation and registration of MUILESHI CFAin 2005 and 2009 respectively (Osumba, 2011) to participate in conservation of Kakamega Forest. The CFA which is currently working in partnership with the Kenya Forest Service, Kenya Wildlife Services, National Environmental Management Authority (NEMA), Donors and the County Government Administration in the management of Kakamega forest is made up of Six Community Based Organizations namely MU-SHA, BU-SH, SHA-MU, IKU-CHI, KAKOFA and KEEP CBO (Ming'ate, Letema, & Obiero, 2016). Members of the community around the forest join the CFA by first becoming members of the Village Forest Conservation Committees (VFCC) who later elect members from within at the

grass root level to represent them in CBOs and the CFA. The association is mainly involved in management and conservation of Kakamega Forest which includes tree nursery establishment and afforestation (Ongugo, Mogoi, Obonyo, & Oeba, 2008).

Kakamega forest is the only remnant in Kenya of once a great tropical rain forest that stretched across central Africa, also known as the Guineo-Congolian. It consists of Kakamega forest reserve and Kakamega national reserve. Kakamega forest reserve has two nature reserves namely Isecheno nature reserve and Yala river nature reserve while Kakamega national reserve falls under KWS Buyangu office. Kakamega forest was first gazette as a Government forest in 1933 then covering 23,780 hectares. The protected area currently covers 17,838 hectares out of which indigenous forested area is about 14,000 hectares (Muller & Mburu, 2009). Ecosystem services provided by tropical forests are becoming scarcer due to continual deforestation as demand for forest benefits increases with growing population (Mutoko, Hein, & Shisanya, 2015). The settlements around the forest are densely populated with a mean household size of six members in the rural areas. Majority of the population depends on this forest for fuel and household timber extraction. Despite the indigenous forest a rich source found in the Sub-County and; formation of groups to participate in conserving the virgin forest, poverty level is still rated high at 57% according to census report 2009. Sustainability is not only ecological or economic but social. The main challenge in forest management is to reconcile extraction needs with conservation interests by offering local people a proper mix of incentives. The challenge is ominous in the case of Kakamega forest whose future existence has become a matter of concern (Guthiga & Mburu, 2006). The management of indigenous forest in Kakamega East Sub-County has received mixed reaction by the community members as different CBOs regroup. There has been a sharp controversial debate on the participation-sustainability nexus with little consensus. However, it is not clear whether participation of the community in forestry projects leads to sustainability. It will be challenging to achieve sustainability of the indigenous forest in view of structures and processes if the community participation is not able to distribute power and provide opportunity to act and influence what is important.

1.2. Statement of the Problem

Forests make up about 30% of the global total area (Osumba, 2011). Decentralization of forest management has been an increasing trend worldwide (Agrawal, Chhatre, & Hardin, 2008). The idea was a result of governments' recognition of the critical role that can be played by the local adjacent communities in ensuring that the tree cover in the country increase to the internationally recommended 10%. Kenya's forest sector has experienced poor performance in the past, and improving forest governance has been an implicit objective in forest sector reforms over the past 10 years (National forest policy, 2014). It is on the basis of this that participatory forest management was introduced that led to the formation of CFAs as per the Forest Act 2005.

The inclusion of communities in forest management is, in essence, an approach towards achieving forest sustainability and biodiversity conservation with socio economic objectives (Ongugo, Mogoi, Obonyo, & Oeba, 2008). However, this is not always the case. Even where partnership structures exist, studies have shown that the characteristic processes of governance often preclude genuine participation on the part of community partners (CAG Consultants). Failure to continue programme developments means that efforts to involve local people in forest conservation activities fail (Suharti, 2001). Majority of Kakamega forest community are primary dependent on the forest for their livelihood. Youths in surrounding communities are mostly unemployed, thereby eking their livelihood illegally from forest (GoK, Kakamega Forest Strategic Ecosystem Management Plan 2015-2040, 2015).

Sustainability is dependent on community's involvement in conserving the forest and conservation must pay in order to avoid starving and destruction of the forest. The community living around the forest can realize source of livelihood from the forest for instance through sericulture, tree nursery establishment, ecotourism, bandas, butterfly farming, snake farming (GoK, 2012) among others. The forest in this area is not only of economic significance, but also works as a barrier to soil erosion, protects water catchments, micro-climate regulation, wildlife conservation and cultural sites. Ongugo et al (2008) indicated that CFAs have had their shares of challenges like mismanagement and disintegration, heterogeneity within members of association causing more conflicts and varying interests and objectives for forming the association. The ever-increasing conflict among the community members on indigenous forest resources makes a participatory process of local knowledge purely insufficient. However, for sustainability to become a routine of indigenous forest management there is need for clarity about the role of community participation on sustainability of indigenous forest. Youths must understand its role in forest management in order to realize continuous livelihood and forest conservation for sustainability. Based on the sustainable practices of indigenous forest related information above, the different factors influencing of community groups to ensure sustainability of indigenous forest is an essential requirement for policy and academic knowledge acquisition. This research therefore seeks to fill this knowledge gap and inform both policy and academics on the determinants of community participation in sustainability of indigenous forest in Kakamega East Sub County.

1.3. General Objective

The main objective of the study was to investigate the determinants of community participation in sustainability of indigenous forest in Kakamega East Sub-County.

1.3.1. Specific Objectives

The following specific objectives guided the study:

- To determine the influence of community decision making in sustainability of indigenous forest in Kakamega East Sub-County.
- To assess the influence of community volunteerism in sustainability of indigenous forest in Kakamega East Sub-County.
- To determine how community empowerment influences sustainability of indigenous forest in Kakamega East Sub-County.
- To determine the influence of community project implementation in sustainability of indigenous forest in Kakamega East Sub-County.

1.4. Research Hypothesis

The following research questions guided the study:

- Ho: There is no significant relationship between community decision making and   sustainability of indigenous forest in Kakamega East Sub-County?
- Ho: There is no significant relationship between community volunteerism and sustainability of indigenous forest in Kakamega East Sub-County?
- Ho: There is no significant relationship between community empowerment and sustainability of indigenous forest in Kakamega East Sub-County?
- Ho: There is no significant relationship between community project implementation and sustainability of indigenous forest in Kakamega East Sub-County?

1.5. Significance of the Study

Sustainability is inevitable as far as forest resource management is concerned. The study findings will help the Government and policy makers' in improving policies that support community participation in forestry conservation to provide ecological, economic, social and cultural benefits for present and future generations. The findings will help community members as effective participants and beneficiaries of the forest with knowledge of participation that helps them in proper management of the forest. Kenya forest service through their managers may use the findings to advice the community on better ways of managing the forest in order to abate forest decline as has been witnessed in the past. The information generated by this study will also be useful to other scholars by aiding further studies on sustainability of indigenous forests in Kakamega and elsewhere.

1.6. Scope of the Study

The study was conducted in Virhembe sub location around Kakamega Forest. Kakamega forest is found in Kakamega East Sub County, Kakamega County, Kenya. It is situated in western Kenya, 35 KMs from Lake Victoria, and approximately 1.6-22.4 KMs East of Kakamega town at the nearest and furthest points respectively. According to the Strategic plan 2015, Kakamega Forest was declared a forest area by proclamation No. 14 of 13th February 1933 which set aside 23,77.3 Ha as Kakamega Forest together with the Malava block. Currently it covers 19,792.4 Ha in size after several excisions over time. The aim of the study was to investigate the role of community participation in sustainability of indigenous forest in Kakamega East Sub County, Kenya. The unit of analysis was one youth per household within Virhembe sub location. Article 55 of the Kenyan constitution defines youth as those aged between 18 and 35 years. The study was carried out from September to October 2018.

2. Literature Review

2.1. Introduction

This chapter highlights the relevant literature review of the study. It presents theoretical framework, conceptual framework, sustainability of indigenous forests, and Empirical literature.

2.2. Theoretical Review

Theoretical framework is the structure that can hold or support a theory of a research study. The theoretical structure introduces and describes the theory that explains why the research problem under research study exists. Alan (2008) asserts that theories are formulated to explain, predict, and understand phenomena and, in many cases, to challenge and extend existing knowledge, within the limits of the critical bounding assumptions. A good theoretical framework gives a strong scientific research base and provides support for the study. This study will be based on:

2.2.1. Stakeholders' Theory

The role of community participation is not always straight forward, and many indigenous communities are searching for meaningful and culturally appropriate ways to understand, measure, teach, and practice sustainable development and sustainable natural resource management (Whyte, 2014). The involvement of stakeholders in community forestry projects is widely recognized as a fundamental element of the process. A stakeholder is confined to many stakeholders who are directly or indirectly affected or can affect indigenous forest management in practice. These include the local community around the forest, government agencies, the donors and the NGO's. Stakeholders' theory provides the foundation for stakeholder identification, classification, and categorization and; to understand their

behaviour (Aaltonen, 2011). The stakeholders involved can be divided into two main categories of internal and external stakeholders.

Borrowing from the stakeholders' theory, the current study examined the significant role of community participation in sustainability of indigenous forests in Kakamega East Sub-County. Community forest management involves efforts to include the people who live in and around forests in decisions about the forest's management. It devolves the decision-making power to the community and the members of the community benefit directly from the forest management. In principle, community forest management can create a source of stable income by providing incentives for local communities to keep their land forested, thus conserving biodiversity and ecosystem services and contributing to poverty reduction and economic development (Anderson, 2011).

2.2.2. The Process Approach: People Centered Development by David Korten

Korten viewed effective community controlled social organizations as important if not essential instrument for conserving the indigenous forest for the rural poor, to give meaningful expressions to their views, mobilize their own resources in self-help action and enforce their demands on the broader national political and economic systems (Korten, 1980). He proposed a people centered strategy that co-operated the values of inclusiveness and sustainability in managing community projects. Sustainability is an inherent component and explicit goal of people centered development. Managing forests sustainably is critical not only to balance competing uses in the short term but to ensure we can enjoy forest benefits for generations to come. Forests are critical for sustainable development. They provide a wealth of goods and services that are essential for people's lives, livelihood and the green economy. Maintaining and enhancing our planet's forest resources is essential if we are to succeed in the global efforts to alleviate poverty, address water scarcity and biodiversity loss, and mitigate climate change (Australian Forestry Standards Certification, 2010).

Sustainability is an inclusive and ambiguous concept precisely because it brings society's ecological dependency into moral relation with its ecological and political systems Sustainable forestry defined as the practice of managing dynamic forest ecosystems to provide ecological, economic, social and cultural benefits for the present and future generations (Kiefaber, Gass, & Rickenbach, 2009). Fairness is an important component of sustainable forest management especially in sharing of benefits and costs of forest use. Participation actually brings the public into the decision-making process to create consensus, own and support the forestry programs. Individuals have greater incentives to pursue sustainable environmental practices when resources are locally owned.

Ecologists propose to sustain biological diversity and ecological integrity by focusing on the health of the living world (Willis Jenkins). Their argument from anthropocentric point of view is that, essential natural resources should be sustained, as should those ecological systems and regenerative processes on which human systems rely. David Korten claims that people centered development is the only way to develop sustainable communities; while disagreeing with the practice of increased economic output through natural resource depletion. Lack of legislation to protect human rights as well as the environment may impede community participation in development projects. But according to Holder and Chase (2011), local communities that have long been excluded by the central government from participation in forest policy have now become participants under the process of decentralization of forest management. This approach addressed the variables of community participation and forest sustainability. The approach however did not focus much on time and quantifiable outputs.

2.2.3. Participation Model: Adam Fletcher – Ladder of Volunteer Participation

This study employed the ladder of participation approach to sustainability as posited by Adam Fletcher. Adam Fletcher developed the ladder of volunteer participation with the understanding that volunteerism should be emancipatory for all the stakeholders involved (Fletcher, 2012). The model ranks community participation into seven rungs to include a situation where volunteers manipulate community members all the way to the final one where volunteers allow community members to initiate and share decision with them in their efforts towards sustainability of the indigenous forest. The model views community members as insiders from the community who have been there historically and; volunteers as outsiders who have traditionally come into the communities to provide their services.
The Community Forest Association focuses mainly on community participation for the sustainability of the forest. Under the assumption that local conservation can contribute towards conservation, various policies have sought to increase the participation of local communities in conservation, but not always with success (Maria Eclene et al, 2015). However, as Macharia (2015) asserts, participatory processes increase the likelihood of success as they provide opportunities for community members to participate, receive feedback and jointly develop new ideas over a period of time thus sustainability. Sustainability is a crucial factor in every project implementation.

People around the world over engage in volunteerism for a great variety of reasons: to eliminate poverty, improve basic health and education, provide safe water supply, to tackle environmental issues and climatic change, to reduce the risk of disaster and combat social exclusion and violent conflict. In all of those fields, volunteerism makes a specific contribution by generating wellbeing for people and their communities (UNV, 2015)

Participation model represents an alternative to mainstream top-down development in a community. Under this delivery approach the people acted merely as objects and had no right to make any suggestion about forest management activities. Participatory forest management heralded new thinking in the forestry sector where local communities would be involved in the management of forests through community forestry, participatory forestry and joint forestry (Osumba, 2011). This study will embrace Adam Fletcher's model of participation as a process of empowerment since participatory

development tries to foster and enhance people's capability to have a role in their society's development. The challenge is; some organizations in the community work to keep the insiders from the ladder when their processes fail.

2.4. Review of Variables

2.4.1. Community Participation

Local stakeholders' participation is a very fashionable topic in literature dedicated to natural resources management and conservation (Nguinguiru 1999). It seeks to engage local populations in development projects for sustainability. In management of indigenous trees or forests, the participation or at least, the consultation of concerned stakeholders is a duty prescribed in the legal policy. The initiatives in management had been necessitated partly by the need to stop the escalating destruction of natural and plantation forests that had been increasing under old forest policy and laws, and partly the need to open devolve governance to accommodate local communities and other stakeholders to take part in forest governance (Osumba, 2011).

