

**SHAMBA SYSTEM OF FOREST MANAGEMENT AND ECONOMIC CHANGE IN
KODERA, HOMABAY COUNTY, 1957-2012**

BY

ODIENY ARTHUR OYUGI

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DECLARATION

The Candidate

I ODIENY ARTHUR OYUGI hereby declare that this thesis is my original work and has not been presented for award of a degree in any university.

Mr. Odieny Arthur Oyugi

PG/MA/007/12

Signature..... Date.....

University Supervisors

This thesis has been submitted for examination with our approval as university supervisors.

Dr. Jacob Adipo Ogallo

Department of History and Archaeology

Maseno University

Signature..... Date.....

Prof. Raphael J.A. Kapiyo

Department of Environmental Science

Maseno University

Signature..... Date.....

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DEDICATION

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ABSTRACT

Shamba system is a scientific management of forests whereby tree seedlings are planted together with food crops to help in tendering the seedlings for 3-5 years when the trees are considered mature. An avalanche of studies in forest history have laid emphasis on the evolution of forest policies, contests and negotiations that engulfed forests in the colonial period in Kenya. These studies concur that the shamba system is under-explored in Kenyan history. Besides that, studies in economic history have not appraised the shamba system as a phenomenon that instigated economic change. Notwithstanding the shamba system success in the colonial period, the policy witnessed success in some forests in Kenya in the post-colonial period but failed in Koderia forest that continued to face forest plundering. The government's persistence in the application of the policy in the wake of a turbulent post-colonial forest history therefore justified an investigation of the effect of the shamba system on forest management. This study was based on the premise that the shamba system has been both historically and scientifically proven to be efficient in establishing forest plantations. The purpose of the study was to find out the forces behind forest plundering in Koderia in spite of the application of the shamba system. The objectives of the study were to: Account for the factors that led to the adoption and application of the shamba system in Koderia forest, (1957-2012), describe the economic aspects that changed following the application of the shamba system in Koderia forest and finally to examine the effect of the shamba system of forest management on Koderia forest. The study adopted a historical descriptive research design. It employed purposive and snowballing sampling techniques. The study area was Koderia forest whose total population people was 8261. The sampled population was 60 respondents. Primary data was collected through Key Informant Interview Guide (15), In-depth- Interview Guide (15) and Focus Group Discussion (30) while secondary data was collected through library research and also from archival reports. Articulation of modes of production theory as articulated by Ray (1977), Pee (1980) and Berman (1985) was adopted in the study. Content validity was ensured through evaluation and correction of research instruments. Reliability of data was done through reconnaissance. Data analysis involved both document and content analysis besides corroborating both secondary and primary data. Presentation of data was done in prose and tables. The study found out that era of disease and epidemic informed the adoption of the shamba system. Besides disease and epidemic, scientific ascendancy era in 1957 led to the adoption of the shamba system to diversify employment in forests. The study further revealed that the shamba system accentuated economic change in Koderia forest when new markets were established and new breeds of tree seedlings were exchanged for money. People migrated from various areas to work in the forest to earn a living. While the policy enhanced forest management and alleviated forest destruction through fires in the colonial period, in the post-colonial period, the policy failed to establish forest plantations due to corruption. The study concludes that the shamba system was still the best approach to forest establishment and communal participation in terms of their technical approach to forest conservation is critical. The study further concludes that plant transfers from the Metropole that was witnessed during the application of the shamba system was an imperial impulse that was geared towards relegating African plants in Koderia forest by adopting exotic species. The study recommended that participation of all stakeholders in forest management be enhanced in order to accommodate dissenting voices such as the community and civil society in pursuit of the core mission of the shamba system practices. The study is significant in demonstrating how forests can be best established and conserved through the shamba system approach to mitigate deforestation as a driver of climate change.

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LIST OF ABBREVIATIONS AND ACRONYMS

ADC	:	African District Councils
CSO	:	Civil Society Organization
DFRD	:	District Focus for Rural Development
EMCA	:	Environmental Management and Coordination Act
FA	:	Forest Association.
FG	:	Forest Guard
G.O.K	:	Government of Kenya
ITTA	:	International Tropical Timber Association
KAFU	:	Kenya Association of Forest Users.
KEFRI	:	Kenya Forestry Research Institute.
KIFCON	:	Kenya indigeneous forest conservation project
LNC	:	Local Native Councils
NEAP	:	National Environment Action Plan
N.R.C	:	Non- resident cultivation. Also <i>shamba system</i> in Kiswahili.
NRM	:	National Resource Management.
NTPF	:	Non- Timber Forest Products.
PMF	:	Participatory Forest Management
UNEP	:	United Nations Environmental Programme.
UNFCC	:	United Nations Framework Convention on Climate Change

DEFINITION OF TERMS

Climate change: Refers to a change in the state of the climate that can be identified in the variability of its properties and that persist for a given period led by human activities.

Deforestation: A natural or anthropogenic process of clearing and removal of forest land where the land is thereafter converted to non- forest forms such as farms, ranches and human settlement.

Drought: A usually severe /prolonged dry period caused by lack of rain.

Economic change: The transformation of aspects of production and source of livelihood when different communities interact. In this case, it refers to the interaction between Africans and Europeans that happened during the colonial period in Koder forest. After independence, the role of Europeans was taken over by the post- colonial forest administrators who were basically Africans.

Forest: A minimum area of 0.05-1.0 hectare (ha) with crown cover of more than 10-30% with trees, with a potential to reach a minimum height of 2-5 meters at maturity. A forest may either consist of closed forest formations where trees of various storey and undergrowth cover a high proportion of the ground or open forest.

Management: Refers to control and regulation of something. In this case, it is the control and regulation of forests through the application of the shamba system.

Native: An indigenous person (not alien) used by the Europeans in a derogatory manner to refer to Africans.

Shamba system: A scientific management of forests whereby tree seedlings are planted together with food crops basically to help in tendering the seedlings up to 3-5 years when the trees are considered mature. As from the year 2012, shamba system practice came to be known as PELIS (Plant Establishment and Livelihood Scheme).

Taungya system: Is referred to as shamba system in East Africa. It is a Hindu word that means

Integration of food crops alongside tree seedlings.

Technology: Used in this work to include artefacts, (technical things) or methods. Africans had technology in forest management before imperialism such as taboo against cutting of certain trees. Shamba system was an alien technology.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Shamba system is a scientific principle of forest plantation establishment in which farmers tend young tree plantations as they produce food crops in private or public forests for two to three years until the tree seedlings become established to grow on their own (Kagombe, 2005). Described as ‘classical scientific forestry’, the policy was practiced in most British dominions with a focus on capital accentuation and environmental stability (Brett & Kruger, 2015). This policy would acquire different names in the various British colonies where it was practised.

Globally, the best shamba system practices are found in the Middle East. For instance, it began in India in the 19th Century where it was introduced by Sir Dietrich Brandis as a means of exploiting cheap labour of landless peasants in establishing plantations of economically valuable trees, especially teak (Tejwani, 1987). *Taungya* system, as it was referred to in India, would be used in integrating different types of crops with trees with time and this enhanced proper management of Indian forests (Amoah, 2009).

Apart from India, the policy was also practised in Indonesia where it was based on a contractual basis between the individual farmers and the forestry department (Siregor, 1990); the contract specified the area to be planted, the period of agricultural production and kind of crops to be planted. The policy, known as *Trumsupari* in Indonesia, was hailed to have enhanced tree establishment by alleviating illegal logging and in the long run ensured proper management of Indonesian forests besides raising the economic status of family members (Karksubrata, 1986).

On the regional front, the shamba system practices found root in South Africa where the British instituted major forestry reforms in Transvaal and Orange Free State in the 19th century (Brett &

Kruger, 2015). This policy received considerable attention from the reconstruction leaders such as Alfred Milner, the South African High Commissioner. Subsequently, it played a key role in increasing forest establishment especially when the forestry department was combined with department of agriculture. This study, nevertheless, fell short of espousing the economic changes that were witnessed following forestry reforms in South Africa where the forest department was merged with the department of agriculture (Bret & Kruger, 2015). Shamba system being a foreign system of forest management definitely was expected to bring about economic change by introduction of new methods of forest and crop tendering. This would transform pre- capitalist production that was purely subsistence to large scale production. Hence markets would be established for selling excess produce.

In Ghana, the shamba system was introduced as a Siviculture mechanism in the year 1928 in a bid to improve forest reserves in terms of tree establishment and improving the economic well-being of the rural poor by availing free land for cultivation (Amoah, 2009). The Success of the policy was witnessed in Brimso Forest Reserve where tree establishment was ranked high and as the best by the Ghanaian Forest Department in the year 1991. Consequently, the policy economically empowered the farmers (Bret & Kruger, 2015). In terms of management, modification programmes were put in place and the farmer put at the center stage in the management of the policy whereby the government offered only extension services (Amoah, 2009). While extension services were acknowledged to have been provided in the Ghanaian case, extension services and other new technologies in agriculture and forest management formed a knowledge gap on the effect of the shamba system in accentuating economic change.

On the other hand, studies by Tania (2007) and Ayana (2014) in Southern Cape and Ethiopia, respectively, concur that the shamba system was designed by local people interactively in the

forest departments to shape forest resource use and management. In turn, this influenced their livelihood strategies. In the Ethiopian case, Ayana (2007) quips that the country has faced multiple challenges in forest governance and environmental resources for a long time. After various regimes of forest governance failure, in the year 1991, a new regime came into power and adopted a decentralized federal policy and a democratic political process. Decentralization of state forests has enhance multi-agency in forest governance reform with the shamba system policy being adopted which contributed to an increase in tree plantation. It is worth recognizing the fact that the shamba system did not operate in a vacuum. It relied on subsidiary legislations for its operationalization. While Ethiopia adopted conservationist policies in forest management which is people centered hence contributing to success of the shamba system in terms of increase in afforestation, Kenya adopted preservationist policies. The discourse between ‘Conservationist and Preservationist approaches in Forest Law Formulation’ is succinctly articulated by Kariuki (2013) who assessed the effects of sessional paper no 1 of 1981 and 1986 which led to further forest encroachments. This study found that the shamba system had a negative effect on the management of Koderia forest especially from the year 1981 due to the nature of policies that were formulated that led to illegal logging.