Beyond the legal obligation, stakeholders' involvement in decision-making process is also an empirical requirement. According to Forest Act (2005), a member of a forest community together with other members or persons may together with other members or persons resident in the same area register a community forest association under the society's Act. The government's main objective for starting participatory forest management was to promote the participation of the community and other stakeholders in terms of decision making and involvement in forest management to conserve water catchments, create employment, reduce poverty and ensure sustainability of forest sector (Osumba, 2011). The idea was a result of government's recognition of the critical role that can be played by the local adjacent communities in ensuring that the tree cover in the country increase to the internationally recommended 10%. Kakamega forest is important water shed for some of the rivers that flow into Lake Victoria. The forest ecosystem plays a very important role in provision of ecological, social and economic services to the local community and country at large (Ming'ate, Letema, & Obiero, 2016).

People participatory may take on a variety forms, but they commonly share the objective of mobilizing the populations around the implementation of a project whose objectives have already been defined by political or economic decision-makers. How the competing interests are resolved determines the form and level of participation that is observed in a particular community development project as it unfolds (Zetter & Hamza, 1997). To make any forest sustainable, harvesting methods should not reduce future harvests, regenerating populations of all native species should be maintained at the landscape level, and forestry practices should be economically sustainable for the human population (Nesheim & Halvorsen, 2011). There is a great challenge in modern forestry to manage a forest for multiple goals including biodiversity conservation (Trotter &Whitham, 2011). It has the co-benefits of reducing poverty, addressing social exclusion, and creating rural employment (Moss, 2012; Patel et al., 2013) and carbon sequestration (Gautam& Watanabe, 2009).

2.4.2. Community Decision Making

Local communities and forest-user groups now govern an estimated 200 million ha of forests (Sandbrook et al., 2010). A key objective of CBFM is to devolve power in forest management from central levels of governments to local communities, thereby empowering communities to make decisions about the resources that are important for their livelihood (Kellert et al. 2000, Blaikie, 2006). The concept of community participation is not fully satisfied by just receiving people's contributions in form of labour, cash or kind. Participation must contain elements of initiative and decision, emanating from the community itself (Suharti, 2001). The basic principles of CBFM include public participation and democratic decision-making processes (Borrini-Feyerab end et al., 2004). Participation in forest management groups has been shown to influence decisions to plant more trees on-farm (Emtage& Suh, 2004), and participate in forestry projects. Perhaps this is due to the fact that it enhances people's attached value to forest ecosystems and the need to protect them; which in turn results in their desire to increase forest cover on their farms. Moreover, participation in community-based conservation groups enhances farmers' access to diversity, quality and quantity of tree species (Boffa*et al*, 2005). The influence of Benefit sharing in decision-making among the smallholder households has been recognized in literature. Eshun (2008) indicated that it is expected that as one owns a resource, he gains some benefit from it. Numerous benefits are expected to accrue to individuals from participating in forestry programs. As a result, we include the sharing of benefits in our study. However, some studies have shown that the local farmers' knowledge must be the key element of efforts to motivate plantation of trees on farms since local people and scientists may not necessarily share the same view (KoKu, 2002). Therefore, it is important to understand what the local farmers know and how it affects on their decision on conducting farming activities and forest development projects.

Besides Participation in community forest management, households' decisions to plant trees may be directly influenced by household-specific, plot-specific and institutional factors. For instance, farm forests have enormous environmental advantages beyond direct benefits to the farm households. To comprehend these indirect benefits, the decision-maker at household level requires some education, either formal or informal, obtained through schooling or extension services. Thus, better educated household heads or households with access to government or farmer-farmer extension services are better adopters of farm forestry (Muneer, 2008), either because they view tree planting as a means of improving the land or because they are able to appreciate other non-quantifiable benefits as ambiance, micro-climate modification or carbon sequestration. This also explains why households with good social networks may have a higher possibility of planting trees because they are able to get extension services through such networks (Gebreegziabher *et al.*,

2010; Muneer, 2008). Farmers, moreover, have detailed knowledge concerning ecosystem services, trade-off among agro forestry components as well as its interactions (Cerdan et al., 2012). This influences their decisions on managing their farming system and choosing the final products.

Participation by gender is considered a main factor in assessing sustainability. Men and women have different opportunities, motivation and capabilities to involve themselves in collective action (Pandolfelli, Meinzen-Dick, &Dohrn, 2007). Community participation demands change in attitude of its members towards women in a patriarchal society. While community members have come forward to embrace the 30% affirmative action towards women participating in development projects including forest projects, the household heads have to switch their ways from control to involvement of its members in decision making for its project sustainability. Domestic responsibilities may also reduce chances of women and youth to participate in groups. Because of this, we consider social inclusion in the participation analysis.

Current literature has confirmed that it is not clear on how one can design long lasting institutional arrangements for a functioning CFA that are appropriate for governance of tropical forest in a way that they can deliver significant livelihood to the poor forest dependent communities (Ming'ate, Letema, & Obiero, 2016). However, Institutional factors have been shown to influence the decision by households to plant trees and participate in the forestry projects. Secure land tenure arrangements, for example, have been found to influence tree planting decisions among farmer groups. Trees take a longer gestation period and only farmers who are confident of continued use of a given plot would be encouraged to plant them (Bannister & Nair, 2003; Gebreegziabher *et al.*, 2010). Some studies however do not agree with the idea that secure tenure may encourage tree planting and cite cases where communal ownership of land has been more conducive for development of farm forestry (German *et al.*, 2009). Perhaps tree planting in areas with ambiguous land tenure system is a means used by households to place a claim of legitimacy of ownership and/or access.

2.4.3. Community Volunteerism

Volunteerism refers to the offering of an individual's or group's time, skill or resources to provide services by free choice for the benefit of other individuals, communities or nations, without the expectation of financial gain other than reimbursement of reasonable expense (The National Volunteerism Policy, 2016). It is an important tool for active community participation in managing natural resources for development purpose. In Kenya, driven by the Harambee spirit local communities could come out and join hands to conserve the natural resources around them. To ensure continuity, there should be meetings for ongoing communication throughout the project period to sensitize the community on the benefits of managing the natural forest sustainably. However, without adequate guidelines on protection of rights and welfare, trainings and safety, the spirit of goodwill in the community forest associations is taken away thus decreasing the chances of the organizations to survive.

Volunteer activities and practices towards forest sustainability have remained uncoordinated between the implementing partners and inadequately supported by our local communities. People are key actors in socio-ecological system and disregard for local claims and needs has resulted in failure of many forestry projects (Vanhanen, et al., 2010). People in the world over engage in volunteerism for a great variety of reasons such as to eliminate poverty, to tackle environmental issues, to reduce risk of disasters or to combat social exclusion and violent conflict. Involvement of social network and support from NGOs increase the likelihood of members volunteering in forest activities that could lead to forest protection. However, with too much dependence on donor resources while ignoring the potential of the local communities to provide and sustain their own projects, failure becomes inevitable. In Zimbabwe loss of NGO support that followed the end of donor funding had severe negative effects on outcomes (Mashinya & Balint, 2007). Because of this the participatory role of communities in planning and budgeting will enable stakeholders to identify resources among communities which can be used in programs, projects and activities reducing their dependence on donors. Empowering the local communities through sustainable allocation, management and exploitation of resources are key elements of poverty alleviation. Communities often need to reinforce programmes for knowledgeable forest volunteers at grass root levels within and around the forests and mobilize resources to reclaim responsibilities in community participation towards forest sustainability. Volunteers are motivated by values like those of justice, equality and freedom as expressed in article 55 of the Charter of the United Nations.

Volunteerism is considered a philanthropic act intended to promote good practice or improve the quality of life for the people living within and around the forest. Dealing with environmental problems requires solutions sensitive to local social and ecological conditions. Ideally, implementation of participatory forest management requires a community with volunteers who are able to identify people's felt needs. This is because it ultimately creates people's genuine interests in the forestry projects. A study by (Suharti, 2001) revealed that local people's feelings and knowledge which were often neglected before began to receive some attention after it was realized that indigenous knowledge is also useful and valuable in certain circumstances. Provision of friendly platforms for implementation of forest programs by volunteers can increase forest participation. There is need to device more people centered approaches which stress empowerment and participation. The developing grass root volunteerism can be an enclave among various organizations and may be able to work towards development of civil society in developing countries (Xu & Ngai, 2011).

2.4.4. Community Empowerment

Empowerment expands the capabilities of the poor to undertake future self-help programs through the concept of participation. It is a people orientated approach of making the community involved in the whole process rather than one with a focus on processes and systems, which can exclude the community. It is the expansion of assets and capabilities of

poor people to participate in, negotiate with, influence, control, and hold accountable institutions that affect their lives (Narayan, 2002). Empowerment expands the capabilities of the poor to undertake future self-help programs through the concept of participation.

Participation in development projects is a strong form of empowerment practice. It entails building capacity of the community so that they can make rational decisions and undertake meaningful input for mutual benefit. It does not necessarily entail the equal sharing of power (Meshack, 2004). Information is a key and knowledge are power. Informed citizens are better equipped to take advantage of opportunities. The extent to which companies seriously support community participation depends on how far they are aware of and understand its importance and on how far they are willing to transfer some of the profits gained during their operations in the area and to the local people living around their concession (Suharti, 2001). The relevance of this information is especially important if the poor are to take effective action (Narayan, 2002). Protecting and respecting the rights of local communities, indigenous peoples, and workers in the forests is an important part of sustainable procurement. Other benefits include the skills and knowledge acquired through the participatory learning process which will be useful in other areas of rural development (Suharti, 2001). In his conclusion asserted that local peoples feeling and knowledge which were often neglected before, began to receive some attention after it was realized that indigenous knowledge is also useful and valuable in certain circumstances. This constitutes a significant indirect benefit for the population. The increase awareness of villagers' communal and individual rights and a better understating of the process, by which these are maintained, is a crucial indirect benefit that has resulted from participatory forest management operations.

In a study by Musyoki, Mugwe, Mutundu, and Manchuria (2016) on Factors influencing level of participation of community forest associations in management forests in Kenya, training and capacity building in forest conservation and management of indigenous forests was identified as a factor contributing to high level community participation of CFA members in forest patrol (50.7%), fire control (71.6%), tree nursery activities (70.1%), and tree planting (44.8%). A majority of the CFA members who planted trees in their farms had a high level of participation in PFM and a high benefit perception. Thus: the level of CFA participation and their perceived PFM benefits influenced tree planting on the farms positively. A high level of participation of CFA members in forest patrol, fire control, tree nursery activities, and tree planting was associated with training and high PFM benefit perception. It is important for the government to provide adequate training on all forest conservation and management issues to all CFA members in order to increase their level of participation in all PFM activities. According to Macharia (2008) the government should utilize conservation activities as a way of creating income generating activities for youth in the communities to enable them eke a living from the projects.

According to Brosius (2005), there are also moral reasons why communities should be allowed to manage their forests, especially since many depend on natural resources for basic survival and livelihoods. People should rightly have control over their own destinies and this translates into secure land tenure with a reasonably long-term agreement, (Pierce Colfer & Byron, 2001). Longer-term security of land ownership and legally recognized rights and responsibilities not only creates incentives to manage resources more sustainably but also has implications for the health of local people and cultures. Having some control over the direction and pace of change is important to the mental health of all peoples. This sentiment is echoed by Amartya Sen (1999) who argues eloquently that human well-being is about far more than making enough money; it must include personal liberty and one's ability to control one's own destiny.

Community management of forest resources allows for the continuation of cultural diversity as well as biodiversity. This is not to say that cultures should not be allowed to evolve but the current context for forest-based peoples and their cultures seems unnaturally antagonistic to local systems, based largely on the extreme inequities in power between forest-based peoples and the groups typically "invading" their areas. According to Pierce Colfer (2005) this results in an acceleration of loss of cultures. Illegal logging and poaching have been reduced to very low rates since community members started patrolling the forest to protect it from illegal clearing. Community forestry and Forestry Administration signs and logos located throughout the forest make it clear that Osoam community has ownership rights over the forest and the resources within it(Ma, 2014).Project proponents believe that, along with forests in protected areas, community forests will be the last largely intact forests left standing in Cambodia, like islands amid a deforested landscape. Community members felt that outsiders would eventually invade their forest, putting further pressure on the forest and the need to protect it (Clements et al., 2010).

2.4.5. Community Project Implementation

Community forestry sites occur in specific settings in the landscape and support specific plant and wildlife communities, with successes and failures largely determined by local ecological, social and economic conditions. Even so, three crucial factors stand out for the roles of community participation in successful community forestry: well-defined property rights, effective institutional arrangements, and community interests and incentives (Pagdee, Kim & Daugherty, 2006). Without these elements, it will be very difficult to secure the survival of natural forests and the wellbeing of forest-dependent communities.

In Cambodia, weak institutions and poor governance are at the root of widespread land disputes. Even land allocated for community forestry is not safe from land-grabbing and commercial exploitation. Ineffective environmental law enforcement makes it almost impossible for community forestry groups to assert their rights of ownership especially against powerful, self-interested adversaries. This emphasizes the need to support sustainable forest management through instituting clearly defined property rights and building the capacity of local institutions (Clements, Ashish, Karen, Dan, Setha & Milner-Gulland, 2010) so as to strengthen enforcement and compliance unit for proper law enforcement.