In East Africa, Uganda, which also embraced the policy, admitted that it provided employment opportunities to many Ugandans alongside being a cheaper method of tree establishment (Muchangi, 2011). In Kenya, the Shamba system was introduced in the year 1910 to help address afforestation programmes by the colonial government (Oduol, 1986). The policy was practised in various forests in Kenya such as Mau, Mount Kenya, Ndundori Gathiriu as a tool for forest development and communal empowerment, where tea was grown alongside trees (Sinange, 2012). It succeeded in Gathiriu and Uasin-Gishu forest areas whereby an increase in afforestation

was noticed because management of the forests was people centered and forest plots were allocated to the residents without charging levies (Mwatika, 2013; Achungo, 2015). However, the Shamba system policy failed to stand the test of time in most forests in post - colonial Kenya. Environmental activists attributed forest plundering in Kenya to the shamba system (Wangari, 2009). For instance, Mau forest has lost huge chunks of forest block due to excision to pave way for human settlement in a bid to settle the Ogiek but later through corruption, many encroached the forest thus tampering with tree establishment. Retrospectively, Koderia forest lost huge chunks of forest land to illegal logging concessions and together with Mau and other forests, were part of the Grand Coalition government's agenda on conservation of 2008-2012 (Wafula 2010; Otieno 2011). In contrast to Mau forest and Kakamega forests that are a tourist attraction sites, Koderia forest benefited the locals through shamba system as an incentive from forest restoration for some time whereby they grew maize and beans. However, studies by Mukodo (2012) revealed that poverty levels, inadequate finance and poor implementation of forest conservation measures are a threat to Koderia forest. The current study sought to take this debate further by not only analyzing the challenges that have affected Koderia forest but also to investigate the effect of shamba system of forest management in the restoration of forests.

With forest challenges gaining momentum in post –colonial Kenya, a period of forest exploitation was ushered known as Environmental forestry era which commenced as from the year 1980. According to Reidar (2003), this period witnessed considerable timber exploitation without planting. Studies on the effect of environmental forestry era has been undertaken by: Reidar (2003), Klopp (2012) and Shazia (2014). These scholars concur that Environmental forestry era threatened the survival of indigenous people besides degrading forests. They further quip that politicians continued to wield control over forests as rent-seeking opportunities. The

current study sought to further investigate the effect of shamba system of forest management during the environmental forestry era.

Contemporary historical forestry studies in Kenya have been undertaken by a number of scholars notably: Ofcansky (1984), Anderson (2002), Otieno (2008), Corbetts (2009) and Fastone (2016). These scholars concur that the shamba system succeeded in establishing plantations in the colonial period. However, in the post- colonial dispensation, they describe the shamba system as a phenomenon that had a turbulent post –colonial history which Ofcansky (1984) in a bid to contextualize forest challenges both in colonial and post –colonial Kenya attributes to proliferation of politics and executive orders in forest management without the consent of environmentalists. They finally depict the shamba system as an area that is unexplored in Kenya’s historiography. The current study, therefore, sought to describe the history of forests in Kenya with a view to describing the evolution of forests and the adoption of the shamba system in Koderia forest.

On a different note, studies on economic history have been undertaken by Ndege (1987), Onduru (1992: 2009), Amatsimbi (1993) and Cokumu (2001). While these scholars similarly articulated modes of production theory in describing how the colonial state transformed the indigeneous agriculture, road and local entrepreneurship, the current study delved into articulating the modes of production theory in the transformation of forestry as a mode of production through the adoption of the shamba system. These scholars, nonetheless, posit that the colonial state incorporated various regions into capitalism through political contests establishment of repressive administrations. They enumerated the following aspects that instigated economic change: development of colonial agriculture, development of commodity production especially hides and skins of animals, migrant labour, development of roads and

markets and finally entrepreneurship. While it is evident that the colonial government established various forests through the shamba system which consequently instigated economic change by introducing timber trade in Koderia forest, studies on economic change by Ndege (1987), Onduru (1992:2009) Amatsimbi (1993) and Cokumu (2001) addressed factors that instigated economic change in agriculture and commodity production generally but did not focus on forestry.

1.2 Statement of the Problem

Studies in forest history have depicted the shamba system as an area that has remained unexplored in Kenya's history. Most of them have focused on contests and negotiations that engulfed forestry in the colonial period and the evolution of forest policies. The current study was premised on investigating the evolution of forest policies and the adoption of the shamba system of forest management and economic change. While studies have shown that the shamba system succeeded in putting up forest plantations leading to the rise of timber trade, studies on Economic Change have not appraised the shamba system as a phenomenon that instigated economic change so far. The governments persistently applied the policy in Koderia forest in spite of the challenges it has faced. This study therefore addressed the continued degradation of Koderia forest through illegal logging while examining the effect of shamba system in forest management.

1.3 Research Questions

- (i) What were the factors that influenced the evolution of forests in Kenya and the adoption of the shamba system in Koderia forest between the years 1957-2012?
- (ii) Which aspects of the economy have changed following the application of the shamba system policy in Koderia forest between the years 1957-2012?

(iii)What were the effects of the shamba system of forest management on the management of Koder forest 1957- 2012?

1.4 Objectives of the Study

The study aimed at examining Shamba system of forest management and economic change in Koder, Homabay County, 1957-2012.

The specific objectives were:

- (i) To account for the evolution of forests in Kenya and the adoption of the shamba system in Koder forest between the years 1957-2012.
- (ii) To describe the economic aspects that changed following the application of the shamba system in Koder forest since the year 1957-2012.
- (iii) To examine the effects of the shamba system of forest management on the management of Koder forest between the years 1957-2012.

1.5 Scope and Delimitation of the Study

The study focused on shamba system of forest management and economic change in Koder, Homabay, 1957-2012 as guided by the articulation of modes of production by Ray (1977), Pee (1980) and Berman (1985). As much as the shamba system commenced in the year 1910, this study adopted the year 1957 because it is the year in which the first official forest policy that is known as the White Paper of 1957 was formulated. It also marked the commencement of Scientific Ascendancy era in forest management in Kenya which saw the changes in forest policy that evolved from defence to economic avenues such as creation of employment. On the other hand, the year 2012 marked the commencement of a modified shamba system in Koder forest known as PELIS (Plant Establishment and Livelihood Scheme) that started to operate in most forests as from the year 2012. This modification was occasioned by continued loss of forest cover, increasing poverty and the continued view of communities around forests that forests

existed for 'public good'. This was also informed by the changing global trends in forest management from exclusion to participatory management (Achungo, 2015). The study covered all the three locations where sampled populations were subjected for interviews.

1.6 Justification and Significance of the Study

Studies on history of forests by Fastone (2016), Corbetts (2009), Otieno (2008) and Anderson (2002) contend that the shamba system is a phenomenon that had a turbulent post-colonial history with its adoption involving contests and negotiations among various stakeholders. The current study delved into the evolution of forest policies in Kenya and the adoption of the policy in the colonial period and in the 'turbulent' forest history in post-colonial Kenya. On the other hand, while studies such as by Ndege (1987), Onduru (1992) Amatsimbi (1993) and Cokumu (2001) have unraveled various forces that instigated economic change in various regions during the colonial period such as development of roads, markets, agriculture and migrant labour that witnessed changes in social roles whereby women were left behind while men went to look for jobs in towns, the current study identified the shamba system as a theme that instigated economic change in Koderia forest and contrary to changes in social role as articulated by economic historians such as Ndege (1987). In the shamba system, there were no changes in social roles as both gender were involved in the shamba system practices either as full time employees of the forest department or as farmers. This study is significant because the continued degradation of Koderia forest through illegal logging calls for concerted efforts by policy makers, ordinary citizens and researchers. This study is therefore significant because it supplements the body of literature first, on economic history by revealing that migrant labour in the forest department involved both gender in contrast to previous studies where women were relegated as home managers as men went for migrant labour. Secondly, this study added to the

body of literature on environmental history which as Carruthers (2004) notes, has attracted little scholarly interest in spite of the field of environmental history emerging in the 1960s to contextualize and historicize environmental issues to improve human environment and justice for connecting with sustainability and environmental equity by recommending the adoption of the policy in forest management besides revealing that plant transfer which characterized the shamba system during the colonial period formed a wider imperial scheme to colonize Africans together with their plants.

1.7 Theoretical Framework

The study employed the theory of articulation of modes of production. Ray (1977) asserts that the originator of the articulation of modes of production is Karl Marx (1818-1883). He used this theory in much of his literature regarding the Global South and the relationship between the pre-capitalist and capitalist economic structures. The theory has been further articulated by Ray (1977), Pee (1980) and Berman (1985). A mode of production involves two components: First forces of production which includes technology, labour and raw materials. It is defined as mode of appropriation of nature. The second component is the relation of production; the way in which surplus is extracted and distributed. The main argument of this theoretical framework is that, when the capitalist mode of production is introduced in a non- capitalist mode of production or pre-capitalist social formation, it does not immediately and automatically displace the existing modes of production. Instead, the capitalist mode of production will gradually align with the non-capitalist modes of production and use them for its own advantage. When the capitalist mode of production has been gradually established, it begins a process of: modification, destruction, marginalization and finally insubordination of the modes of production by utilizing

them. The continuous process of subordination culminates in the domination of the capitalist mode of production over the non- capitalist modes (Berman, 1985).

Pee (1980) notes that the articulation of modes of production theory is relevant to the understanding of the dynamics of change. It is also an effort to grasp the way in which capitalism preserves and exploits the preceding modes of production particularly within its reach. The tension in the articulation situation lies in the fact that, while trying to preserve the preceding modes of production, the capitalist sector cannot help but introduce new relations of production. The articulation of the modes of production raises instructive questions related to varied ways in which different patterns of production combine in a real setting. On the contrary, the old relations of production were used for further expansion of capitalism. It is precisely due to the continuing coercion of the producing community that specific forms of capitalist exploitation was possible.

Studies by Ray (1977) that have adopted the use of articulation of modes of production in agriculture in a bid to contextualize the rise of capitalism gives three sequential steps in the articulation of capitalist and pre- capitalist modes of production. In the initial stage, the local agriculture and handicraft production exists side by side with commercial farming and manufacturing. In this stage, the destruction of a farmer is only partial, non-capitalist modes remain dominant, while capitalism generates transitional forms. The second stage includes the development of large scale industry which demolishes most of the vestiges of the domestic modes of production while restructuring the local farmers as full time commodity producers. However, the social relations of modes of production in the agriculture branch remain essentially non- capitalistic. Both wage labour and technical composition of capital remain underdeveloped. Non- capital work force is preserved. Moreover, by use of coercive work force by the elite class

a reserve army of workers is created without significant expenses for its reproduction. The political link between elites and urban bourgeoisie allow for the establishment of low wages. The final stage entails massive entry of capital into agriculture through economic antagonism. Here, local agriculture is demolished thereby creating rural proletariat who are displaced from ownership of the means of production. Commodity production is currently the only remaining form of production.

1.8 Relevance of Articulation of Modes of Production Theory in the Study of Historical and Economic Impact of the Shamba System of Forest Management in Koder Forest, 1975-2012

The following tenets of the theory were applied in this study: Modes of production included shamba system as a form of technology in forest management, others entailed labour, land and raw materials such as seedlings. On the other hand, the forces of production included benchmark exercises that were organized by the forest department to mobilize labour and train them for efficient shamba system application. Colonialism arrived in Koder forest and consequently, in the year 1957, shamba system was established in an area whereby before their arrival, forests were held on communal basis. Their arrival transformed forest ownership from public to private tenure system. A new system of forest management (shamba system) was thus introduced. However, the colonialists still allowed Africans to undertake some of the traditional cultural practices in the forest besides hunting and sourcing herbal medicine from the forest. This was done by the colonialists in order to create a good rapport with the residents.

Having established the shamba system in Koder forest, the colonialists felt that for its successful application, certain modifications were needed on the policy. Benchmark exercise was organized in Kitale and Trans Nzoia forest zones after which participants were expected to apply

whatever they had learnt in Koderia forest. This included construction and how to plant in seed beds. After modifications, the imperialists embarked on curtailing the freedom of movement of residents into the forest. For instance, grazing of animals in the forest was banned. This threatened the cattle economy and subsequently elicited protests from the residents. However, they were convinced by being allocated forest plots where they could conduct agriculture. This is examined by Otieno (2008) whose evaluation of the state of forestry in Kenya in the year 1940 - 1990 revealed that the institution is engulfed in a series of contests and negotiations. Moreover, marginalization was experienced in terms of employment whereby Africans were restricted to lower cadres such as forest guards, nursery attendants and headmen while Europeans held administrative positions such as foresters, conservators and assistant conservators. Finally, it is worth recognizing that the capitalist mode of production was unsubordinated with ownership of all forest land being at the behest of the crown. Stringent measures were put in place that denied Africans access to forest land. This continuous domination was characterized by various legislative frameworks such as the White Paper of 1957 which emphasized on conservation and management of forest resources on government land. It was revised in the year 1968 to adequately recognize or reflect the role, rights or responsibilities of communities living adjacent forests (Mathu, 2007).

Nevertheless, the shamba system witnessed economic changes for instance: there was introduction of new farm tools such as rakes and jembes, introduction of new tree species and seedlings. For instance, various species of eucalyptus, introduction of new breeds of crops and new planting technology. Earlier, Koderia people employed broadcasting method but planting of seedlings on straight lines was later introduced. The intensification of timber trade opened up new market frontiers where seedlings and timber were sold, including Lidha market, Dol-

Kodera, Magungu and Karogo. New farm tools facilitated large scale farming for Africans. This contributed to sufficient capital hence they could pay school fees for their children. Apart from that, the shamba system contributed to migrant labour. People migrated from as far as Suba, Kisii and Karachuonyo to seek jobs in Kodera forest which they preferred at the moment than going to Kericho to work in the tea plantations. It is worth noting that, in the post-colonial period, the role of colonialists was taken over by the post- colonial governments.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of literature by scholars in the area of the shamba system of forest management and economic change. The aim of the chapter was to explore knowledge gaps that informed this study. This review was thematically undertaken in line with the objectives of this study. First, it provides an overview of the background of the evolution of forestry and the adoption of the shamba system, addresses economic change and the effects of the shamba system of forest management in Koderia forest.

2.2 The Evolution and application of the shamba system in Koderia forest, 1957-2012

In an attempt to investigate the factors that have called for the application of the shamba system over time in Kenya, a number of literature were reviewed. For instance, studies by Otieno (2008) on forest politics in colonial and post-colonial Kenya using Kisian and Maragoli as case studies, unravel the fact that there has been demand for forest user rights since colonial times. This saw individuals and groups form social networks in order to bargain and contest for rights over preserved landscapes. These networks led to contests and negotiations between these individuals and the forest department. These networks and negotiations were thus significant in examining the introduction of the shamba system in Koderia forest.

Besides the above revelations from Otieno (2008) on contest and negotiations in Kisian and Maragoli forest, another historical forest study by Fastone (2016) in Kenya attests to the fact that the shamba system is an area of study that has not been fully explored in Kenya's colonial historiography. The study reveals that the shamba system has been at the heart of forestry in Kenya and is extremely significant in forest establishment having succeeded in India. Its success in India consequently made the British to deploy this form of agroforestry in colonial Africa.

Findings from the study revealed that the shamba system provided numerous opportunities to the Kikuyu in central Kenya as they were able to farm and it was a key pillar of forest development in the 1950s in Kenya. The study further demonstrated how the colonial state employed indirect rule; a system that elevated African elites to mobilize labour for application of the shamba system. This provided a basis for understanding the rise of Chief Gideon Magak and how he mobilized labour for the application of the shamba system in Koderia forest. However, the study fell short of demonstrating the economic changes that were witnessed following the application of the shamba system.

Anderson's (2002) thesis on politics of ecology in Lembus forest in Baringo revealed that financial success of forestry in India provided an impetus for the conservationists' strategies to advance the same policy in colonial Kenya. The study confirms that the shamba system was successfully applied in colonial Kenya. However, in the post-colonial period, the policy had a long and turbulent history. This study was significant in analyzing factors that hindered the successful application of the shamba system in Koderia forest in the post-colonial period.

On the other hand, destruction of forests and forest conflicts is not a new issue in Kenyan history. It is a problem that has been experienced right from the colonial period even after the formulation of the first forest policy in the year 1957. Sheail (2002) advances the argument that the colonial government adopted both legislative and practical steps from the year 1916 to expand and protect forests; starting with the British forests. The British heavily relied on timber for export in line with this, the study recommended that there was need to evaluate alternative ways of ensuring access to timber for the British market. This study was, nevertheless, significant for this study because it was of great interest to assess the extent to which the timber trade influenced the application of the shamba system in Koderia forest.

Legal environmental studies have found that the ideal tenure regime to realize sustainable forest management is yet to be identified (Kamau,2012) .This is mainly due to conflicting interest in the multiple functions, services and benefits that forests and trees provide to mankind. Diversity of interests in forest management has brought a concept known as forest tenure that includes ownership and other arrangements for the use of forests. These need recognition because of the increase in deforestation that leads to loss of biodiversity. He contextualized land use conflicts that have been prevalent in forests to be a product of competing needs by different forest users such as forest dwellers, cultivators and conservationists. This has dichotomized forest use into: use of land for forests and use of land for other purposes. He summarizes his study by concluding that conservation efforts must be reconciled with the protection of community land tenure as they may weaken the land claims of forest communities. Of interest to this study was the role of land and forest tenure phenomenon in influencing the application of the shamba system in Koderia forest that also faces squatter problems.

In a bid to contextualize the concept of participation, Macharia (2015) quips that the concept originally grew out of criticism of the mainstream development projects of the 1960s and 1970s where critics asked why development projects often did not lead to the expected results and concluded that the problem was ‘citizen participation’. Too many projects, as it was observed, were designed and implemented without debate and co-operation with people whose lives were to be transformed by the same projects. To this end, the Forest Act 2005 provided for the introduction of PMF. Expectations were that local communities would participate in conservation, protection and management of particular forest areas. In return, they were entitled to a range of user rights such as firewood, timber, and land for farming.

By examining the Forest Act 2005 and 2007, the outcome justified the application of the shamba system in Koderia forest. Studies that have been undertaken on the role of law on conservation of forests have aptly demonstrated that state ownership has been the cause of depletion of forest resources by communities neighboring forests as the search for agricultural land and fuel wood progresses (Mathu, 2007). Forest resources are viewed by local people as wastelands which can be exploited as a common resource. In this respect, the future of the forest resource is inextricably tied to the future of the local population, and conservation of forests depends on the sustainability of local livelihoods. It is therefore necessary to focus on human issues as part of any sustainable management and conservation strategies because, without attending to human need, regulation will not be an effective mechanism for sustainably managing and conserving forest resources. It is also important to note that benefit sharing to affected communities are implemented. This view holds that state ownership is to blame for destruction of forests and not the shamba system. The role of the state in destruction of communal forests, if any, therefore needs to be ascertained.

2.3 Economic change and the shamba system interlude in Koderia forest 1957 -2012

Studies on economic change have been undertaken by a number of scholars. However, for this study the following studies were reviewed: Zeleza (1990), Ndege (1987) Amatsimbi, (1993), Wanyoike (1991), Onduru (1992; 2009), and Cokumu (2001).The scholars above contend that change is the essence of every human society and is therefore the primary object of historical inquiry. As man struggles to satisfy his needs for material existence through production, he interacts with nature and transforms it. Man's mode of economic existence is also manifested as he adapts himself and his institutions to the changing environment. Change also occurs when one community, existing in a different life, interacts with another. Besides that, the above scholars also hold that this is what happened when different communities came into contact with each

other over past centuries and also when they came into contact with colonialism. It would be interesting to know how people interacted with and conserved their forest environments for instance, the Luo. Nevertheless, aspects of production were transformed and people incorporated into the world capitalist economy.

For instance, Zeleza (1990) examined the major economic changes both in terms of policy and performance by reviewing various sessional papers and development plans in the period 1989-1993. He analyzed the agricultural sector, industry and commerce and posited that economic changes were accompanied by far reaching changes in social class formation. He gives a detailed summary of the problems bedeviling Kenya's economy with unemployment being top of the list. This work was beneficial to this study in that it helped in tracing economic changes in Kenya since independence. However, it did not appreciate forests and shamba system policy as phenomena that accentuated economic change which the current study undertook.

Other arguments promote the narrative that during the colonial period, there was a shift from pre-capitalist to capitalist modes of production. This shift did not occur due to internal dynamics of the society but was imposed by the colonial government. Moreover, the colonial government used its political machinery to integrate the indigenous economy into the world economy. In Kano, economic change occurred when crop production replaced cattle keeping economy as a means of production (Onduru, 1992). This study was significant to the current one in that it displayed various aspects of the economy that changed as a result of imposition of British rule in Kenya that provided a bedrock for the same study in Koderia forest. Nevertheless, the study fell short of examining how the economy of Kano changed through the application of forest policies in the region.