In addition, monitoring and evaluation of community forestry activities is required to find out what has worked and what has not (Sokh & Iida, 2001). However, as the case study of Osoam community forestry reveals, the critical issues of insecure land tenure, disorganized local institutions and insufficient technical and financial support risk undermining the overall aim of achieving sustainable forest management and poverty reduction. Community forestry development clearly needs much more policy attention and continuous financial and technical support if it is to make any marked contribution to poverty reduction and biodiversity conservation (de Lopez, 2004). There is need to actively involve the communities in the decision-making processes from policy formulation through to implementation and even during evaluation. In the developing countries that were identified in this paper, the communities were only involved in the implementation of the programs. This led to deliberate negligence of the programs by the local communities and ultimately failure.

Policies which do not involve community participation in formulation through planning and budgeting do not guarantee the sustainability of programs, projects and activities. It is not enough to label a project "community based" while not actively involving the communities in all stages of the project. The communities are the ones closest to the resources and should not be treated as passive recipients of technocratic and bureaucratic solutions from the top. The top-down approach that was previously the only method applied in programme establishment is now combined with the bottom-up approach (Suharti, 2001). The costs of participatory natural resource management included time consumed in attending meetings, limited access to resources such as grazing land, water sources, game meat and agricultural land. There are also hazards involved in the participatory management for example in firefighting. It becomes imperative to involve the major groups in program, project and activity initiation outlining all factors involved to facilitate commitment to the exercise.

In addition, if equitable sharing of benefits within communities is to be achieved it is of central importance to understand how benefit distribution is dictated by community conditions including varying interests, capacities, responsibilities, and relationships between individuals and groups (Mahanty et al., 2007). Borrini-Feyerabend et al. (2007) state that most communities show internal inequalities and differences, based on ethnic origin, class, caste, economic endowments, religion, social status, gender and age. Agrawal (2001) argues that gender-related differences are especially significant within groups because of the often "critical role women play in the gathering and harvesting of products from common-pool resources, the simultaneous position of relative marginality to which they are relegated in terms of decision making, ownership of assets, and exercising political power". What then does the heterogeneous nature of communities mean for benefit sharing at the local level? In all societies, the composition of decision-making bodies is likely to reflect and reinforce imbalances of power, with the weaker and underprivileged social groups being least.

An often overlooked but important component to community development is monitoring and evaluation. An M&E system can provide a regular flow of information on the performance of policies (World Bank, 2011). Monitoring is the periodic oversight of the implementation of an activity which seeks to establish the extent to which input deliveries, work schedules, other required actions and targeted outputs are proceeding according to plan, so that timely action can be taken to correct deficiencies detected. "Monitoring" is also useful for the systematic checking on a condition or set of conditions, such as following the situation of projects. Monitoring can also be said to be a management function which uses a methodical collection of data to determine whether the material and financial resources are sufficient, whether the people in charge have the necessary technical and personal qualifications, whether activities conform to work plans, and whether the work plan has been achieved and had produced the original objectives. Monitoring is an ongoing process of data capture and analysis's for primarily project control with an internally driven emphasis on efficiency of project (Crawford & Bryce, 2003).

Evaluation is the episodic (not continuous as the case with monitoring usually mid- term and at end of the project) assessment of an on-going or completed project to determine its actual impact against the planned impact (strategic goal or objectives for which it was implemented) efficiency, sustainability, effectiveness (McCoy *et al.,* 2005). At least two types of accomplishments can be measured: outputs – the direct and short-term results of a project or plan such as the number of people trained, the number of affordable houses built, or the number of jobs created; and outcomes – the long-term results of a project or plan. Ongoing project evaluation is viewed as a valuable tool to promote sustainability. In addition to achieving alignment of the project's characteristics with the needs of its stake holders (Johnson et al., 2004; Weiss *et al.,* 2002) argued that project evaluation can help in the development of strategies for sustainability, to follow up their implementation, and to evaluate their effectiveness. Similarly, evaluation can be useful in identifying problems in the project and in facilitating flexibility. To mobilize resources required to sustain the project beyond its initial grant, it is not enough that the project attains its objectives. The project must be able to document its success and disseminate the evidence among stakeholders (Mancini & Marek, 2004; Steadman *et al.,* 2002). Some studies show that advertisement of the project's effectiveness not only to its stakeholders but also to the general public serves as a meaningful predictor of the sustainability of the project (Stephen *et al.,* 2005) in that it enhances community support in sustainability of indigenous forests.

2.5. Conceptual Framework

A conceptual framework is a set of broad ideas and principles taken from relevant fields of enquiry and used to structure a subsequent presentation (Biklen 2003). It is a written or visual presentation that: "Explains either graphically, or in narrative form, the main things to be studied – the key factors, concepts or variables and the presumed relationship among them". In conducting the study, a conceptual framework will be developed to show the relationship between the

independent variables and dependent variable. The constructs and relationships between research variables are illustrated in Figure 1.
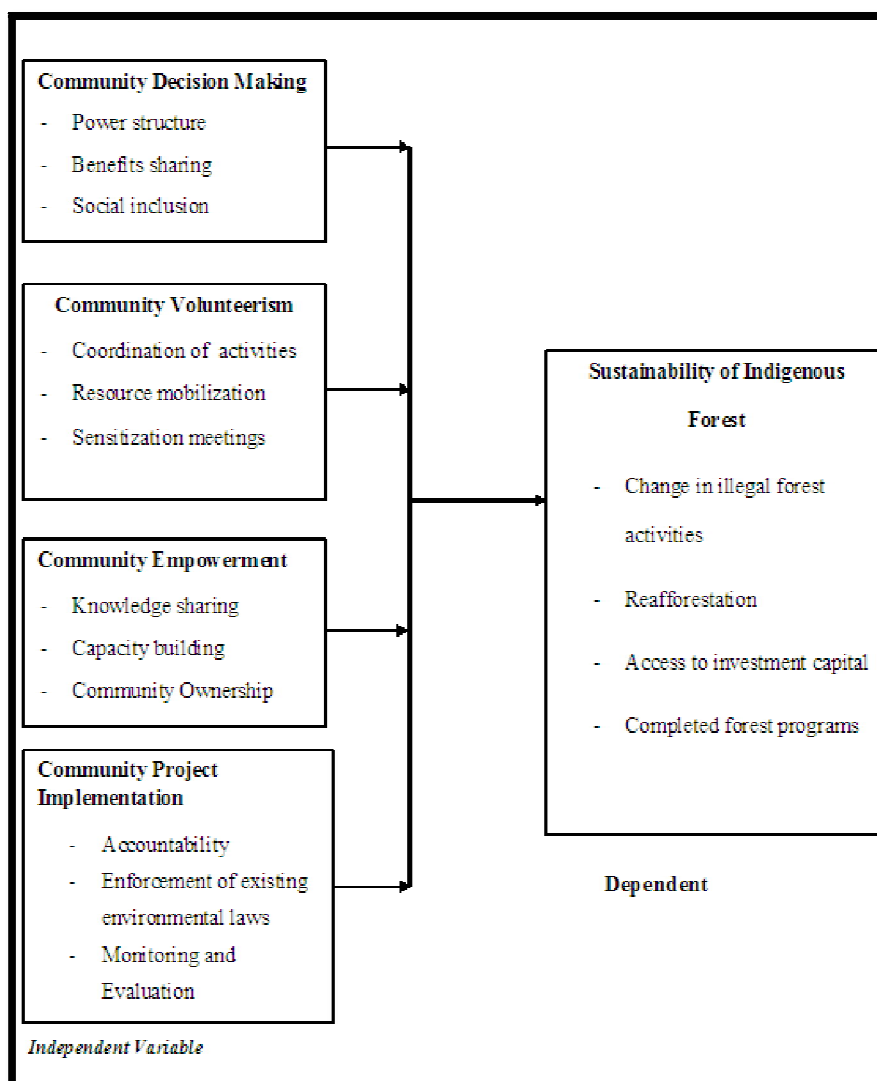

Figure 1: Conceptual Framework

2.5. Empirical Review

This section reviews studies previously done on sustainability of forest covers. According to Zikmund (2010) empirical literature review is a directed search of published work which includes books and periodicals. It is a comprehensive survey of previous inquiries related to the research questions.

Rhyne (2012) states that through the use of a systematic approach to previous scholarly work, literature review allows a researcher to place her research work into an intellectual and historical context by enabling the researcher to declare why her research matters. A study by Holder and Chase (2011) reexamined the sustainability of a municipal-communal pine forest in San Jose' La Arada, a municipality in eastern Guatemala for eleven years from 1996 to 2007. A household survey was conducted and thirty households in each village were randomly selected to ensure equity. The study found that the influence of remittances and the decentralization of communal-municipal forest management explain the recent trend of forest improvement within the pine forest of San Jose' La Arada. The economic and social changes associated with remittances and globalization of the workforce, was a catalyst for driving the reversal in decline of the San Jose' La Arada forest from 1996to forest sustainability.

A study by Claridge (2004) on designing social capital sensitive participation methodologies discussed the evolution of participation theory. The theory represents a move from the global, a spatial and top down strategy that dominated early development initiatives to more local sensitive methodologies. According to Claridge, Kelly (2001) provided a good account on evolutionary trends in participation from the 1960s however does not identify the influence of community development. The study found that by providing opportunities for repeat interaction in the participatory methodologies, social capital benefits could be maximized.

A study by Eshun (2008) on community participation in the management of forest resource: A means to reduce poverty for sustainable development, the case of Kakun National Park. The concept of sustainability is inevitable as far as the forest resource management is concerned and there is need to understand the concept and use the forest to suit its

purpose. Eshun in her study argues that the dilemma of procedure which could be used to produce the political will for painful, yet essential, transformation to others is necessary.

Ogada (2012) in his study investigated the factors that influence participation of households in devolved system of forest management by joining community forest associations. Using propensity Score Matching to examine the direct effect of CFA membership on acreage under tree cultivation and cross-sectional data from a survey of farm households adjacent to Kakamega forest, the analysis considered a casual relationship between participation in CFA and household area under trees. This implied that decentralized forest management is a viable approach towards increasing forest cover in the country.

A research by Ming'ate, Letema and Obiero (2016) on designing a functioning community forest association: A case of Muileshi, Kakamega County, Kenya examined the Muileshi CFA structure, its membership, CFA agreement, constitution, responsibilities in management of the forest, challenges facing the CFA and its achievements using utilized documents and a focus group discussion with Muileshi CFA. Using Common Property resource theory approach the study confirmed that a well-designed community forest association can contribute significantly to the conservation of a community-based forest as well as deliver livelihoods adjacent to those forests.

Freeman, Horisch and Schaltegger (2014) on Applying Stakeholder theory in sustainability management: links, similarities, and a conceptual framework, organization environment. The theory makes companies to take social responsibilities and presents fairness and trust to everyone involved in business thus companies gain more loyalty from stakeholders, efficiency is promoted and as a result stakeholders' interests are enhanced.

A study by Suharti (2001) on increased community forest participation in forest management through development of social forestry programmes in Indonesia examined different social forestry programme development by gathering information from several research studies and literature. The study realized a dynamic in social forestry development from time to time and that community participation has an important role in determining the success of sustainable forest management.

2.6. Critique of the Existing Literature

A research on the role of remittances and decentralization of forest management in the sustainability of a municipal-communal pine forest in eastern Guatemala by Holder and Chase (2011) showed that remittances and decentralization of communal-municipal forest management influenced the trend of forest improvement within the pine forest however result for one exotic tree species cannot be used to generalize all native tree species in the forest.

Ming'ate, Letema and Obiero (2016) did a research on designing a functioning Community forest association: A case of Muileshi, Kakamega County, Kenya where exploratory research design was used in the research which confirmed the hypothesis. It has been hypothesized that a well-designed CFA with functioning institutional arrangements will conserve community forests and deliver significant livelihoods to poor forest dependent communities and it assumed Muileshi CFA is well designed and operating effectively. However, exploratory research design cannot be used to generalize all community-based forest groups instead other research designs like descriptive research can be applied.

2.7. Research Gap

A research on the role of remittances and decentralization of forest management in the sustainability of a municipal-communal pine forest in eastern Guatemala by Holder and Chase (2011) found that remittances and decentralization of forest governance had a positive influence towards forest sustainability in San Jose' La Arada. However, the study recommended further study in a different environment to demonstrate whether the trend in San Jose' La Arada is a regional trend. The Study used biological diversity and productive capacity as criteria of sustainability creating a baseline for other studies using different criteria.

Guthiga and Mburu (2006) did a research on Local communities' incentives for forest conservation: case of Kakamega forest in Kenya. The result indicated that the local communities enjoy substantial economic benefits from Kakamega forest and the study recommended further research to understand in depth the actual level of forest exploitation vis a vis the corresponding regeneration so that a good balance is maintained between the two processes. This study will therefore add value to the existing literature which may be used as a guide to the development of the forest policy thus benefiting the country together with its citizens.

2.8. Summary

This chapter reviewed literature relevant to the role of community participation in sustainability of indigenous forests in Kakamega East Sub County. It also outlined the conceptual framework which showed the relationship between independent and dependent variables. The chapter further explains the empirical studies relating to the independent variable thus leading to critique of the existing literature and finally the research gap.

3. Research Methodology

3.1. Introduction

This chapter discussed the methodological approach for the study and it comprised the research design, target population, sampling design, research instruments, data collection procedure and data analysis techniques and presentation.

3.2. Research Design

A research design is the specification of methods and procedures for acquiring the information needed (Green & Tull, 2009). It is the over-all operational pattern or framework of the project that stipulates what information is to be collected from which source by what procedures. Research design is important as it prepares proper framework within which the research activity was actually carried out. The study employed descriptive research survey design since it involves gathering data that describes the nature and characteristics of the role of community participation in sustainability of indigenous forests in Kakamega East Sub-County, Kenya. Descriptive studies often employ the survey strategy (Easterby-Smith, Thorpe, & Lowe, 2002).