Onduru (2009) reports that South Nyanza was transformed during the colonial and pre-colonial period. Economic changes were necessitated by the outbreak of cattle epidemics which forced various households to shift from the cattle economy to crop production. He asserts that the shift in economic change was facilitated by the migration of some households from the lake shores to high grounds which were more favourable to agricultural production. This study, just like other case studies on economic change, provided a wider scope of analyzing and articulating the process of economic change. The current study benefited from the articulation of modes of production theory in its discussion and applied them in the study of the shamba system of forest management.

Cokumu (2001) contends that, prior to colonial establishment, the people of Siaya had an efficient, self-sustaining and dynamic agricultural system. He argues that colonialism played a pivotal role in incorporating agriculture in Siaya into the colonial capitalist economy. In this case, commodity production, wage labour and markets developed and by large, extended. Ultimately, indigenous agriculture was dissolved and restructured. By transforming forestry through the introduction of shamba system, new methods of tendering trees and crops were introduced which led to significant economic changes. The current study, however, delved into examining how colonialism transformed Koderia forest from 'traditional' to 'modern' forms of management, first by introducing private property land holding system which hitherto were public. Secondly, Koderia forest was transformed from traditional modes of management to the shamba system mode of management.

Studies on economic transformation in Tiriki 1902-1963 show that colonialism transformed the pre-colonial Tiriki community, their economic structures and organization. Among the notable changes that the colonial government exerted on the Tiriki into entailed seeking work in

European farms. Demand for taxes also forced the Tiriki into the labour market with the establishment and elaboration of the money currency that opened avenues for trade (Amatsimbi, 1993). This study basically was significant to the current study even though transformation of forest policies as an aspect of economic change was not a core discussion in his analysis. Nonetheless, the scholar introduced an aspect of economic change; namely migrant labour that triggered an economic shift among the Tiriki people just like any other region in Kenya where women took charge as home managers as men went to seek jobs in towns. In contrast to these studies, migrant labour in Kodera forest involved both gender as men and women went to the forest for either informal employment as farmers or got formal employment by the forest department. Africans' economic status changed because of the wages that they were paid. This helped them pay school fees for their children. The fringe benefits such as owning plots for farming made them guard the forest from plundering.

Ndege (1987) exposes the fact that, during the colonial period, the colonial state played a pivotal role in incorporating the Kasipul and Kabondo economy into world capitalism. It did this through political contests and by establishing repressive administrations using colonial chiefs. These aspects instigated economic change in Kasipul and Kabondo. They included introduction of taxation that transformed the pre-capitalist societal formation of Kasipul and Kabondo, development of colonial agriculture, development of commodity production especially from hides and skins of animals, migrant labour, and development of roads, markets, entrepreneurship and migrant labour. These have been exhaustively discussed by economic historians and scholars in their various research. In spite of Kodera forest being located in Kasipul, Ndege's thesis to some extent, acknowledges that colonial administration established mechanisms of environmental conservation through the Local Native Councils that included forests. This was an

important case study for this research in that it helped in unearthing colonial conquest and acquisition of Koder forest and land alienation. However, the current study went beyond colonial conquests and established mechanisms by the colonial government that were geared towards environmental conservation to delve into how forestry instigated economic change through shamba system.

Studies by Wanyoike (1991) conclude that the growth of Karatina town was exacerbated by two major factors. First is the location of Karatina in an agriculturally viable area and secondly, the railway line that catalysed economic change in Karatina. While his study set out to examine economic change in Mathira Division in Nyeri, the study attributed the growth of Karatina to viable agriculture and railway. Of interest to the current study was how the shamba system instigated economic change. This nexus missed in the Mathira division case study which holds various forest zones such as Gathiriu forest where the shamba system was practised.

2.4 Effect of the shamba system management on Koder Forest (1957-2012)

Much of the existing literature on the shamba system has tended to explore the effect of the shamba policy on livelihoods but not of forest management as an institution. Notwithstanding the success of shamba system in the colonial era, the policy failed to in afforestation programmes in the environmental forestry era. Literature that were reviewed therefore were geared towards establishing the effect of the shamba system on the management forests both in the scientific ascendancy era, 1957-1980 and environmental forestry era, as from 1980.

Environmental studies by Tania (2007) and Ayana (2014) in Southern Cape and Ethiopia respectively concur that the shamba system was designed by local people interactively in the forest departments to shape forest resource use and management. In turn, this influenced their

livelihood strategies. In the Ethiopian case, it had faced multiple challenges in forest governance and environmental resources for a long time. This state of affairs was witnessed by regimes of forest governance failure. In the year 1991, however, a new regime came to power and adopted a decentralized federal policy and a democratic political process. Decentralization of state forests exacerbated multi-agency reforms in forest governance with the shamba system policy being adopted which contributed to an increase in tree planting. While Ethiopia adopted conservationist policies in forest management which is people centered hence contributing to success of the shamba system in terms of increase in afforestation, Kenya adopted preservationist policies. This study found that the shamba system had a negative effect in the management of Koder forest especially as from the year 1981 due to the nature of policies that were formulated which exacerbated encroachment in forests.

In contrast to the Ethiopian and Southern Cape forests, Gebremichael (2016) examines the history of discourse of Kachung forest in Uganda and summarizes the problems that are associated with the forest as follows: People living in Kachung forest have been prevented from using forest resources for their livelihoods. This was followed by resistance from forest communities in the form of encroachment, setting fire on parts of the forest and mounting pressure towards the forest department. The study blamed the afforestation programmes that had taken place with little knowledge of the forest history and value for local communities. The study finally concluded that successful afforestation can only be achieved with prior knowledge of land use history and by consulting local communities through a participatory approach to forest management. Since the shamba system, emerged out of the broader concept of participatory approach to forest management, this study was significant in promoting understanding of new knowledge in the participatory approach to forest management. This is because in a bid to merge

the locals understanding of forest and land use with shamba system practices in Koderia forest, consultations and benchmarks were organized in Kitale and Trans Nzoia as established in our study.

Similarly, to the above reviewed cases, studies by Kimani (2009) show that shamba system allows food production by landless farmers and adds to their per capita income. Although the scholar notes that the study was not able to account for all the services and products provided by forests, the analysis of the study indicate higher economic than financial net benefit as expected. The incremental benefits were positive and a sensitivity analysis showed no change in the sign of the net incremental benefits. The study recommended participation of farmers through incentives in management of the reforestation exercise. Besides, the study recommended that the government should increase the number of forest guards per forest station, to hold capacity building *barazas* on the shamba system guidelines and to allocate some acreage to planting indigenous trees under the Shamba system. This study was not only beneficial for providing a basis for analysis of effects of the shamba system on forest management but was crucial in understanding the challenges that affected forests in Kenya especially in the post- colonial era where corruption emerged as a hindrance to forest restoration.

Comparative to environmental studies, legal environmental studies have found that the current conservation law is based mainly on an anthropocentric philosophy (Chebii, 2015). This means that natural resources are exploited for the benefit of mankind. The studies nonetheless advocate that sustainable management of Kenya's forest resources must involve cultural, economic and ecological challenges posed by increased population. The study finally acknowledges the importance of law in controlling land use in agriculture and forestry generally. This study enriched the current study in that, while it broadly focused on the role of forest laws in

conservation, the current study narrowed down to the role of the shamba system in the management of Koderia forest with findings showing that the nature of subsidiary laws that were formulated in the post-colonial period in the implementation of the shamba system exacerbated forest plundering. For instance, National food policy of 1981 and the Economic empowerment policy of 1986 led to an increase in forest encroachment (GoK, 1981).

Meanwhile, historical studies on forest policies have been undertaken by a number of scholars such as Ofcansky (1984), Beinart (2000) and Corbetts (2009). Corbetts (2009) quips that colonial government, through their forest policies and administrative reforms had already redrawn the school and economic life of forest communities by formulating various forest policies. He notes that this was the desire of colonialists to transform African forests as a projection to achieving an imagined 'Eden'. The study by Corbetts (2009) was of immense value to us in that it unravels the colonial mentality behind forest policy formulation in what he terms as 'Green Imperialism'. However, the current study sought to specifically evaluate the effect of the shamba system (green imperialism) on forest management. It emerged that the outcome of Zuckerman Report of 1957 and the Scientific Ascendancy forestry era witnessed significant changes in colonial forest policy from defence policy to diversification of forests to create employment for effective management of forests.

Corbetts (2009) and Beinart (2000) allude to the narrative that colonial forest exploitation was transnational, extensive and capitalistic in contrast to pre-colonial demands. Their examination of forest policies in summary shows that colonial forest policies imposed severe restrictions on communities that previously had almost unrestricted access to forests. They further concur in their separate thesis that the shamba system provided opportunities to communities that engaged in the practice of the policy. However, their point of departure is an argument by Beinart (2000)

who notes that colonialists who came to Africa have engineered a debate on environmental issues intensely. He notes that historians have explored the environmental consequences of colonial incursions including appropriation of forests which was at the heart of European expansion from its very inception. This led to forest protections and afforestation which were pursued to ensure sustainable timber protection and extraction. He notes that analyzing colonial conservation has itself been a controversial issue. In particular, he asserts that conservationist discourse was geared towards changing African patterns of land use. Such policies and projects rooted in scientific logic remained central in the development strategies of the independent African states and international agencies. This study was significant in understanding the intent and effect of colonial environmental policies from a broader perspective. This was significant in recapitulating the effect of the shamba system in forest management.

Muchangi (2011) notes that the controversial shamba system may be good for Kenyan forests. According to the scholar; forests provide higher benefits to local populations and maintain higher levels of biodiversity when managed by the people. The shamba system involves landless communities in forest conservation by encouraging them to cultivate on previously cleared forests on condition that they tend their crops and take care of seedlings. This periodical captured the main aspiration of the study which was to describe the effect of the shamba system on forest management.

From a legal perspective, Kamau (2013) notes that there is a basis in international and regional legal instruments for the protection of the land rights of forest communities because there is sufficient ground for protecting forest communities. At the national level, the constitution has recognized community land and has defined it to include forests. The constitution has also recognized the fact that forest communities also have a right to exercise their culture such as

hunting and gathering in the forests. This study was significant in investigating the effect of this access to forest on the management of Koderia forest using the Forest Act 2005, Forest Act 2007 and Forest Act 2014 which all embraced the shamba system, (Wasike, 2018).

On the other hand, from a historical point of view, Ofcansky (1984) notes that, in the pre-colonial period, land management in forest areas was closely regulated. Around Mount Kenya forest for example, the Kikuyu and Embu which are both agricultural communities, had evolved a system of land management in which forest land was owned by clans, but only up to a maximum of two miles into the forest. Land above this cultivation line therefore belonged to the community. The forest is valuable in bringing new land into cultivation as a result of community consultation and consensus. This line of argument formed an important point of reference in assessing the effect of current land ownership on management of Koderia forest.

Forestry studies in Ghana show that *taungya* plantation system (equivalent to the shamba system in East Africa) based purely on technical ground and national economic criteria are bound to be unsuccessful, if the social and economic needs of the farmer are not incorporated. Failure of the *taungya* system has more negative impact on the environment and its biodiversity than even a fire incident (Amoah, 2009). Nevertheless, the *taungya* system has long been identified as one of the most important strategies required to meet the demands for wood and also it offered thousands of job opportunities to most Ghanaians. This study alludes to the notion that the shamba system policy does not only needs technical grounds and national economic policies to be successful. It needs more. This is why Mavhunga (2014), while studying hunting methods among the Shona in Zimbabwe, called for integration of both foreign and traditional laws to harness success. This discussion elicited a comparison of the same when it comes to forest

management, and the discussion was based on traditional modes of conservation and the nexus between them and the shamba system.

Yattick and Awiti (2007) have considered the shamba system as a “paralysis in policy reform and innovation”. They note that the shamba system is a manifestation of Kenya’s unpredictable policy context. The policy was seen as best approach of plant establishment since very little financial resources were used, but it has contributed to food security, afforestation among others. Politicians initially supported the policy and even replicated it in their regions. However, it later metamorphosed into a conduit for excising forest land and allocating to individuals. Politicians, in the name of landlessness, allocated forest land to their families and friends. In some cases, communities from outside the areas near forests were allocated land and the original beneficiaries driven out. Such irregularities created conflicts and hostilities between local communities, politicians and government personnel. As a result, farmers deliberately manipulated the performance of planted seedlings either de-barking or cutting the roots of sapling to ensure continued tenancy of the land for subsistence crop production. It was banned in 1985 but later the ban was lifted in 1993 and it coincided with the Environmental forestry era which commenced in 1980. This era witnessed the rise of civil society especially the Green Belt Movement which castigated the shamba system for exacerbating deforestation. This study was of great intellectual guidance to the current one in that it strived to provide an in-depth analysis of the challenges that have faced the shamba system in Kenya which leads to intense debate of the role of the shamba system in forest management between the civil society and researchers.

On the other hand, studies have shown that access to forests by communities surrounding forest areas has been restricted by government policies inherited from colonial powers which were preservationist in nature (Mbote, 2008). Competing land uses over forest lands for human

settlement, farming, industrial development, livelihood support for the forest dwellers as carbon sinks and water catchments threatened is a major source of conflict. This has impacted negatively on forest communities who traditionally had rights of access and control of forests, which existed even if land belonged to a different legal entity. There have been efforts by the government towards recognizing the rights of forest communities in Kenya through various forest legislations. This study investigated the effect of these forest legislations in forest management using the shamba system policy.

On the other hand, nuanced interpretation of challenges that have bedeviled forests in the environmental forestry era has been undertaken by a number of scholars. Environmental forestry era was witnessed by massive felling of trees without replanting which happened as from 1980, (Reidar, 2003). Reidar (2003), Klopp (2012) and Shazia (2014) contends that considerable felling of timber was witnessed without consummate planting. This threatened the survival of both indigenous people and severe degradation of environment. Their findings also concur that politicians wielded and controlled forests as rent-seeking opportunities. Shazia (2014) specifically notes that Mau forest surfaced as an issue of global political discourse in the year 2009 during the Copenhagen World Summit on climate change. The current study went beyond investigations of the challenges that affected forests in the environmental forestry era to further investigate the effect of environmental forestry era on shamba system of forest management.

Finally, Turnbull (2002) found that Spaniards recognized the medicinal value of the bark of cinchona trees during the colonization of Peru and Bolivia and by 1640, Cinchona bark was being used in Europe to manufacture quinine for combating malaria. Overexploitation of nature forest resulted in shortage of quinine and in 1850 steps were taken to cultivate cinchona in other parts of the world. Plantations of cinchona were thus established in India, Indonesia and Zaire

using the shamba system whereby farmers benefited from the food crops they cultivated and also from employment by establishing cinchona plantations. This literature from Spain was of immense value to our study in that it justified it as a study area which advocated for the application of the shamba system in forest management since the policy had succeeded in many regions of the world.

2.5 Conclusion

From the literature reviewed, the following conclusions were made. In regard to the first objective of study, it was found out that contests and negotiations have been extensively explored by a myriad of scholars. It was however concluded that evolution of forest policies and adoption of shamba system is still a rich academic enterprise that has not been explored. Secondly, extensive study on economic history has revealed various phenomena that instigated economic change in Kenya. However, a gap lies on forestry. This was the gap that the current study sought to fill. Finally studies on effect of shamba system has labored on the effect of the policy on livelihood provision but not of forest department. Besides that, forest management witnessed serious challenges during the environmental forestry era which has been addressed by quite a number of studies. However the current study went beyond these challenges to investigate further effect of environmental forestry era on shamba system of forest management.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the procedures that were used to conduct the study. It is organized into the following sub-headings: Introduction, research design, study area, sampling procedure and sample size selection, target population, methods of data collection, data analysis and ethical considerations.

3.2 Research Design

This study employed a Historical Descriptive Research Design. This was due to the historical and descriptive aspect of the study (Watson, 1994). Descriptive research was employed because information from the respondents regarding forest management was gathered by use of a questionnaire. On the other hand Historical design was employed in capturing events regarding forest evolution and management in pre- and post- colonial eras. The design was necessary for the study because historical evidence was obtained through scrutiny of archival, secondary and oral sources to ascertain their authenticity and validity. Besides, it enabled the researcher to employ non-probability sampling techniques such as purposive and snowballing which ensured an in-depth understanding of the phenomena under study. Various parameters were put in place to select respondents for this study to ensure that only those with understanding on the shamba system were selected for interview. Lastly, this design enabled the researcher to gather information from a large population as recommended by Watson (1994) and Nassiuma (2000) using FDGs, In-depth- interviews and Key informant interview guides while processing and analyzing such information qualitatively.

3.3 Study Area

This study was conducted in Koderia region of Rachuonyo South District in present Homa- Bay County. Koderia forest is located in Kasipul constituency. The choice of study area was informed by the continued degradation of Koderia forest through illegal logging in spite of the application and proscription of shamba system. The thematic area of study is environmental history. According to Carruthers (2004) environmental history is a field of study that deals with forestry and any other phenomena in the environment. The aim of environmental history is to contextualize and historicize environmental issues to improve human environment and justice. There are three major locations in Koderia area where this study was undertaken; Koderia central (Kadel -Kamidigo), Karabach (Koderia South) and Kamiyawa (Koderia North). Most of the residents are farmers. A greater percentage of these locations is under forest cover with Koderia forest now covering approximately 899 Ha in comparison to Wire that covers 399ha, Kakamega 200,000ha, Mau 273300ha, Gathiriu 527ha (Gok,2005). Koderia forest is located on latitude 00³³ N: 34⁰ 40 '0'E in OMS and experiences both hot and wet climate (GoK 2001). Business centers that this study captured included: Ombek, Dol (both along –Oyugis to Kisumu Road), Karogo trading center popularly known as Mogumo among the Abagusii (at the border between the Luos and the Abagusii). Other areas that this study included are Nyakiya and Magungu centers in Northern Koderia.

Koderia forest has an altitude of the area ranging from 1800mm to 2000mm basically in upper areas heading to Kisii to 1400mm to the lower side heading to Koderia North. Thousands of years of earth formations have resulted in hill rocks like God Agulu, Mititi, and rivers like Awach, Agido, Nyamache plus other small rivers that empty their waters into Lake Victoria. Rainfall averages and temperatures have been influenced by relief with rainfall ranging from 1800 with a

rainfall being experienced twice. The long rain starts as from March to end of June while short rains fall in September to December. Mean annual temperatures ranges from 13^o C to about 22^oC (GoK, 2001).

The soils in Koderia forest are well drained shallow, dark red and ranges from sandy to clay. The nature of soils and cool temperatures and have determined vegetation of the area (GoK, 2001). There is a combination of high dense forests with shrubs that continue to host wild game like monkeys in the forest. Several years of continuous land use by man and the deforestation of wild game have transformed the vegetation. It was this geographical background together with ecological features and diversity that influenced the economic activities and settlement of the people around Koderia forest in the 19th century (Ndege, 1987). There are two major rivers that pass through the forest namely Awach covering a catchment area of 566sq. k/m and Awach Nyamache with a catchment area of 568 sq. k/m. These rivers originate from Kisii region and drain into Lake Victoria. (KNA/Rachuonyo/DDP/1997-2001). The figure below is a pictorial representation of Koderia forest.