According to Sekaran and Bougie (2010), descriptive survey design enables one to capture all pertinent aspects of a situation while employing a unit study and investigation. This is in line with this study purpose. Survey research was important as it is very useful for documenting an individual's perception and perceived experiences of an organization's work culture, service delivery or other areas of interest. Moreover, this design gave the study the advantage of collecting original data for the purpose of describing a population which is large to observe directly hence good for the purpose of generalization (Cohen, Manion, & Morrison, 2007).

3.3. Target Population

Population is the entire set of units for which the study data were used to make inferences (Kothari, 2003). A population is a group of individual persons, objects, or items from which samples are taken for measurement. It is the total collection of elements about which the researcher wishes to make some inferences (Cooper & Schindler, 2006). The study focused on house-level data collection in Virhembe sub location in Kakamega East Sub County. According to Kenya National Bureau of Statistics (2010), the area has a population of 2058 households. The survey questions were asked to only one youth of every household. The area was chosen because it borders the forest and has registered many community forest groups which makes it fit for the study.

3.4. Sampling Frame

Sampling frame also known as a source list (Kothari, 2004), is a source material or device from which a sample is drawn. Copper (2011) refers to a sampling frame as a source list containing all names of the universe. A list of all 2058 Households in Virhembe Sub location will form my Sampling frame.

3.5. Sample Size and Sampling Technique

A sample is finite part of a statistical population where properties are studied to gain information about the whole (Bluman, 2009). Kothari (2014) describes a sample as a collection of units chosen from the universe to represent it. Elaborate formulae have been developed to help researchers estimate the most realistic sample sizes for their studies.
To get information about population of interest and draw inferences about it, a sample which is a subgroup of the population is used. Sample size depends on the nature of the analysis to be performed, the desired precision of the estimates one wishes to achieve, the kind and number of comparisons that will be made, the number of variables that have to be examined simultaneously and how heterogeneous a universe is sampled. According to (Mugenda & Mugenda, 2003) a descriptive study should take at least ten percent (10%) of the accessible population and it should be enough to a specific study. For that reason, this study adopted a sample size of 10% of the population resulting to a total of 205 respondents. The households were selected using a simple random sampling technique where every member had an equal chance of being selected. This is rather a statistical method of selecting the sample units to offer the requisite estimate for our study.

3.6. Data Collection Instruments

This refers to the tools to be used for collecting data and how these tools were developed. In researching human beings, no single source of information can be trusted to provide a comprehensive perspective in any study program. The data collection instrument that was used to collect data from the selected respondents in Closed and open-ended structured interview questionnaires. A questionnaire is a list of logically framed questions that each respondent in a survey answers in writing or by making answers on an answer sheet (Franken & Wallen, 2010). Open ended questions provide respondents with a chance to express their own personal opinion beyond the researcher's span of knowledge (Abdalla, 2014). Interviews were used to collect data from Key informants. The use of a combination of data sources and collection methods are a validating aspect which cross-checks data since the strength of one approach compensates for weaknesses of another approach (Schofield, 1996; Cohen, Manion & Morrison, 2000).

3.7. Pilot Study

A pilot study is a small study conducted in advance of a planned project in order to evaluate feasibility, time, cost, adverse events, and effect size in an attempt to predict an appropriate sample size and improve upon the study design prior to performance of a full research project. It was important in shaping administration of research instruments. According to Kothari (2004), pilot study revealed deficiencies in the design of proposed research instruments.

A pilot study was done to determine the reliability of the instruments. It employed Cronbach's alpha coefficient to measure the internal consistency of the questionnaire. As a general rule a value of $\alpha > 0.7$ was used to determine the reliability for each of data sets where α is the item being tested for reliability (Kothari, 2010). Pre-testing the questionnaire was done in Malava Sub County using a sample of 10% of the sampled population. This helped to reveal vague questions, deficiency in questions and tested if the research instruments were capable of collecting data required for the study.

3.7.1. Reliability of the Research Instrument

Reliability is the consistency of the research instrument. Mugenda and Mugenda (2009) observe that reliability is a measure of degree to which a research yields consistent results after repeated trials. To ensure reliability of the research instruments, this study used the internal consistency approach to ensure reliability. It used Cronbach's alpha coefficient to measure the internal consistency of the questionnaire. As a general rule a value of alpha greater than 0.7 was used to determine the reliability for each of data sets where alpha was the item being tested for reliability.

3.7.2. Validity of Data

Validity is the degree to which results obtained from the analysis of the data represents the phenomenon under study (Mugenda & Mugenda, 2003). The researcher validated the content of the research instrument through administration on the pilot group and the study's content validity was scrutinized by the research supervisor and modified to fit the objectives.

3.8. Data Collection Procedures

This section includes overview of the procedures for specific tasks that generated data items. Data was collected through structured questionnaires. (Schwab, 2005) defined a questionnaire as a measuring tool that asks individuals or their respondents to answer questions to a set of statements. The research assistants were trained to understand the data collection instruments in order to assist in collecting data. After being cleared by the university supervisor, the researcher proceeded to the field and sought permission from the administrative unit in the sub location and the manager of Kenya Forest Service to collect data in their location. Thereafter questionnaires were administered by the researcher with the help of assistants to respondents for them to fill and return for analysis. The research assistants were trained not to elaborate on questions asked but to repeat exact text and ask the respondent for his or her best response in order to ensure accurate and honest data collection for analysis.

3.9. Data Processing and Analysis

Data analysis is a process of inspecting, cleansing, transforming, and modeling data with the goal of discovering useful information, suggesting conclusions and supporting decision making. Zikmund defined data analysis in 2010 as: the application of reasoning to understand the data that has been gathered with the aim of determining consistent patterns and summarizing the relevant details revealed in the investigation. To discover useful information data collected is analyzed using specified techniques guided by the objectives of the research.

After data collection, data collected was sorted, coded and checked for consistency in order to eliminate misleading information which could arise from misinterpretation of the questions. Data was analyzed using both qualitative and quantitative methods. Statistical Package for Social Science (SPSS) facilitated easy processing and analysis of all the quantitative and qualitative responses obtained from the study tools. Descriptive statistics was used to determine mean, frequencies and percentages since it has the advantage of easy presentation of finding in form of graphs and tables if need be (Triola, (2008).

Correlation analysis which involved examining relationships between two sets of intervals or ratio level variables was used to test the relationship of independent and dependent variables using Pearson Product Moment Correlation or Spearman rank Order Correlation. Regression model was used to test the significance of the influence of the independent variables and dependent variable under inferential statistics. The following regression formula was used: **$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$.**

Where: Y = Sustainability of Indigenous Forests;
X_1 = Community Decision Making;
X_2 = Community Volunteerism;
X_3 = Community Empowerment;
X_4 = Project Implementation;
e = error term or an unobserved random variable
β_0 = an unknown population parameter, known as the constant or intercept term
$\beta_1 \beta_2 \beta_3 \beta_4$ = an unknown population parameter, known as the coefficient or slope

3.9.1. Regression assumptions

- There is a linear relationship. That is, there is a straight-line relationship between the dependent variable and the set of independent variables.
- The variation in the variables is the same for both large and small values.
- The variables follow the normal probability distribution.
- The independent variables should not be correlated.
- The variables are independent.

4. Research Results and Discussion

4.1. Introduction

In this chapter, raw data from the questionnaires was analyzed and interpreted. Various tests were used to test the relationship between variables, level of significance, reliability and random distribution of data. Specifically,

descriptive statistics, ANOVA and Multiple Regression analysis were used. The independent variables of the study were community decision making, volunteerism, community empowerment and community project implementation and how they influenced the dependent variable which was sustainability of indigenous forests in Kakamega East Sub-county.

4.2. Response Return Rate

Out of 205 questionnaires dispatched, 156 were duly filled and returned giving a response return rate of 76.1%. This response rate was considered sufficient to make inferences for this study. Mugenda and Mugenda (2003) asserted that a 50% response rate is adequate, 60% is good while 70% questionnaire return rate was rated very good. This implies that based on this criterion, the response rate of 76.1% was therefore very ideal. The current study achieved a high response rate but failure of 23.9% questionnaire return rate could be due to insensitivity of the respondents to research study and psychological problems. They could also be not interested in conservation activities.

4.3. Reliability Test

Cronbach's alpha was used to determine the internal reliability of the questionnaire used in this study. Values range between 0 and 1.0; while 1.0 indicates perfect reliability, the value 0.70 was set to be the lower level of acceptability. The reliability statistic for each of the variable is presented in Table 1.

Variable	Cronbach's Alpha Correlation	Decision
Community Decision Making	0.829	Accepted
Community Volunteerism	0.778	Accepted
Community Empowerment	0.792	Accepted
Project Implementation	0.784	Accepted

Table 1: Cronbach's Correlation

It is evident from Table 1 that Cronbach's alpha coefficients for each of the variables was well above the lower limit of acceptability (0.70). The results indicate that Community decision making had a coefficient of 0.829, Community volunteerism had a coefficient of 0.778, Community empowerment had a coefficient of 0.792, Project implementation had a coefficient of 0.784 and value addition obtained a coefficient of 0.796. The results indicate that the questionnaire used in this study had a high level of reliability.

4.4. Descriptive Statistics

This section outlines the demographic data, gender, marital status, years of existence and key players in the industry

4.4.1. Demographic Information of the Respondents

The demographic features of the respondents were of interest to the study as they provide the study with a base for in-depth information on demographic factors which affect the respondents' social and economic behavior.

4.4.2. Gender of the Respondents

The respondents were required to give their gender; this was to establish gender sensitivity and balance in community development. Findings are shown in Table 2

Gender	Frequency	Percent	Valid %	Cumulative %
Male	99	63.5	63.5	63.5
Female	57	36.5	36.5	100.0
Total	156	100.0	100.0	

Table 2: Gender of the Respondents

Result in Table 2 shows that 99 (63.5%) of the respondents were male and 57 (36.5%) were female. The result indicates that more men participated in sustainability of indigenous forests than females in Kakamega East Sub-County. This implies community participation in development programmes do not take gender issues into account, they become gender insensitive or gender blind in as much as they fail to recognize the different needs of women in the community. Cultural practices and traditional gender roles may make this aspect of sustainability of indigenous forests challenging; however, such an approach of women inclusion and empowerment could substantially improve the outcomes of conservation and development actions.

These findings are supported by Agarwal (2009) who asserted that women play critical roles in natural resource use, information transfer, and societal reinforcement of resource use practices. There is a need to ensure that they are as well integrated into community-based conservation projects as men at all levels, from micro-development projects to management and power structures. Agrawal (2001) asserted that gender-related differences are especially significant within groups because of the often "critical role women play in the gathering and harvesting of products from common-pool resources, the simultaneous position of relative marginality to which they are relegated in terms of decision making, ownership of assets, and exercising political power". In any society, the composition of decision-making bodies within the

power structure is likely to reflect and reinforce development; with the weaker and underprivileged social groups being least engaged. Therefore, participation by gender is considered as the main factor in assessing sustainability of community projects.

Furthermore, a study by Pandolfelli, Meinzen-Dick and Dohrn (2007) also attributed to gender roles reporting that men and women have different opportunities, motivation and capabilities to involve themselves in collective action. Community participation demands change in attitude of its members towards women in a patriarchal society. While community members have come forward to embrace the 30% affirmative action towards women participating in development projects including forest projects, the household heads have to switch their ways from control to involvement of its members in decision making for its project sustainability.

4.4.3. Age of the Respondents

The study sought to establish the age distribution of respondents. This is a demographic feature that tends to influence behavior or perception of the respondents. Findings are shown in Table 3

Respondents' Age	Frequency	Percent	Valid %	Cumulative %
18-22 years	38	24.4	24.4	24.4
23-27 years	75	48.1	48.1	72.5
28-32 years	24	15.4	15.4	87.9
> 32 years	19	12.1	12.1	100.0
Total	156	100.0	100.0	

Table 3: Age of the Respondents

Findings in Table 3 show that 38 (24.4%) of the respondents were ranged between 18-22 years, 75 (48.1%) ranged between 23-27 years, 24 (15.4%) ranged between 28-32 years and 19 (12.1%) were over 32 years. The mass composition of respondents was 75 (48.1%) ranging between 23 – 27 years. This age bracket represents youths who have completed school and colleges and are yet to establish their ways of generating income to sustain their livelihood thus idling in their parents' homes. This finding is supported by (GoK, Kakamega Forest Strategic Ecosystem Management Plan 2015-2040, 2015) who assert that; youths in surrounding communities are mostly unemployed, thereby eking their livelihood illegally from forest. The lowest representation was higher age range over 32 years at 19 (12.1%) responses.

4.4.4. Respondents Marital Status

The study sought to determine marital status of the respondents and findings are illustrated in Table 4.4

Marital Status	Frequency	Percent	Valid %	Cumulative %
Single	67	42.9	42.9	42.9
Married	77	49.4	49.4	92.3
Widow	12	7.7	7.7	100.0
Total	156	100.0	100.0	

Table 4: Respondents' Marital Status

Findings in Table 4 show that 67 (42.9%) of the respondents were single, 77 (49.4%) were married couples and 12 (7.7%) were widow/widower. Majority 77 (49.4%) of the youths were married. This has forced them to find ways of sustaining their young families thus joining the Community Forest Association to participate in sustainability of indigenous forest and eke a living without destroying the forest.

4.4.5. Length of Service of the Respondents

The research sought to establish the number of years the respondents had worked since this could indicate the exposure and experience; they possess in sustainability of indigenous forests. Results are shown in Table 5

Length of Service	Frequency	Percent	Valid %	Cumulative %
0-3 years	65	41.7	41.7	41.7
4-6 years	34	21.8	21.8	63.5
7-9 years	32	20.5	20.5	84.0
> 10 years	25	16.0	16.0	100.0
Total	156	100.0	100.0	

Table 5: Respondents' Length of Service

Results in Table 5 show that 65 (41.7%) of the respondents had worked for 0-3 years, 34 (21.8%) had worked between 4-6 years, 32 (20.5%) had worked between 7-9 years while 25 (16.0%) having worked for over 10 years. Most of the respondents had worked between 0-3 and (41.7%) responses. Therefore, work experience in communities around the forest has a direct link in sustainability and management of natural resources.

4.4.6. Academic Qualifications of the Respondents

The study sought to establish the highest academic qualifications of the respondents in order to relate skills in sustainability of indigenous forests in Kakamega East Sub County. The results are illustrated in Table 6.

Academic Qualifications	Frequency	Percent	Valid %	Cumulative %
Primary	48	30.8	30.8	30.8
Secondary	56	35.9	35.9	66.7
Diploma	37	23.7	23.7	90.4
Degree	12	7.7	7.7	98.1
Master's	3	1.9	1.9	100.0
Total	156	100.0	100.0	

Table 6: Respondents' Academic Qualification

Results in Table 6 shows that majority 56 (35.9%) of the respondents had secondary education while 48 (30.8%) had primary education. Another 37 (23.7%) possessed diploma education and 12 (7.7%) of the respondents were degree holders. It should be noted that only 3 (1.9%) of the respondents was master's holder who participated in this study.

4.5. Community Decision Making and Sustainability of Indigenous Forests

Participation should contain elements of initiative and decisions, emanating from the community itself. The current study sought to determine the influence of community decision making in sustainability of indigenous forests in Kakamega East Sub-County. To answer this objective, a five-point scale of SD (Strongly Disagree), D (Disagree), U (Undecided), A (Agree) and SA (Strongly Agree) was used.

Statements	SD		D		U		A		SA			
	F	%	F	%	F	%	F	%	F	%	M	SD
Power distribution affects youth participation	6	3.8	9	5.8	3	1.9	56	35.9	82	52.6	4.27	1.025
I frequently participate in decision making process	0	0.0	27	17.3	2	1.3	73	46.8	54	34.6	3.98	1.028
I have authority to engage in forest activities	0	0.0	49	31.4	71	45.5	33	21.2	3	1.9	2.93	.776
My group has a participatory forest management plan	12	7.7	14	9.0	53	34.0	69	44.2	8	5.1	3.30	.979
There is Fair & equitable distribution of benefits	6	3.8	29	18.6	0	0.0	21	13.5	100	64.1	4.15	1.310
All members are involved in sharing benefits	2	1.3	23	14.7	50	32.1	79	50.6	2	1.3	3.35	.794
Local knowledge is useful towards forest sustainability	0	0.0	10	6.4	0	0.0	131	84.0	15	9.6	3.96	.594
I am involved at all levels of decision making	10	6.4	50	32.1	1	0.6	77	49.4	18	11.5	3.27	1.210
There is inadequate gender mainstreaming policy	1	1.6	10	6.4	8	5.1	11	7.1	126	80.8	4.60	.898
I am willing to participate in the management of forest	11	7.1	21	13.5	43	27.5	50	32.1	31	19.8	3.48	1.104
Valid N (listwise)	156											

Table 7 : Descriptive Statistics on Community Decision Making

It is shown in Table 7 that majority 82 (52.6%) of the youths who participated in this study strongly agreed that the power distribution affects youth participation in forests development projects hence sustainability with a mean of 4.27. This implies that decision making is important in achieving organizational goals/objectives within given time and budget. It devolves the decision-making power to the community and the members of the community benefit directly from the forest management. Another 73 (46.8%) stated that by frequently participating in decision making process, sustainability is achieved at a mean of 3.98. However, 71 (45.5%) of the youths were undecided whether they had authority to engage in forest activities at a mean of 2.93. Perhaps this is due to the fact that they have not been given full power management and sustainability of indigenous forest. This consequently reduces people's attachment value to forest ecosystems and the need to protect them; which in turn results in their desire to decline in change in illegal activities and decreased forest cover on their farms. This results points at the influence of power in decision making hence the choices we make always affect someone. Regardless of the degree, someone is always affected by the choices of others. Therefore, power structure is a critical element of decision-making process in any development agenda and it also limits illegal activities. Decision is effective or ineffective with reference to the ability of the group to initiate changes in these relationships or to compensate for changes of exogenous origin. These relationships develop in a dynamic setting

characterized by changes in one or more of the elements of decision. These findings confirm that participation must contain elements of initiative and decision, emanating from the community itself (Suharti, 2001). From the Process Approach: People Centered Development by David Korten (1980), managing forests sustainably is critical not only to balance competing uses in the short term but to ensure we can enjoy forest benefits for generations to come. Participation in forest management groups has been also shown to influence decisions to plant more trees on-farm (Emtage & Suh, 2004) and participate in forestry projects. Therefore, this study proposes that acquisitions approaches in decision making process in local community participation in are sufficient elements of indigenous forest sustainability.

Findings further reveals that 69 (44.2%) of the respondents stated that their groups have a participatory forest management plan at a mean 3.30. In principle, community forest management plan creates a source of stable income by providing incentives for local communities to keep their land forested, thus conserving biodiversity and ecosystem services and contributing to poverty reduction and economic development (Anderson, 2011). In addition, 100 (64.1%) of the youths strongly agreed that there is fair and equitable distribution of forest benefits at a mean of 4.15. This implies that fair and equitable distribution of resources motivates youth participation in forest conservation and reforestation. This aspect ultimately brings the public into the decision-making process to create consensus, own and support the forestry programs. This is in with previous studies that reported individuals have greater motivation to pursue sustainable environmental practices when resources are locally owned. Therefore, fairness is an important component of sustainable forest management especially in sharing of benefits and costs of forest use (Kiefaber, Gass, & Rickenbach, 2009). Eshun (2008) indicated that it is expected that as one owns a resource, he gains some benefit from it. Majority 131 (84.0%) of the respondents also asserted that local knowledge is useful towards forest sustainability at a mean of 3.96. This result implies that distribution of forest benefits within the community influence sustainability. Thus, this affects the participation of local people in forest by limiting illegal activities hence sustainability. Macharia (2015) asserted that participatory processes through indigenous knowledge sharing increases the likelihood of success as it provide opportunities for community members to participate, receive feedback and jointly develop new ideas over a period of time thus sustainability. Similar findings were also reported by KoKu (2002) that the local farmers' knowledge must be the key element of efforts to motivate plantation of trees on farms since local people and scientists may not necessarily share the same view. Therefore, it is important to understand what the local farmers know and how it affects on their decision on conducting farming activities and forest development projects. This is also in line with Osumba (2011) who indicated the government's recognition of the critical role that can be played by the local adjacent communities in ensuring that the tree cover in the country increase to the internationally recommended 10%.

It is worth to note that majority 77 (49.4%) of the respondents stated that they are involved at all levels of decision making towards forest programmes at a mean of 3.27. However, 126 (80.8%) of the youths asserted that there was lack of gender mainstreaming policy towards forest activities at a mean of 4.60. This implies that lack of gender mainstreaming makes public interventions less effective and ensures that inequalities are perpetuated among men and women. Gender mainstreaming helps communities to identify gender gaps among professionals and the role of women in decision-making at both local and national levels in environmental management. It also ensures that policy-making and legislative work is of higher quality and has a greater relevance for society, because it makes policies respond more effectively to the needs of all citizens. This result indicates that gender issues and roles are important in fostering networks for collective action in forest conservation management. Such networks, built through trust and gender balance determine the ability of a group to solve problems successfully. This ultimately improves decision making capability of all members of the community including women and people living with disabilities. Earlier studies have reported have also reported a great challenge in modern forestry to manage a forest for multiple goals including biodiversity conservation (Trotter & Whitham, 2011). It has the co-benefits of reducing poverty, addressing social exclusion, and creating rural employment (Moss, 2012) and carbon sequestration (Gautam & Watanabe, 2009). Furthermore, only 50 (32.1%) of the youths reported their willingness to participate in the management of forest. This implies that many youths are reluctant to participate in conservation activities other than seeking white collar jobs in other sectors of the economy.

Therefore, social inclusion in decision making process takes all categories of individuals hence more realization of high levels of sustainability in management of indigenous forests. It involves the integration of a gender perspective into the preparation, design, implementation, monitoring and evaluation of policies, regulatory measures and spending programmes, with a view to promoting equality between women and men, and combating discrimination. These findings are similar to those by Holder and Chase (2011) who reported that local communities have long been excluded by the central government from participation in forest policy. Participation by gender is considered a main factor in assessing sustainability. Men and women have different opportunities, motivation and capabilities to involve themselves in collective action (Pandolfelli, Meinzen-Dick, &Dohrn, 2007). Community participation demands change in attitude of its members towards women in a patriarchal society. While community members have come forward to embrace the 30% affirmative action towards women participating in development projects including forest projects, the household heads have to switch their ways from control to involvement of its members in decision making for its project sustainability communities.

4.6. Community Volunteerism in Sustainability of Indigenous Forests

The current study examined the role of community volunteerism in promoting sustainability of indigenous forests in Kakamega East Sub-County.

Statements	SD		D		U		A		SA			
	F	%	F	%	F	%	F	%	F	%	M	SD
Volunteering services affects projects sustainability	9	5.8	21	13.5	1	0.6	87	55.8	38	24.4	3.79	1.128
Lack of coordination of projects activities	0	0.0	31	19.9	5	3.2	64	41.0	56	35.9	3.92	1.090
There is poor coordination of forest volunteers	10	6.4	50	32.1	1	0.6	77	49.4	18	11.5	3.27	1.210
Participation in forestry projects is time consuming	1	0.6	13	8.3	0	0.0	69	44.2	73	46.8	4.28	.885
Agreements on costs are based on a win-win situation	25	16.0	57	36.5	1	0.6	20	12.8	41	34.1	2.67	1.767
Any form of payment permitted in my group	13	8.3	87	55.8	15	9.6	39	25.0	2	1.3	3.12	1.579
I am willing to incur costs to sustain Kakamega forest	10	6.4	51	32.7	0	0.0	30	19.2	65	41.7	3.57	1.459
Sensitization meetings usually affects sustainability	3	1.9	32	20.5	1	0.6	71	45.3	49	31.4	3.83	1.138
Lack of transparency in sensitization meetings	0	0.0	16	10.3	0	0.0	106	67.9	34	21.8	4.01	.795
Engaging youths at all times affect forest sustainability	18	11.5	11	7.1	10	6.4	100	64.1	17	10.9	3.55	1.950
Valid N (listwise)	156											

Table 8: Descriptive Statistics on Community Volunteerism

As presented in Table 8, 87 (55.8%) of the respondents stated that volunteering their services towards forest projects affects its sustainability at a mean of 3.79, though 64 (41.0%) indicated that forestry projects fail due to lack of coordination of activities hence some people participate in illegal activities at a mean of 3.92. The study also revealed that 77 (49.4%) of the youths asserted that poor coordination of forest volunteers affects forest sustainability at a mean of 3.27. This indicates that forest activities require proper coordination in order to achieve optimum participation. This ultimately does not create people's genuine interests in the forestry projects which reduce access to investment capital. Because of this the participatory role of communities in planning and budgeting enable stakeholders to identify resources among communities which can be used in projects and activities thus reduce their dependence on donors. These findings point towards earlier findings that reported volunteer activities and practices towards forest sustainability have remained uncoordinated and inadequately supported by our local communities. People are key actors in socio-ecological system and disregard for local claims and needs has resulted in failure of many forestry projects (Vanhanen, et al., 2010). People in the world over engage in volunteerism for a great variety of reasons such as to eliminate poverty, to tackle environmental issues, to reduce risk of disasters or to combat social exclusion and violent conflict.

It emerged that 69 (44.2%) of the youths who participated in this study asserted that participation in forestry projects is time consuming which affects sustainability at a mean of 4.28. It is further indicated that 57 (36.5%) disagreed that agreements on conservation costs by stakeholders are based on a win-win situation thus affecting forest sustainability at a mean of 2.67. Another 87 (55.28%) disagreed that any form of payment permitted in my group would affect forest sustainability at a mean of 3.12. These findings indicate that resource mobilization is crucial determinant of sustainability of indigenous forests. The community plays a crucial role in mobilizing resources that significantly reduces their dependence on donors. However, long term plan for mobilizing resources requires total volunteerism both in contribution of material/financial and labour support. Therefore, the potential for the resources to support forest projects for a long period of time demands total commitment from the local people. Similar findings were reported by (Suharti, 2001) that dealing with environmental problems requires solutions sensitive to local, social and ecological conditions. It also requires a community with volunteers who are able to identify people's felt needs. Similar findings were reported by (Suharti, 2001) who asserted that the costs of participatory natural resource management included time consumed in attending meetings, limited access to resources such as grazing land, water sources, game meat and agricultural land. There are also hazards involved in the participatory management for example in firefighting. It becomes imperative to involve the major groups in program, project and activity initiation outlining all factors involved to facilitate commitment to the exercise.

It is shown that majority 65 (41.7%) of the youths who participated in this study strongly agreed that they are willing to incur conservation costs to sustain Kakamega forest at a mean of 3.57. This implies that all indigenous people have in common is a deep connection to the natural environments in which they live. This is why indigenous people are on the frontline of nature conservation and preserving the balance of the ecosystem has always been the indigenous way of life. Another 71 (45.3%) stated that attending sensitization meetings affects forest sustainability at a mean of 3.83 whereas 106 (67.9%) indicated that lack of transparency in sensitization meetings would affect attendance hence decreased participation that eventually affects sustainability at a mean of 4.01. There is every indication, 100 (64.1%) of the youths agreed that engaging youths at all times of the project would affect forest sustainability at a mean of 3.55. They only require information through sensitization meetings. To ensure continuity, there should be meetings for ongoing communication throughout the project period to sensitize the community on the benefits of managing the natural forest

sustainably. As reported from previous findings, provision of friendly platforms for implementation of forest programs by volunteers can increase forest participation. There is need to device more people centered approaches which stress empowerment and participation. The developing grass root volunteerism can be an enclave among various organizations and may be able to work towards development of civil society in developing countries (Xu & Ngai, 2011).