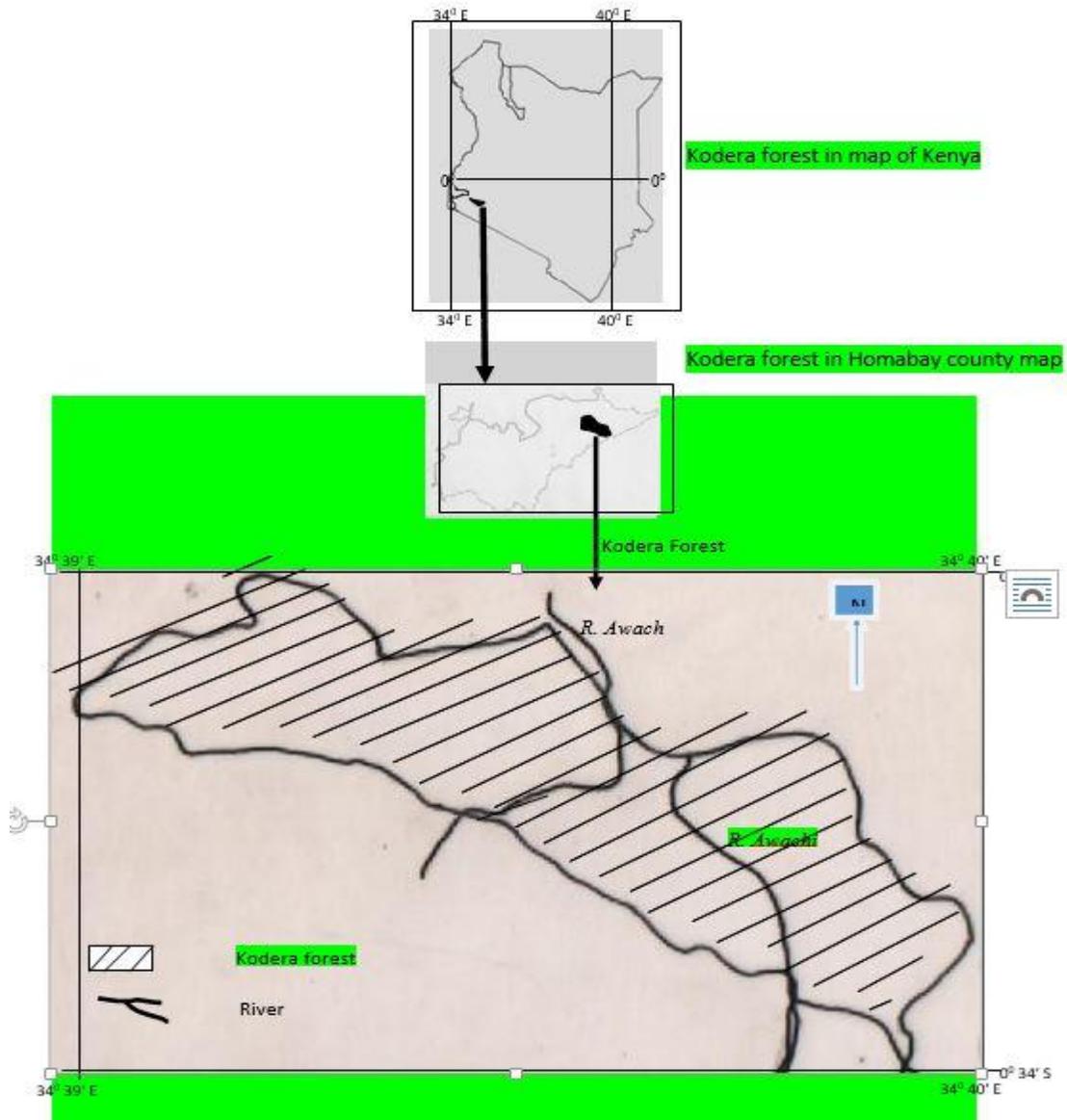


Figure 3.1: Map of Kodera Forest
Source: Maseno University Cartographer

3.4 Study Population

Table 3.1: Population of Koderá residents

Strata	Population	Foresters/managers	Totals
Koderá North	2346	1	2347
Koderá central/Kadel	3023	1	3024
Koderá south	2889	1	2890
Sub totals	8258	3	8261

Source: G.O.K (2009), Population of Koderá residents as per the 2009 census report

From the table 3.1 above, it can be inferred that Koderá region is divided into three locations/strata besides having three foresters as shown. The total population from which sample size was drawn from is 8261.

3.4.1 Sampling Procedure and Sample Size

Snowball sampling in the two population groups was employed because it was considered simple, most convenient and free of bias. Every member had an equal and independent chance of being selected as respondents. Sampling is a procedure of selecting a part of a population in which a research is to be carried out, which also ensures that conclusions from the study can be generalized to the entire population. Snowball sampling technique was further used to select the three foresters/managers to saturation point.

According to Nassiuma (2000), given that the target population is less than 10,000 hence to calculate the sample size, a sample size formula was used. According to this formula, in most surveys a coefficient of variation is the range of $21\% \leq 30\%$ and standard error in the range of $2\% \leq e \leq 5\%$ is usually accepted. Therefore, the study used a coefficient variation of 30% and a standard error of 2%. Nassiuma (2000) gives the formula as follows, $n = Nc^2 / c^2 + (N-1) e^2$

Where n=sample size, N=population c= covariance, e= standard error.

$$n=8258(0.3)^2/0.3^2+ (8258-1)0.02^2 = 219$$

By using the formula $\{n=Nc^2/c^2+ (N-1) e^2\}$ a sample of 219 was achieved. This was added to the three snowballed Foresters from the three locations to get to a sample of 222. The table below is a summary of the target population in each study area and a corresponding sample taken from each location. The study used Nassiuma (2000) formula for stratum sample size distribution; $Nh-(Nh/N) n=$ sample size for stratum, $h/Nh=$ population sample size for stratum, $h, N=$ size of population $n =$ total sample size . For instance, in Koder North $2346 \div (8258 \div 219) = 62 + 1$ forester gave a sample size of 63.

3.4.2 Sample Size per location

Table 3.2: Sample size per location.

Location	Number of residents	Sampled residents per location	Sampled foresters	Sample size
Koder North	2346	62	1	63
Koder Central/ Kadel	3023	80	1	81
Koder South	2889	77	1	78
Sub- Totals	8258	219	3	222

3.4.3 List of Informants from the Target Population

Study population was initially divided into three locations forming three clusters with a sample size of 222 respondents as shown in Table 3.2 above. Snowball sampling was further used to select respondents from the respective locations that was based on the sub-strata as depicted in

the table 3.3 below. This yielded a final sample size of 60 informants for the study. Farmers/ locals were represented by Community Forest Associations (CFAs) as depicted in Table 3.3 below.

Table 3.3: List of informants

Location	Chiefs	Ass. Chiefs	CFAs	Foresters	Nursery attendants	Village elders	Former councilors	Forest guards	Total sample size
Kodera North	1	1	10	1	4	1	1	1	60
Kodera central	1	1	10	1	4	1	1	1	
Kodera South	1	1	10	1	4	1	1	1	
Total	3	3	30	3	12	3	3	3	

3.5 Data Collection Methods

The study utilized both primary and secondary data. Primary data were gathered from the Kenya National Archives in Nairobi, KEFRI and also through interviews. In the field where oral accounts were gathered appointments were booked prior to the interviews. Informants were then identified using the following criteria: People who had worked in the forest department both in the colonial and post- colonial periods were selected for the study through snowballing method. Some of them took part in bench-marking exercises that were organized in Kitale and Trans-Nzoia on the shamba system practices and therefore were instrumental for this study in so far as the shamba system is concerned. Besides that, by virtue of working in the forest department, they possessed the necessary information regarding this study.

On the other hand, Respondents who had worked as colonial administrators in the colonial and post-colonial periods were also identified for this study through snowballing. These were agents of colonial administration and they took part in the implementation of forest policies. Thirdly,

those people who took part in the shamba system practices as farmers both in the colonial and post –colonial periods were also included in this study. This group was significant in addressing challenges and successes of the shamba system as actual implementers of the policy on the ground. They included community forest associations (CFAs). Finally the local leadership such as chiefs / assistant chiefs and the clergy were also engaged in the study. These were the people who interacted on a daily basis with the populace. They were thus able to enumerate the effect of the shamba system on the people.

Oral sources provided an inbuilt check system whereby certain respondents insisted that other individuals be interviewed on the same topic. They did this as aids to their memory or they considered them more knowledgeable on certain issues. Oral accounts helped in capturing the voices of the people on the ground because in most cases the discussions started informally. This made the respondent to open up their feelings on the state of the forest without fear. Oral sources yielded a total of 60 respondents that were categorized as shown in the table below:

Table 3.4 Information on Oral sources

Oral sources	Composition	Tool	Number interviewed
Key Informant Guide	Village elders, Former councilors, Chiefs/Ass. Chiefs	KII (Interview guide)	15
Indepth-interviewe Guide	Foresters, Nursery attendants and forest guards.	Indepth-interviewe guide)	15
FGDs	10 per location consisting of Men, Women and Youth	FDG guide	30
TOTAL			60

Oral information was gathered in Koderia forest between: January 2018- February 2019. Key informant and in-depth interview guides were used to collect data from sampled populations and its reliability was checked through reconnaissance. Lastly, focus group discussions comprising CFA (community forest association) members were identified through Snowballing as depicted in Table 3.4. They were subjected to discussions using an FGD guide. Such discussions were crucial in unearthing “rich” informants who knew how Koderia forest has evolved right from acquisition of the forest land to present. In order to take care of my respondents especially those who were not well conversant with English language, interviews were conducted in *dholuo* (the local language) then transcribed verbatim into English. During the interviews, suspicion emanated from the residents regarding my work in the area, consequently, I was able to convince them that I was purely conducting a research for my studies and not investigating anyone.

On the other hand, archival data were gathered from the National Archives in Nairobi and KEFRI (Kenya Forestry Research Institute) in Maseno in December 2017. At the National Archives in Nairobi the following reports were gathered: Provincial and district annual and quarterly reports, letters and correspondences touching on forest policies and management with the assistance of the Kenya National Archives officials. At KEFRI Maseno, the following were gathered: Forest department annual reports, forest orders, circulars, various publications and forest articles for the press. Archival data were subjected to internal scrutiny where they were authenticated and validated. Archival information proved to be crucial during oral discussions with the respondents in providing the chronology of events. On the other hand, secondary data were gathered from books, scholarly journals, theses, newspapers, policy papers and the internet through expert sampling.

3.6 Instruments of data collection

The following instruments were used for data collection: Key informant guide, in-depth interview guide and focus group discussion guide. Key informant guide was used in interviewing foresters and nursery attendants because of their vast knowledge in the shamba system policy. This tool was significant for interviewing these forest officials because they took part in subdivision of forest plots to farmers notwithstanding inspection of the shamba system policy therefore it provided supplementary data. On the other hand, in-depth interview guide was used in interviewing the former provincial administration (Chiefs and Assistant chiefs), councilors, and the clergy. This tool was significant in interviewing these people because they possessed vast knowledge in tracing the history of Koderu forest and the transition of the forest from pre-colonial to colonial management. It enables us to cover all diversities during interview which enriched this study. Lastly, three FGDs were conducted in the three locations comprising of ten people each who also happen to be members of community forest association (CFA). They were composed of men, women and youth. Because some of them could not understand English language, these -discussions were undertaken in *Dholuo* with voice recordings done and transcribed. CFAs represented the farmers (locals) who witnessed and felt the economic changes that took place as a result of the introduction of the shamba system. Moreover, they were the actual people who implemented the policy. The broad representation of FGDs enabled us to get diverse responses which enabled us to triangulate the findings.

3.7 Content validity

To ensure content validity of the research instruments, prepared instruments were evaluated by supervisors and corrections made according to the agreed recommendations. This ensured completeness of its evidence. On the other hand, validity of secondary data was ensured by

reviewing articles contents, examining the evidence espoused in the books and by examining the page's domain extension for internet sources.

3.8 Reliability

Reconnaissance was done in order to familiarize with the study area. The reconnaissance made it possible to identify reliable informants for this study. It also helped in applying the appropriate language for interview in particular areas.