4.7. Community Empowerment in Sustainability of Indigenous Forests
The study sought to determine the effects of community empowerment in sustainability of indigenous forests in Kakamega East Sub-County.

Statements	SD		D		U		A		SA			
	F	%	F	%	F	%	F	%	F	%	M	SD
Linking youths with other forest stakeholders	8	5.1	3	1.9	2	1.3	110	70.5	33	21.2	4.0	.876
My organization respects the right of youth	6	3.8	49	31.4	6	3.8	78	50.0	17	10.9	3.32	1.142
My group holds meetings with members periodically	10	6.4	50	32.1	1	0.6	77	49.4	18	11.5	3.27	1.210
Organize workshops on forest needs and approaches	0	0.0	16	10.3	0	0.0	71	45.5	69	44.2	4.23	.895
Operation manual that serves as information sharing	18	11.5	32	20.5	20	12.8	80	51.3	6	3.8	3.15	1.148
Training in group dynamics and team building	4	2.6	27	17.3	3	1.9	108	69.2	14	9.0	3.64	.955
Forest groups are open for youths to join and participate	11	7.1	12	7.7	25	16.0	90	57.7	18	11.5	3.58	1.027
Youths invest in income generating activities	0	0.0	15	9.6	22	14.1	90	57.7	29	18.6	3.85	.833
Youths have other sources of income to support livelihood	0	0.0	15	9.6	0	0.0	90	57.7	51	32.7	4.14	.838
Government funding to the youths	0	0.0	1	0.6	37	23.7	112	71.8	6	3.8	3.78	.588
Valid N (listwise)	156											

Table 9: Descriptive Statistics on Community Empowerment

As indicated in Table 9, 110 (70.5%) of the respondents stated that linking youths with other forest stakeholders in formulating and implementing forest policies affect sustainability at a mean of 4.0. Half, 78 (50.0%) of the youths asserted that my organization respects the right of youths participating in forest management which affects forest sustainability at a mean of 3.32. It is also indicated by 77 (49.4%) of the respondents who stated that my group holds meetings with its youth members periodically to share its success and challenges thus affecting forest sustainability at a mean of 3.27. Results indicate that involving local community youths in information sharing activities has a bearing to improved access to investment capital. Consequently, this improves sustainability issues of indigenous forest by the people. Empowerment expands the capabilities of the poor to undertake future self-help programs through the concept of community participation. These findings are similar to other studies reported by Meshack (2004), that information is a key and knowledge is power and it does not necessarily entail the equal sharing of power. Informed citizens are better equipped to take advantage of opportunities. The relevance of this information is especially important if the poor are to take effective action (Narayan, 2002).

Concerning capacity building and sustainability of indigenous forests, majority 71(45.5%) of the respondents stated that organizing workshops on forest needs and community approaches for the youths affect forest sustainability at a mean of 4.23, whereas more than half, 80 (51.3%) stated that having an operation manual serves as a platform for information sharing among all user groups on matters of the forest has a bearing on forest sustainability at a mean of 3.15. It was also reported that forest group trainings in group dynamics and team building affect sustainability forests in the long run at a mean of 3.64. These results imply that adequate trainings empower the youths which eventually enhance care and conservation of forest trees. It is important for the leaders to provide adequate training on all forest conservation and management issues to all youth members in order to increase their level of participation in forest activities. This definitely increases their potential to safeguard forest trees and increased number of completed forest projects hence sustainability of indigenous forests. According to Macharia (2008) the government should utilize conservation activities as a way of creating income generating activities for youth in the communities to enable them eke a living from the projects. Similarly, participation in development projects is a strong form of empowerment practice. It entails building capacity of the community so that they can make rational decisions and undertake meaningful input for mutual benefit (Meshack, 2004).

Regarding community ownership and sustainability of indigenous forests, majority of the respondents, 90 (57.7%) agreed that forest groups are open for youths to join and participate in the development of forest projects which affect sustainability at a mean of 3.58. Similarly, an equal proportion 90 (57.7%) of the respondents stated that youths investing in income generating activities like value addition and they have other sources of income to support livelihood

which affects access to investment capital at a mean of 3.85 and 4.14 respectively. Therefore, illegal forest and poaching activities significantly reduce to very low rates since community members are frequently trained and safeguard the public resources collectively. Another 112 (71.8%) stated that Government funding to the youth's forest projects affect access to investment capital and completed projects around the forest. In a study by Musyoki, Mugwe, Mutundu and Manchuria (2016), training and capacity building in forest conservation and management of indigenous forests was identified as a factor contributing to high level community participation of CFA members. Moreover, majority of the CFA members who planted trees in their farms had a high level of participation in PFM and a high benefit perception. Thus, a high level of participation of CFA members in forest patrol, fire control, tree nursery activities, and tree planting was associated with training and high PFM benefit perception.

These findings are also similar to that of Brosius (2005) who asserted that there are moral reasons why communities should be allowed to manage their forests since many depend on natural resources for basic survival and livelihoods. People should rightly have control over their own destinies and this translates into secure land tenure with a reasonably long-term agreement, (Pierce Colfer & Byron, 2001). Longer-term security of land ownership and legally recognized rights and responsibilities not only creates incentives to manage resources more sustainably but also has implications for the health of local people and cultures.

4.8. Project Implementation and Sustainability of Indigenous Forests

The study sought to determine the effects of project implementation on sustainability of indigenous forests in Kakamega East Sub-County.

Statements	SD		D		U		A		SA			
	F	%	F	%	F	%	F	%	F	%	M	SD
Accounting projects affect forest sustainability	3	1.9	30	19.2	22	14.1	91	58.3	10	6.4	3.48	.939
Youths have a role in accounting for projects	3	1.9	54	34.6	46	29.5	50	32.1	3	1.9	2.97	.908
Sharing reports with the community periodically	0	0.0	47	30.1	4	2.6	75	48.1	30	19.2	3.56	1.114
My group ensures strict enforcement of laws & rules	1	0.6	59	37.8	20	12.8	69	44.2	7	4.5	3.14	1.006
Conservation strategies are based on consent of youths	14	9.0	29	18.6	12	7.7	87	55.8	14	9.0	3.37	1.154
Conserving the forest through forest patrols	8	5.1	27	17.3	10	6.4	109	69.9	2	1.3	3.44	.965
Involving youths in monitoring projects	0	0.0	0	0.0	0	0.0	121	77.6	35	22.4	4.22	.418
Continuous monitoring of forest projects by youths	9	5.8	59	37.8	42	26.9	37	23.7	9	5.8	2.85	1.031
Group has a working tool for monitoring and evaluation	6	3.8	24	15.4	70	44.9	51	32.7	5	3.2	3.16	.861
M&E reports are submitted quarterly for sharing	23	14.7	39	25.0	31	19.9	50	32.1	13	8.3	2.94	1.224
Valid N (listwise)	156											

Table 10: Descriptive Statistics on Community Project Implementation

As revealed in Table 10, 91 (58.3%) of the respondents agreed that accounting for forest projects as a team of stakeholders affect forest sustainability at a mean of 3.48 whereas 54 (34.6%) disagreed that every youth has a role in accounting for forestry projects which determine number of completed projects at a mean of 2.97. It is also indicated by 75 (48.1%) of the respondents that to some extent, sharing accounting reports with the community periodically affects forest sustainability at a mean of 3.56. Accountability emanating from the democratic form of governance gives the right to be accounted to and to account to others. The findings imply that participants of this study do not adequately involve in accounting of forest projects in Kakamega East Sub-County. Lack of accountability by managers to the community led youths' unwillingness to join the conservation groups from households' hence decreased number of successfully completed forests projects. Access to investment capital also declined due to few numbers of community youths hence reduced state of sustainability. These results point towards a study by Narayan (2002) who reported that adequate accountability of projects leads to expansion of assets and capabilities of poor people to participate and negotiate with, influence, control, and they hold accountable institutions that affect their lives

Regarding enforcement of existing environmental laws, findings in Table 10 also shows that 69 (44.2%) of the respondents agreed that their group ensures strict enforcement of laws, rules and regulations in place which has a bearing to sustainability at a mean of 3.14 as 87 (55.8%) agreed conservation strategies in their groups are based on the consent of surrounding community whose life it affects hence at a mean of 3.37. Pagdee, Kim and Daugherty (2006) reported that well-defined property rights, effective institutional arrangements, and community interests and incentives are critical

elements of community participation in successful community forestry. Without these elements, it is very difficult to secure the survival of natural forests and the wellbeing of forest-dependent communities. Additionally, another 109 (69.9%) of the youths agreed that conserving the forest through forest patrols affect its sustainability at a mean of 3.44. These findings are similar to those by Clements, Ashish, Karen, Dan, Setha and Milner-Gulland (2010) in Cambodia, which reported weak institutions and poor governance were at the root of widespread land disputes. Even land allocated for community forestry is not safe from land-grabbing and commercial exploitation. Ineffective environmental law enforcement makes it almost impossible for community forestry groups to assert their rights of ownership especially against powerful, self-interested adversaries. This emphasizes the need to support sustainable forest management through instituting clearly defined property rights and building the capacity of local institutions so as to strengthen enforcement and compliance unit for proper law enforcement.

Concerning Community Monitoring and Evaluation of forest projects, an overwhelming majority, 121 (77.6%) of the youths agreed that involving youths in monitoring project implementation has significance to forest sustainability at a mean of 4.22. There is need to actively involve the communities in the decision-making processes from policy formulation through to implementation and even during evaluation. In an attempt where communities are only involved only during implementation of forest programs, this led to deliberate negligence of the programs by the local communities and ultimately failure. In other terms, projects fail if the stakeholders are not fully involved in all the stages of project implementation. This result is in agreement to the case study of Osoam community forestry which outlined the critical issues of insecure land tenure, disorganized local institutions and insufficient technical and financial support that jeopardized the overall aim of achieving sustainable forest management and poverty reduction (de Lopez, 2004). However, quite a number of youths 59 37.8%) disagreed that continuous monitoring of forest projects by youths affects forest sustainability at a mean of 2.85. Another 70 (44.9%) of the youths were not aware whether the organization has a working tool for monitoring and evaluation at a mean of 3.16. This result implies that among the youths in Kakamega East Sub-County have limited knowledge about M&E hence limited participation in project implementation thus affects sustainability. Even though, there was elements of group monitoring reports submitted quarterly to members for sharing and way forward, only 50 (32.1%) of the respondents agreed at a mean of 2.94. according to Sokh and Iida (2001), monitoring and evaluation of community forestry activities is required to find out what has worked and what has not.

According to (World Bank, 2011) report, M&E is often overlooked but important component to community development. An M&E system provides regular flow of information on the performance of policies and highlights periodic oversight of the implementation of an activity which seeks to establish the extent to which input deliveries, work schedules, other required actions and targeted outputs are proceeding according to plan, so that timely action can be taken to correct deficiencies detected. This aspect therefore, requires time and dedicated volunteer members of the community in order to succeed the implementation of forest projects. Monitoring is an ongoing process of data capture and analysis's for primarily project control with an internally driven emphasis on efficiency of project (Crawford & Bryce, 2003). Ongoing project evaluation is viewed as a valuable tool to promote sustainability in addition to achieving alignment of the project's characteristics with the needs of its stake holders (Johnson et al., 2004).

4.9. Inferential Statistics

The main objective of the study was to investigate the determinants of community participation in sustainability of indigenous forest in Kakamega East Sub-County. There were four independent variables namely; community decision making, community volunteerism, community empowerment and community project implementation. The four variables were explaining the dependent variable (sustainability of indigenous forest). A correlation analysis was done between the four explanatory variables and the response variable so as to measure the level and nature of dependence. Here Pearson's correlation was used for measurement of the relationship. Regression analysis was used to predict the sustainability of indigenous forest using the four explanatory variables.

4.9.1. Correlation Analysis between Determinants of Community Participation in Sustainability of Indigenous Forest

From the table on correlation of community decision making, the Pearson correlation coefficient of 0.521 shows that there is a direct relationship between community decision making and sustainability of indigenous forest. The correlation is significant at 5% level of significance. This is indicated by the p value of 0.000.

The correlation of community volunteerism and sustainability of indigenous forest displays the Pearson's correlation coefficient as 0.533. This implies that there is a direct relationship between sustainability of indigenous forest score and community volunteerism. It further implies that an increase in one variable increase the other one and vice versa. The p value shows that the correlation coefficient is significant at 5% level of significance.

As evidenced from table on the correlation between sustainability of indigenous forest and community project implementation, the Pearson's correlation coefficient of 0.032 shows that there is a direct relationship between the two variables. It further implies that an increase in a unit of community project implementation increase the sustainability of indigenous forest score and vice versa. The correlation is significant at 5% level of significance further implying a relation between the two variables.

Correlations			CE	CD	CV	CI
Control Variables			CE	CD	CV	CI
sustainability	CE	Correlation	1.000	.521	.533	.032
		Significance (2-tailed)	.	.000	.000	.690
		df	0	153	153	153
	CD	Correlation	.521	1.000	.723	.227
		Significance (2-tailed)	.000	.	.000	.005
		df	153	0	153	153
	CV	Correlation	.533	.723	1.000	.345
		Significance (2-tailed)	.000	.000	.	.000
		df	153	153	0	153
	CI	Correlation	.032	.227	.345	1.000
		Significance (2-tailed)	.690	.005	.000	.
		df	153	153	153	0

Table 11

4.9.2. Multiple Regression Analysis for Different Determinants of Community Participation in Sustainability of Indigenous Forest

From Table 11, it is clear that the overall ANOVA is significant in predicting how community decision making, community volunteerism, community empowerment and project implementation determine sustainability of indigenous forest in Kakamega East Sub County. Findings show that there was a statistically significant difference between groups as determined by one-way ANOVA ($F_{(4,151)}$ = 597.190, p = .000). The p value for the F test is less than 0.05 implying that the independent variables are good in explaining the variation in sustainability of indigenous forest score. Two independent variables are not significant in the regression analysis at 5% level of significance, this were; community decision making and community volunteerism. This is because their p values were greater than 0.05. A constant of -0.051 shows that if all the independent variables had a score of zero, the sustainability of indigenous forests score is reduced by 0.051. From the table, an increase in one unit of community decision making increases the sustainability of indigenous forest score by 0.111, an increase in one unit of community volunteerism reduces the sustainability of indigenous forest score by 0.057, an increase in one unit of community empowering increases the sustainability of indigenous forest score by 0.269 and lastly an increase in one unit of community project implementation increases the sustainability of indigenous forest by 0.684.

Having achieved objective 1 on the relationship between community decision making and sustainability of indigenous forest in Kakamega East Sub-County, the study rejects the null hypothesis that: Ho: There is no significant relationship between community decision making (p= 0.096) and sustainability of indigenous forest in Kakamega East Sub-County.

Having achieved the objective 2 on the relationship between community volunteerism and sustainability of indigenous forest in Kakamega East Sub-County, the study does not reject the null hypothesis: H0: There is no significant relationship between community volunteerism and sustainability of indigenous forest in Kakamega East Sub-County.

Having achieved objective 3 on the relationship between community empowerment and sustainability of indigenous forest in Kakamega East Sub-County, the study accepts the null hypothesis that; H0: There is no significant relationship between community empowerment and sustainability of indigenous forest in Kakamega East Sub-County.

Having achieved the objective 4 on the relationship between community project implementation and sustainability of indigenous forest in Kakamega East Sub-County, the study accepts the null hypothesis; H1: There is no significant relationship between community project implementation and sustainability of indigenous forest in Kakamega East Sub-County.

ANOVA[a]						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	163.239	4	40.810	597.190	.000[b]
	Residual	10.319	151	.068		
	Total	173.558	155			

Table 12
a. Dependent Variable: Sustainability
b. Predictors: (Constant), Implementation, Empowering, Decision, Volunteering

Coefficients[a]					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-.051	.082		-.625	.533
decision	.111	.066	.119	1.673	.096
volunteering	-.057	.066	-.067	-.860	.391
empowering	.269	.056	.263	4.847	.000
implementation	.684	.051	.683	13.331	.000

Table 13
a. Dependent Variable: sustainability

4.9.2. Regression Model
Furthermore, the current study determined multiple regression model based on the following formula:
$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$.
Table above presents the regression results on how decision making, volunteerism, empowerment and project implementation determine sustainability of indigenous forest in Kakamega East Sub-County. The multiple regression equation was that: $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$ and the multiple regression equation became:
$Y = -0.051 + 0.111 X_1 - 0.057 X_2 + 0.269 X_3 + 0.684 X_4$.
As depicted in Table 11, there was positive and insignificant influence of community decision making on sustainability of indigenous forest ($\beta = 0.878$; $t = 5.515$; $p > 0.05$). There was positive and insignificant influence of community volunteerism on sustainability of indigenous forest ($\beta = 0.111$; $t = 1.673$; $p > 0.05$). There was also an inverse and insignificant influence of community empowerment on sustainability of indigenous forest ($\beta = -0.057$; $t = -0.860$; $p < 0.05$). Finally, there was also a positive and significant influence of project implementation on sustainability of indigenous forest ($\beta = 0.684$; $t = 13.331$; $p < 0.05$).
The new regression equation therefore is
$Y = -0.051 + 0.269 X_3 + 0.684 X_4$
This regression line forms the correct model as the variables, community decision making and volunteerism were insignificant ($p > 0.05$) hence cannot be included in the original multiple regression equation. As such they cannot be determinants of community participation in sustainability of indigenous forest in Kakamega West subcounty.

5. Summary, Conclusions and Recommendations

5.1. Introduction
In this chapter, a summary of the findings from the study is shown together with the conclusion and recommendations. The summaries are done on the descriptive of the determinants of community participation in sustainability of indigenous forest in Kakamega West Sub-county. The summary on the inferential statistics has also been outlined in this section. The conclusion is in the second section on this chapter while recommendation the third section which also indicate on the further areas of study.

5.2. Summary of Findings
The main objective was to investigate the determinants of community participation in sustainability of indigenous forest in Kakamega West Sub-county. The response rate in this study was enough in making conclusion about the population under study using the sample statistics. Demographic findings show that 63.5% of the respondents were male while 36.5% were female hence more men participated in sustainability of indigenous forests in Kakamega East Sub-County. Most of the respondents involved in forestry were youth between 23-27 years by 48.1% responses. Moreover, almost half, 49.1% of the youths had secondary education as the highest academic qualification.

5.2.1. Community Decision Making and Sustainability of Indigenous Forest in Kakamega East Sub-County
The finding indicated that there is insignificant relationship between community decision making and sustainability of indigenous forest in Kakamega East Sub-County. This relationship is insignificant meaning it does not measure satisfactorily. The regression parameter is insignificant meaning it cannot be used to make predictions. The study accepted the null hypothesis that: Ho: There is no significant relationship between community decision making and sustainability of indigenous forest in Kakamega East Sub-County

5.2.2. Community Volunteerism and Sustainability of Indigenous Forest in Kakamega East Sub-County
The findings indicated that the level of relationship to be a direct relationship. The regression parameter is significant. The study concluded the findings of analysis on the community volunteerism and sustainability of indigenous forest by rejecting the null hypothesis and accepting the alternative hypothesis that: H1: There is a significant relationship between community volunteerism and sustainability of indigenous forest in Kakamega East Sub-County.
.
5.2.3. Community Empowerment and Sustainability of Indigenous Forest in Kakamega East Sub-County
The analysis revealed the correlation coefficient is a fair inverse relationship between farming income and household food security. The regression parameter is significant. Having achieved the objective, the study accepts the null

hypothesis that; H0: There is no significant relationship between community empowerment and sustainability of indigenous forest in Kakamega East Sub-County.

5.2.4. Community Project Implementation and Sustainability of Indigenous Forest in Kakamega East Sub-County
The analysis revealed a correlation coefficient is a direct relationship between community project implementation and sustainability of indigenous forest scores. The relationship is significant. The regression parameter is significant and can be used in prediction. Therefore, having achieved the objective, the study does not reject the null hypothesis that; H1: There is no significant relationship between community project implementation and sustainability of indigenous forest in Kakamega East Sub-County.

5.3. Conclusion
There were four specific objectives that were to be achieved at the end of the study period that forms conclusion of every objective:

- To determine the influence of community decision making in sustainability of indigenous forest in Kakamega East Sub-County. It is very clear from the analysis that there is no significant relationship between community decision making and sustainability of indigenous forest in Kakamega East Sub-County. Community decision making explains very small change in sustainability of indigenous forest scores. Community decision making cannot be used in prediction.
- To assess the influence of community volunteerism in sustainability of indigenous forest in Kakamega East Sub-County. There is no significant relationship between community volunteerism and sustainability of indigenous forest in Kakamega East Sub-County. Community volunteerism explains very small change in sustainability of indigenous forest scores. Community volunteerism as such cannot be used in the prediction.
- To determine how community empowerment influences sustainability of indigenous forest in Kakamega East Sub-County. The regression parameter community empowerment is significant. Having achieved the objective, the study accepts the null hypothesis that; H0: There is no significant relationship between community empowerment and sustainability of indigenous forest in Kakamega East Sub-County.
- To determine the influence of community project implementation in sustainability of indigenous forest in Kakamega East Sub-County. The relationship is significant. The regression parameter is significant and can be used in prediction. Therefore, having achieved the objective, the study does not reject the null hypothesis that; H1: There is no significant relationship between community project implementation and sustainability of indigenous forest in Kakamega East Sub-County.

5.4. Implication of the Research
The study established community empowerment and community project implementation have an impact in the sustainability of indigenous forests in Kakamega East Sub-county. The results indicate that an increase in the scores of community empowerment and community project implementation increases the scores in sustainability of indigenous forest. This further implies that the forestry services and the community around the forest can continue improving the community empowerment as a way to improve the interaction between community and forest activities and improve sustainability of indigenous forests. Community volunteerism by youths should also be increased with an aim of making the community youth be involved in projects that contribute to sustainability of indigenous forests.

5.5. Recommendations
The recommendations of the research were made on foundation laid by summary of finding and conclusion. We had two roles that were significantly affecting the sustainability of indigenous forests; community empowerment and community project management. The forest services should improve on community empowerment and vol so that more youth in the community are able to have access on them. They should also advice youth on how they can make use of the volunteerism to tap opportunities that helped increase forest sustainability. On community empowerment, the forest services should increase the extension, capacity building and training that is offered to the community so as to help them to become knowledgeable of the importance of the forest. It can also advise them on how to use the forest so that they can improve on their livelihood.

Community decision making and community volunteerism was not significant in sustainability of indigenous forest scores. This pushes community and forest services to do something about these two variables. The forest services should offer more volunteer opportunities at the forest to the community youth. Since it is clear that majority of the youth had attained secondary education. Again, the community should enable youth to be involved in decision making on the forest resource. This helped them to be involved in sustainability initiatives in the forest.

In a nutshell the policy makers, the forest services and the government need to effectively plan on how they can improve the livelihood of the community youth by improving community volunteerism in the forest for the locals, increase capacity building and training, increasing the space for decision making for the youth, generate opportunities for the youth to invest in the forest and finally increase and make accessible the project initiatives for implementation by youth.

5.6. Areas of Further Research

The study limited itself to the four roles of farming namely community decision making, community volunteerism, community empowerment and community project implementation on sustainability of indigenous forest. The lead researcher recommends other areas that can be considered as a gap.

- The study recommends that further research be carried out to find the influence of public participation in management of forests resources. It is also suggested that studies should be done in other areas with forests
- The cross-section research can be extended to other parts of western Kenya so as to determine how they are affected by the variables under study

6. Acknowledgement

7. Acronyms and Abbreviations

CBD	=	Community Based Development
CBFM	=	Community-Based Forest Management
CBO	=	Community Based Organization
CFA	=	Community Forest Association
FAN	=	Forest Action Network
FAO	=	Food and Agricultural Organization
KFS	=	Kenya Forest Service
KFWG	=	Kenya Forest Working Group
KWS	=	Kenya Wildlife Service
M&E	=	Monitoring and Evaluation
NGO	=	Non-Governmental Organization
PFM	=	Participatory Forest Management
SFM	=	Sustainable Forest Management
SPSS	**=**	Statistical Package for Social Sciences

8. References

i. Agrawal, A., Chhatre, A., & Hardin, R. (2008). Changing governance of the world's forests. Science , 1460-1462.
ii. Aryal, S., Bhattarai, D. R., & Devkota, R. P. (2013). Comparison of carbon stocks between mixed and pine-dominated forest stands within the Gwalinidaha Community Forest in Lalitpur District, Nepal. Small Scale Forestry 12(4) , 659-666.
iii. Biota. (2004). Biodiversity in Conversion: the influence of Fragmentation and Disturbance on the Biodiversity of East african highland rain forests.
iv. Bluman, A. G. (2009). Elementary Statistics. A step by step approach. USA: McGraw-Hill.
v. Clements, T., Ashish, J., Karen, N., Dan, A., Setha, T., & Milner-Gulland, E. J. (2010). "Payments for Biodiversity Conservation in the Context of Weak Institutions: Comparison of three programmes from Cambodia". Ecological Economics 69(6) , 1283-1291.
vi. Clewel, A., & Aronson, J. (2013). Ecological restoration: Principles, values and structure of an emerging profession. 2nd edition. Washington DC: Island Press.
vii. Cohen, L., Manion, L., & Morrison, K. R. (2007). Research methods in Education (6th edition). Routledge.
viii. Copper, R. D., & Schindler, P. S. (2011). Business Research Methods (11th ed.). New York, united States: McGraw-Hill Publications.
ix. Cowie, C. (2010). Volunteer matter: The geographies of community-based ecological restoration groups in the Wellington Region. Wellington: Unpublished Master's thesis, Victoria University of Wellington.
x. Davids, I. T. (2009). Participatory development in South Africa: A development management Perspective. Pretoria: Van Schaik.
xi. Easterby-Smith, M., Thorpe, R., & Lowe, A. (2002). Management Research. An Introduction (2nd edition). London: Sage.
xii. FAO. (2010). Global forest resource assessment. Rome, Italy: Food isnd Agriculture Organization.
xiii. FAO. (2010). Global forest resource assessment. Rome, Italy.
xiv. Fletcher, A. (2012, November). A chase through the maze. Creative Commons .
xv. Forest, D. o. (2013). Community forest management programme. Kathmandu, Nepal. Nepal: Department of Forest, Ministry of Forest and Soil Conservation.
xvi. Gamble, N., & Weil, M. (1995). The Handbook of Community Practice. Columbia: Columbia University Press.

xvii. Gautam, C. M., & Watanabe, T. (2009). Assessment of role of community forest (CFs) in CO2 sequestration, iodiversity and land use change. Kathmandu, Nepal: Nepal development research institute.

xviii. GoK. (2005). Forest Act. Nairobi: GoK.

xix. GoK. (2012). Kakamega Forest Ecosystem Management Plan 2012-2022. Nairobi: KFS/KWS.

xx. GoK. (2015). Kakamega Forest Strategic Ecosystem Management Plan 2015-2040. Nairobi: Kenya Forest service.