3.9 Data Quality Control

A number of measures were put in place to ensure quality assurance principle is adhered to. Such measures included: Constant reviewing of research tools, participation in the selection of moderators especially in FGDs and finally interviewing people in the language they understood best.

3.10 Data Analysis and Presentation

The main documents which were identified from the archives include: provincial and district annual and quarterly reports that entailed forest policies and management. This was done with the assistance of the Kenya National Archives officials. Archival data were subjected to internal scrutiny where they were authenticated and validated. On the other hand, interviews that were conducted in the local dialect were recorded and transcribed verbatim into English. They were analyzed through content analysis in phases whereby the data were coded into themes and sub-themes. Both archival and oral data were corroborated with other secondary sources of information that were also analyzed through content analysis in line with the articulation of modes of production theoretical tenets. Triangulation was done to ascertain consistency of the findings. This aided by comparing the various sources of data that emanated from the archives, oral and secondary sources. Notable works that were of immense path breaking in analyzing

economic change included Ndege (1987) and Onduru (1992). Discussions were then initiated along the three variables of study and presentation of data was done in prose and tables and conclusions eventually made.

3.10.1 Ethical Considerations

Before conducting this research, ethical clearance was sought from Maseno University Ethics and Review Committee (MUERC). This facilitated the issuance of a permit from NACOSTI authorizing the researcher to carry out the research in Koderia forest. The researcher then booked appointments with the County Commissioner who introduced him to the Chiefs and the foresters. Informed consent was obtained before interviews and purpose of the study was discussed with the respondents. Confidentiality of the respondents was also adhered to during interviews by use of pseudonyms and voice recordings were only done with the respondents' consents. Questions were administered personally and feedback collected the same day. Debriefing of the informants was done by carrying out sessions at Awach where the findings of the study were shared to eliminate suspicion from the respondents that may have arisen during data collection. Other ethical considerations included the acknowledgement of various secondary works used in this study.

CHAPTER FOUR
THE EVOLUTION OF FOREST POLICIES IN KENYA AND THE ADOPTION OF
THE SHAMBA SYSTEM IN KODERA FOREST (1957-2012)

4.1 Introduction

An avalanche of studies notably Beinart (2000) have explored the environmental consequences of colonial incursion, including appropriation of forests. The major reason has emerged as sustainable timber protection and extraction. Others such as Mwangi (1998) and Ofcansky (1984) have sustained a discussion on forest management and governance during the pre-colonial, colonial and post- colonial epochs with success and challenges of each era. Lastly, there is a group of historians such as Anderson (2002), Otieno (2008), Corbetts (2009) and Fastone (2016). They describe the shamba system as a phenomenon that had a turbulent post –colonial history, unexplored in Kenya’s historiography and as a policy that was at the heart of forestry in Kenya in terms of afforestation.

In view of the shamba system development in various case studies, this chapter presents first and foremost, a history of forestry in Kenya. This was done with a view to establishing forms of management of Koder forest on the eve of adoption of the shamba system chiefly to demystify the narrative that Africans had neither forests nor conservation mechanisms prior to colonization as held by a myriad of studies from Eurocentric scholarship. This was subsequently followed by a discussion on colonialism and evolution of forest policies besides adoption of the shamba system, and finally lineage formation and adoption of the shamba system in the era of disease and insect invasion in Koder forest.

4.2 The history of forests in Kenya: Management and use of forests on the eve of the shamba system in 1957

Before anything else, human beings are referred to as biological entities as opined by Beinart (2000). Their interaction with other species and with the natural environment, and their appropriation of the natural resources without which life is impossible is a central element in history. In this regard, environmental concerns have necessitated the consideration of fascinating non-human agents in history such as fire, water, animals, insect, epidemics and plants and their invaders. In a bid to contextualize and debate these environmental factors, it has emerged that analyzing, for example, the evolution of forests and its conservation itself, has been a controversial issue. This is justified by the Green Belt Movement under Wangari Maathai who opposed the shamba system and attributed it to tree loss. This assertions occurred during the era of Environmental forestry in Kenya in 1980-1990s which saw forests harvesting done without planting (Wangari, 2009). This was in spite of research showing that the shamba system is still the best approach in forest establishment (Muchangi, 2011).

Before assessing the evolution of forest policies and the debates and controversies in the adoption of shamba the system, it was necessary to flash back briefly and examine the modes of forest conservation before the advent of the shamba system. This was done mainly for two reasons: First, there has been a misconception that, prior to imperialism and colonization, there were no established forests in Africa. Secondly, Africans contributed to destruction of forests through their cultural and economic practices, for instance, through shifting cultivation hence they have been depicted as mere recipients of conservation knowledge from the Metropole. Both conflicting sets of narratives were held by Arthur Hardinge in the year 1897 who sought to limit forest destruction in Kenya through a legislation of wood and forest regulation (Beinart 2000). The latter position of Hardinge on Africans being viewed as forest destructors is championed

further by Ofcansky's (1984) account of the development of forestry in Kenya who notes that African shifting cultivation and overgrazing caused large scale deforestation and soil erosion. However, he notes that ecological balance was achieved through occurrence of war, epidemics and famine. This is a pessimistic account that tended to view Africans as people who did not possess any knowledge in forest use and maintenance and it is refuted by Thrupp (1997) who asserts that those who suggest that African shifting cultivation is responsible for environmental destruction are relying on a myth. She notes that environmental impacts of shifting cultivation are diverse and depend on cultivation practices as well as socio-economic and ecological factors. Besides, she notes that field based study so far has revealed that shifting is not responsible for a majority of global deforestation. She notes:

'while the contribution of shifting agriculture to overall tropical deforestation is clearly an issue of concern , its magnitude in relation to other causes is sometimes put away out of proportion in aggregate figures for global deforestation which at be stare crude measures' (Thrupp, 1997),

A Key informant, Wilson in the year 2018 while in concurrence with Thrupp (1997) on Africans' possession of knowledge of forest use and establishment, gave an account which revealed that prior to colonialism, Africans managed and controlled their forests through their local leadership. According to him, colonialism introduced forest laws that drove Africans off their lands through excisions and by introducing title deeds, access to the forest was only guaranteed ostensibly through the shamba system. Ray (1977) and Berman (1985) observe that, in the initial stage of a capitalist society, local agriculture exists side by side with capitalistic vestiges which in this case was the shamba system. However, an FGD session held at Awach further revealed that, with time, access to Koderia forest was tightly controlled by forest guards and only shamba system activities were permitted. This decision systematically relegated traditional forest practices.

Apart from justifying that shifting cultivation was not responsible for forest destruction, another myth that this study sought to debunk was the narrative by Arthur Hardinge as quoted in Beinart (2000) that prior to imperialism and colonization, Africans had no established forests. This assertion sought to relegate the Center from forest establishment while giving prejudice to the Metropole as 'owners' of forests. However, evidence abounds that on the eve of conquest of African lands which was subsequently followed by the application of the shamba system, forests in Kenya were held through public tenure system by various communities for purposes of performing rituals, grazing and for fetching herbs (Kariuki 2013). Kariuki (2013) concurs with Mwangi (1998) that forests were managed by the local communities through the traditional resource management institutions in a non- capitalist mode. In a rejoinder to this debate which negates the claim that Africans were mere recipients in forest technology, Ray (1977) from his analysis of the nature of capitalism reiterates that the first stage of capitalism though championed by capitalism being dominant, capitalism in its essence generates transitional forms in this case undermining the existence of traditional forests. Koderia forest fits the description of the above scholars in terms of management on the eve of the adoption of the shamba system by first acknowledging that forests existed before and during the advent of colonization. Oral information in 2018 from Ongou and Ananga 2018 attest to the fact that the indigenous trees and forests in Koderia symbolized the institution of gods and spirits. Management of the forest was based on kinship and disputes were solved through negotiations. Clan and tribal wars were witnessed. A case in point is the war between the Abagusii of Wanjare and Kadel- Luo which were mostly solved through force (Maxon, 1989).

Advancing the narrative that Africans had forests before the imperial impulse is further exhibited by modes of forest use that were in place. Revelations by Muchaga (1998) attest to the fact that

the Isukha and the Idakho of Western Kenya first and foremost had forests. In those forests, there were trees that were identified as medicinal. Those trees were preserved through appropriate taboo system besides the existence of traditional laws relating to the ecology that were administered by elders. The contribution of those traditional African beliefs in ecological conservation, however, has been largely devalued by Eurocentric opinions notably Ofcansky (1984) and Crosby (1986). In an evaluation of tree and forest tenure system Mbote (2008) aptly demonstrated that the pattern of forest use was established on a clan basis. For instance, rights of cattle grazing and cultural practices was a decision of each and every clan depending on their proximity to the forest. Observations by Muchaga (1998) and Mbote (2008) on clan control of natural resources concurs with our findings from Koderia forest in 2018 whereby an elder, Aketch revealed that clan elders like *Del wuod Odera* controlled the allocation of land, forests, hunting and organized succession of the same forests. Furthermore he managed resources such as land on behalf of his clan to ensure sustainability.

Traditional forest use and appropriation were not applied without rules and regulations. Moreover, observations by Opanga (2008) reveal that clan elders enjoyed absolute powers over natural resources and they used force to ensure that these customary policies are followed to the letter. There has been a contest over the role and existence of customary policies in forest conservation. On the one hand Mwangi (1998), Castro (1990), Odera (2004) and Gebremichael (2016), have heralded the existence of customary policies in forest management. For instance, in Kachung forest in Uganda, it has been discovered that communities down the millennia have developed elaborate rituals and practices that restricted forest use. In Kenya, assertions by Gebremichael (2016) concur with Mwangi (1998) and Odera (2004) Castro (1990) that different communities practised varying systems of conservation. For instance, pastoralists

maintained grazing orbits that traversed large areas of grazing blocks. On the other hand, Eurocentric scholarships notably Ofcansky (1984) Anderson (2002) have refuted claims about the existence of traditional forest management mechanisms. For instance, Ofcansky (1984) blames shifting cultivation on traditional forest plundering which, according to him, could not be salvaged except by natural phenomena like disease, war and famine which controlled the human population. He viewed Africans as vessels that relied on natural phenomena to solve their problems. On the other hand, Anderson (2002) relegates the idea of conservation from Africa by positing that the idea itself grew from the 18th Century European experiences and would grow into a core concept in how both flora and fauna would be managed across the empire.