xxi. GoK. (2016). The National Volunteerism Policy. Nairobi: Ministry of Labour , Social Security and Services.

xxii. Guthiga, P., & Mburu, J. (2006). Local communities' incentives for forest conservation: case of Kakamega Forest in Kenya. 11th Biannual Conference of International Association for the Study of Common Property. Bali, Indonesia.

xxiii. Handford, P. (2011). Community Conservation in New Zealand: Towards a shared approach. Wellington: World Wildfire Fund for Nature. 20p.

xxiv. Hardie-Boys. (2010). Valuing community group contributions to conservation. Science for Conservation report no. 299. Wellington: Department of Conservation.

xxv. Harrison, M. (2012). Biosecurity community group survey. Auckland: Biosecurity, Auckland Council. 23p.

xxvi. Holder, C. D., & Chase, G. (2011). the role of remittances and decentralization of forest management in the sustainability of a municipal-communal pine forest in eastern Guatemala. Environ Dev Sustain, 14 , 25-43.

xxvii. Joshi, G. R., & Aryal, S. (2014). Opportunity cost, wilingness to pay and cost benefit analysis of a comunity forest of Nepal. International Journal of Environment, 3(2) , 108-124.

xxviii. Kanel, K. R., Shah, S. B., Poudel, K., & Regmi, N. P. (2009). Quick assessment of land use, forestry policy and governance. Kathmandu, Nepal: Ministry of Forest and Soil Conservation.

xxix. Karky, B. S. (2005). Who will grow the forest, bring benefit, and save the earth? (Vol. XII). Kathmandu, Nepal: Resources Himalaya Foundation.

xxx. Karky, B. S., & Banskota, K. (2007). The Kyoto Protocal and Community managed forests. Kathmandu, Nepal: international Centre For Intergrated Mountain Development .

xxxi. Kiefaber, K., Gass, R., & Rickenbach, M. (2009). An introduction to Wisconsin's Forest Sustainability Framework: Creating Knowledge to sustain our forests. Madison: Wisconsin Department of Natural Resources.

xxxii. Korten, D. (1980). Community organization and rural development: A learning proess approach in public adminstration. 480.

xxxiii. Kothari, C. R. (2004). Research Methodology, 2nd Ed. New Delhi: New Age International Publishers.

xxxiv. Kothari, C. R. (2014). Research Methodology: Methods and techniques. New Delhi: New Age International (P) Ltd Publishers.

xxxv. Kothari, C. R. (2003). Researh methodology: methods & techniques (2nd edition). Nairobi: New Age international Publishers.

xxxvi. Kozak, R. A., Spetic, W. C., Harshaw, H. W., Maness, T. C., & Sheppard, S. (2008). Public priorities for sustainable forest management in six forest dependent communities of British Columbia. Canadian Journal of Forest Research, 38(12) , 3071-3084.

xxxvii. Le, D., Lintangah, W., Pretzsch, J., Weber, N., & Bao, H. (2012). Implementation of sustainable forest management in two different forest management unit models in Vietnam and Malaysia. Germany.

xxxviii. Lind, D. A., Marchal, W. G., & Wathen, S. A. (2008). Statistical Techniques in Business & Economics (13th edition). 2008: McGraw-Hill.

xxxix. Lintangah, W., & Weber, N. (2015). Implementation of sustainable forest management: An application of the triple perspective typology of stakeholder thery in a case study in Sabah, Malaysia. Journalof Forest and Landscape Research 1 , 1-11.

xl. Macharia, B. W. (2015). Factors influencing community participation in Forestry conservation projects: A case of Kithoka-Twajai Forest Community Based organization, Meru County Kenya. Meru.

xli. Marharjan, K. (2003). Community participation in forest resource management in Nepal. Graduate school for international Development and Cooperation .

xlii. Measham, T., & Barnett, G. B. (2008). Environmental volunteering:Motivations, modes and outcomes. Australian Geographer 39 , 537-552.

xliii. Ming'ate, F. L., Letema, S., & Obiero, K. (2016). Designing a Functioning Community Forest Association: A Case of Muileshi, Kakamega County, Kenya. Asian Journal of Applied Sciences , 1209-1214.

xliv. Mogoi, J., Obonyo, E., Ongugo, P., Oeba, V., & Mwangi, E. (2012). Communities, property rights and forest decentralisation in Kenya: Early lessons from participatory forestry management. Science citation index , 182-194.

xlv. Moss, C. (2012). Nepalese community forestry expert: With green forest comes a green economy. Nepal.

xlvi. Mugenda, O. M., & Mugenda, A. G. (2003). Research Methods: Quantitative and Qualitative Approaches. Nairobi: Acts Press.

xlvii. Mutoko, M., Hein, L., & Shisanya, C. (2015). The tropical conservation versus conversion trade-offs. Insight from analysis of ecosystem services provided by Kakamega rainforest in Kenya. Ecosystem services .

xlviii. N., G., & Weil, M. (1995). The Handbook of Community Practice. Columbia: Columbia University Press.

xlix. Nesheim, I., & Halvorsen, R. (2011). Selective logging and regeneration of timberspecies in the Maya Biosphere Reserve in Guatemala. Journal of Sustainable Forestry, 30(8) , 850-865.

l. Ofuoku, A. U. (2011). Effect of commnity participation on sustainability or rural water projects in Delta Central agricultural zone of Delta State, Nigeria. Journal of Agricultural Extension and Rurak Development Vol. 3(7) , 130-136.

Ii.   Ongugo, P. O., Mogoi, J. N., Obonyo, E., & Oeba, V. O. (2008). Examining the roles of community forest associations (CFAs) in the decentralization process of Kenyan Forests. England: IASC Conference.

Iii.   Osumba, P. A. (2011). Pay back anticipation: A driving force in communities participation in forest management. 13th Biennial Conference of International Association for the Study of the Commons (pp. 1-15). India: Kenyatta University.

Iiii. Patel, T., Dhiaulhaq, A., Gritten, D., Yasmi, Y., Bruyn, T. D., Paudel, N. S., (2013). Predicting future conflict under REDD+implementation. Forest, 4(2) , 343-363.

Iiv.   Practice, T. h., & Weil, M. (1995). Gamble, N. Columbia: Columbia University Press.

Iv.   RGC, R. G. (2013). Rectangular Strategy for Growth, Employment, Equity and Efficiency Phase III.

Ivi.   Ritchie, H. (2011). From eyesore to asset: Care groups review. Report no. 24. Hamilton: Waikato regional Council. 30p.

Ivii. Schofield, W. (1996). Survey sampling. In R. Sapsford and V. Jupp (1996) (eds) Data collection and Analysis. London: Sage and the Open University Press.

Iviii. Sekaran, U., & Bougie, R. (2010). Research Methods for Business: A skill Building Approach, (5th Edition). N. J. Chichester: John Wiley & Sons: Hoboken.

Iix.   Smith, H. W. (1975). Strategies of Social research: The methodological Imagination. London: Prentice Hall.

Ix.   Suharti, S. (2001). Increased community participation in forest management through the development of social forestry programmes in Indonesia. The Balance between Biodiversity Conservation and Sustainable Use of Tropical Rain Forests , 233-244.

Ixi.   Sukhdev, P., Stone, S., & Nuttall, N. (2010). Green economy: Developing countries success stories. Geneva, Switzerland: United Nations Environment Programme.

Ixii. Trotter, R. T., & Whitham, T. G. (2011). The roles of climate variability and habitat heterogeneity in structuring a forested system: An intergrated accumulation funtion of species richness. Journal of Sustainable Forestry, 30(8) , 721-735.

Ixiii. Trust, N. Z. (2013). Kiwi coast project plan. Hamilton: NZ Landcare Trust. 13p.

Ixiv. Ty, S. (2013). "Evaluation of Community Forestry in Cambodia". Cambodia: Presentation at Asia Forest Workshop, Phnom Penh, 3-4.

Ixv.   UNV. (2015). State of the world's volunteerism Report: Transforming governance .

Ixvi. Vanhanen, H., Rayner, J., Yasmi, Y., Enters, T., Fabra-Crespo, M., Kanowski, P. (2010). Forestry in Changing Soil Landscapes. Vantaa, Finland: International Union of Forest research Organizations.

Ixvii. W.Ayiemba, Mbithi, D., Nahama, E., Kagombe, J., Njuguna, L. W., Laigong, J., et al. (July 15-16, 2014). Enhancing Participatory Forest management under the devolved governance structure. 2nd National PFM Conference. Muguga, Kenya: Kenya Forestry Research Institute.

Ixviii. WhangareHeadsLandCareForum. (2010). Work plan for the restoration of the biodiversity values of the Whangare Heads Landcare Forum.

Appendix

Letter of Introduction
JOMO KENYATTA UNIVERSITY OF
AGRICULTURE AND TECHNOLOGY
P. O. BOX
Kakamega
The Assistant Chief
Virhembe Sub Location
Re: Permission to Conduct a Study on Role of Community Participation in Sustainability of Indigenous Forest In Kakamega East
I am a student at Jomo Kenyatta University of Agriculture and Technology pursuing a Master of Science degree in Development Studies. Currently I am in the process of undertaking a research on Role of Community Participation in sustainability of Indigenous Forests in Kakamega East Sub-County. The study will involve collecting data from 205 respondents in your community. The purpose of this letter is to request your office to grant me permission to carry out the study in your organization.
Yours faithfully,
Norah Wafula
JKUAT
CC: Kakamega Forest Manager

Questionnaire
My name is Norah Wafula a student at the Jomo Kenyatta University of Agriculture and technology studying for a Master's Degree program. This questionnaire is intended to help in data collection of a research entitled: "*the role of community participation in sustainability of indigenous forests in Kakamega East Sub-County, Kenya".* Please note that you have been identified as a potential respondent of this academic research and all information you will provide will be treated with utmost confidentiality.

Give your response by ticking where appropriate [√].
Section A: Demographic Information
1. What is your gender?
        a) Male [ ]   b) Female [ ]
2. Please indicate your age a) 18-22 [ ] b) 23-27 years [ ] c) 28-32 years d) Over 32 years [ ]
3. Please indicate your marital status
        a) Single [ ] b) Married [ ] c) Widow/widower [ ] d) Others [ ]
4. Indicate your length of service in the forest group.
    a)   Never joined [ ]   b) 1-5 years [ ] c) 6- 10 years [ ] d) over 10 years [ ]
5. Please indicate the highest level of your academic qualification.
  Primary [ ]   Secondary [ ] Diploma [ ] Degree [ ] Never joined [ ]

Section B: Community Participation
        The following statements are regarded to community participation. Kindly respond with the response that matches your opinion by ticking your appropriate answer in the boxes and filling the blank spaces where necessary.

No	Community Decision Making	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1	Power distribution affects youth participation in forests development projects hence sustainability.					
2	I frequently participate in decision making to sustain the forest which affects sustainability.					
3	I am involved at all levels of decision making towards forest programmes.					
4	My group has a participatory forest management plan for guiding its people to sustain the forest which affects sustainability.					
5	Fair and equitable distribution of forest benefits has an effect on sustainability					
6	Involving all members of the community in distribution of forest benefits affects sustainability.					
7	The local knowledge is useful towards forest sustainability.					
8	I have authority to engage in forest activities in my community which affects forest sustainability.					
9	Lack of forest management plan affects forest sustainability.					
10	I am willing to participate in the management of Kakamega forest for sustainability.					

Table 14: Community Decision Making

No	Community Volunteerism	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1	Volunteering my services towards forest projects affects its sustainability.					
2	Forestry projects fail due to lack of coordination of activities hence sustainability.					
3	Poor coordination of forest volunteers affects forest sustainability.					
4	Participation in forestry projects is time consuming which affects sustainability.					
5	Agreements on conservation costs by stakeholders are based on a win-win situation thus affecting forest sustainability.					
6	Any form of payment permitted in my group would affect forest sustainability.					
7	I am willing to incur conservation costs to sustain Kakamega forest.					
8	Attending sensitization meetings affects forest sustainability.					
9	Lack of transparency in sensitization meetings would affect attendance hence sustainability.					
10	Engaging youths at all times of the project would affect forest sustainability.					

Table 15: Community Volunteerism

No	Community Empowerment	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1	Linking youths with other forest stakeholders in formulating and implementing forest policies affect sustainability.					
2	My organization respects the right of youth participating in forest management which affects forest sustainability.					
3	My group holds meetings with its youth members periodically to share its success and challenges thus affecting forest sustainability.					
4	Organizing workshops on forest needs and community approaches for the youths affect forest sustainability.					
5	Having an operation manual that serves as a platform for information sharing among all user groups on matters of the forest affects forest sustainability.					
6	Forest groups training in group dynamics and team building affect sustainability.					
7	Forest groups are open for youths to join and participate in the development of forest projects which affect sustainability.					
8	Youths investing in income generating activities like value addition affect forest sustainability.					
9	Youths having other sources of income to support livelihood affects forest sustainability.					
10	Government funding to the youths affect forest sustainability.					

Table 16: Community Empowerment

No	Community project Implementation	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1	Do you agree accounting for forest projects as a team of stakeholders affect forest sustainability					
2	Every youth has a role in accounting for forestry projects hence forest sustainability.					
3	Sharing accounting reports with the community periodically affect forest sustainability.					
4	My group ensures strict enforcement of laws, rules and regulations in place which affects sustainability.					
5	The conservation strategies in my group are based on the consent of surrounding community whose life it affects hence sustainability.					
6	Conserving the forest through forest patrols affect forest sustainability.					
7	Involving youth in monitoring project implementation affect forest sustainability.					
8	Continuous monitoring of forest projects by youths affects forest sustainability.					
9	This organization has a working tool for monitoring and evaluation hence sustainability.					
10	In my group monitoring report is submitted quarterly to members for sharing and way forward.					

Table 17: Community project Implementation