This is contrary to the position by Ofcansky (1984) and Anderson (2002) that Africans never embraced forests and environmental conservation. A Key informant referred to as Asembo in 2018 revealed that in Koder forest, customary policies were well understood and provided a sense of ownership among clans such as Kadel, Kabudi and Komolo though such rules were not forcefully applied because they were attached to a particular taboo which people feared. An FGD session held at Awach further established that some of the informal systematic taboos that were used in forest conservation included: ‘a taboo to cut (a Holy Tree)’ “*yiend polo*”. This ensured proper preservation of that particular tree for both present and future generations. Forests were also protected as both ritual cultural sites. Land within the forest was held communally as explained before and each person had rights of access based on his needs. Such rights were guaranteed by a Political authority that ensured that such access was enjoyed equitably. Moreover, traditional forests were protected by other taboos which were enumerated by the FGD session at Awach. They included: ‘Do not use ‘holy tree’ as fire wood’ (*Kik ichwak yiend polo*)- . Consequence of violating this by the perpetrator would instigate spirits to send fire to bring

down the perpetrator's house. Do not urinate in a river (*Kik ila e aora*)-. An elder, Achola in an interview in 2019 confirmed further that the consequences of violating this taboo by the perpetrator would make him suffer from bilharzia. Do not kill a frog – (*Kik ineg ogwal*), the consequence of violating this would make the river to dry up and this was undesirable because water is indispensable in life. The colonial administration encouraged some of these traditional conservation models in rivers and forests.

Taboo against using a certain tree species as firewood specifically helped in conservation of forests. A wide variety of local level controls were spearheaded over use of forests and were followed. Though this is disputed by Ofcansky (1984) and Anderson (2002) who disregarded traditional conservation as a mere charade and instead credited imperialists for coining the term conservation and consequently introducing it to Africans. Muchaga (1998) however, concurs with the position of this study that every society in the world had its own knowledge, norms and practices which were enshrined in their socio-political and economic milieu. These practices that were vested in old people who were believed to be inspired by ancestral spirits helped the people to interact with their environment. They identified and preserved these plants in a taboo system. Elder Akumu in 2019 recalled that misuse of this traditional knowledge led to punishment. For instance, in case there was no rainfall, traditional authorities could convene meetings to find out what was happening. If it was found that someone was responsible for the disappearance of rain by cutting a particular tree, then sacrifices were done for instance slaughtering a goat to appease the ancestral spirits. He was warned against cutting down a tree that, to his kinsmen, signified the burial site of their departed kinsmen. He narrated how those who defied the taboos were disciplined by being sent away from the community. According to the elder, these were areas for worshipping their God Nyasaye, *offering* sacrifices for cleansing and for rain making. There

were also avenues for rain making. The elder recalls that there were certain areas in the forest where people were not allowed to hunt, graze animals, and recently areas where people were not allowed to conduct fishing in river Awach because it was believed that they were controlled by spirits.

On the other hand, decision making over use of any forest was quite intensive and was made in line with the customary rules. For instance, it was the responsibility of the elders to authorize tree harvesting and use of forests for ritual purposes. Knowledge acquired over time with ownership of these forests was transferred through inter-generational transfer of family rights. These positions have been authenticated by various studies that have demonstrated that Africans conserved the environment by use of customary regulations which were beyond reproach. In regard to decision making over forests Otieno (2008) confirms that, in Maragoli land, elders led in the performance of rituals by use of cockerels to their god *omwami*. In Maragoli forest, only elders and a few young men would go to the shrine to perform rituals on behalf of the community. During such ceremonies, the animal to be sacrificed was clubbed to death as elders recounted their petitions to their gods for rain or for clearing a particular forest area for settlement. Key informant Ongou, in 2019 confirmed that, indeed, elders made decisions on use of the forest. For instance, in Kamiyawa near Awach River, an area was set aside by the elders for performing rituals such as: ceremony for sending away evil spirits that caused death popularly referred to in the local language as ‘tero *buru*’.

The existence of these customary rules reveal that Africans were not mere recipients of technology, they had their own conservation mechanism which helped them manage their forests. This set of argument is in tandem with Mavuhunga (2014) in his study on professional hunting among the Shona of Zimbabwe, where he notes that Africans had advanced hunting

skills before imperialism and colonization. It is from this particular sub-theme that this study sought to demystify the myth that Africans never had forests before imperialism nor conservation mechanisms of natural resources as held by Eurocentric scholars. This justified the need for the quest for knowledge of the environment by the people of Koderia forest before the advent of colonization. As Otieno (2008) aptly put it, among the Luo, forests were referred to as *bunge*, meaning a dense wood lot of thicket. They were not alienated spaces but were open spaces that were interconnected with human society through inter communal and religious uses. The next sub- theme discusses lineage formation in Koderia and the origin of the term Koderia Nguku which has been embroiled in a controversy.

4.3 The origin and lineage formation of Koderia people, the era of insect invasion and adoption of the shamba system

There has been a controversy on the usage of the names; Koderia and Koderia *Nguku* among the Koderia people and their surrounding neighbours. This set of controversy consequently set the motion for tracing the origin of Koderia people and their lineage formation. Ayot's (1978) assessment of the history of the people of South Nyanza points to Rachuonyo from the Joka- Jok group as the fore father of the people of Kasipul. Oral traditions point to the fact that Rachuonyo had seven wives namely: Omieri from Chien, Owaga Nyaluo, Achieng' Nyajuok, Auma, Aduet Achieng' Nyakila and Nyipir.

Ayot (1978) concurs with Ndege (1987) that Rachuonyo was living in Omieri's home (the wife he inherited). Omieri then became pregnant and she gave birth to a son. He wanted to name the son Chien but Chien's sons refused because they had not named chien and this was a taboo. Rachuonyo who was a hunter named the child Sipul his dog. When crying at night he was called Chien but in the day he was called Sipul. This was because Rachuonyo was initially staying in

Chien's compound. He wanted to name the baby after Chien but Chien's sons refused him because they had not themselves named Chien and this could be a taboo to allow Chien to name Chien (*chako*).

Ndege and Ayot further opine that, Rachuonyo became unpopular with most of Chien's sons except Owuor Adel. So one day Rachuonyo decided to move away from Chien's home to establish his own home. Owuor moved away with him and today they are represented by Jo-Kachien in Kasipul. Sipul, the first son of Rachuonyo, married Andugu (Nyar Tweng'a) from Uyoma. She gave birth to two sons Omala and Owidi. Owidi married three wives: Anyango, Apiyo and Olal. Apiyo gave birth to Okal who formed the Kokal sub-clan, Jwach of Kojwach and Ndaya. Ndaya married Sua and Onjaro. Sua begot a son known as Onuong'a who had many wives of whom one was Atinda. Atinda begot Onyango of Kanyango Sub clan, Otieno of Kotieno subclan and Odera of Kodera sub clan.

Kodera sub clan is today composed of three locations: Kamiyawa, Kodera Kadel and Karabach locations. Oral information from Ong'ou in 2018 further asserts that Kodera is today composed of two sets of people: the indigenous (jopiny) and migrants (jodak). Examples of migrants are Jomatabori from Tanzania (a Bantu group also found among the Gusii, Kipsigis and Kuria) who occupy Mititi hills and Otondo group who are from Gusiii land Mosocho area where they are known as Abatondo and Maragoli people from Mudete in Vihiga who occupy Dol area towards Mosocho. From this brief history of the Kodera people, the name Nguku does not appear anywhere. It emerged during the era of insect invasion in the forest as revealed by an informant referred to as Ong'ou in 2018 who reveals that *Nguku* epidemic of 1950s coincided with ascendancy of scientific management in forests in Kenya.

Having traced the origins of Kibera people, it is now prudent to show how the era of epidemics led to the adoption of the shamba system and the title 'Kibera Nguku'. It is important to take cognizance of the fact that epidemics such as: locust invasion, rinderpests and sleeping sickness were not a new phenomenon in Western Kenya and they had serious repercussions on livelihoods of the people due to the fact that they struck when British invasion was at its peak thereby rendering people vulnerable.

Lagat (1995) opines that rinderpests struck the Nandi community in the 1880s. The people referred to it in Nandi as "Cheringisiet" which was taken from the word lizard because lizards were found in all households and so was the rinderpests. This epidemic cleared the cattle economy of the Nandi. Ochieng' (2012) also confirms that rinderpests struck along the lake region and it killed the cattle economy. For instance, it wiped out cattle at Lela near Maseno which was nicknamed 'Liend dhok' (cattle grave yard). He asserts that of all the epidemics, sleeping sickness was the most catastrophic. When it broke out on the Eastern shores of Lake Victoria from Busoga district in Uganda, it crossed over to Samia, Bunyala and Yimbo. The Colonial administration ordered for the evacuation from the islands and clearing of bushes and forests around the lake. Ochieng', however, acknowledges dissenting voices such as Muriuki's in Ochieng (2012) position about the existence of such epidemics by asserting that:

'For the exponents of the British empire, as well as the propagandist of the imperial cause all over the world, the news of chaos that was occasionally brought by these destructive calamities such as : Famines, rinderpests, dysentery, slave trade and sleeping sickness were popular propaganda themes. They were eagerly seized upon to stir the conscience of an otherwise skeptical British into pressurizing their government to extend the empire building further'' (Ochieng' 2012)

From Ochieng's assessment of the era of epidemics in Western Kenya, it emerged that the British government took certain measures of coping with the outbreaks. Such measures included evacuating the people and clearing indigenous forests. Findings from the field revealed that, in Koderia forest, there used to live small insects called *Nyangueso* in (dholuo language) in and around the forest areas. These insects (*Nyangueso*) used to sting people and, in the process, cause diseases though ironically they were edible. Apart from the mayhem caused by the stinging insects, during this period there arose a disease that the locals referred to as *Nguku* that threatened to clear the human population in Koderia. This made Koderia to be nicknamed Koderia *Nguku* by the neighboring communities. The invasion by the insects coincided with the scientific ascendancy to forest management in Koderia forest as explained by Ong'ou 2018 during an oral interview. From the findings it was inferred that the title 'Koderia Nguku' was just used in reference to Koderia people who were suffering due to insect invasion in the forest. Epidemics existed as documented in history and were not propaganda as alleged by the exponents of the British Empire even though they mostly coincided with British invasion in Western Kenya who mostly took advantage of the situation to facilitate the appropriation of natural resources such as forests and consequently introduced the shamba system.

However, going forward, more studies need to be undertaken on the nexus between colonization and epidemics in Africa. This is due to the fact that there is a school of thought notably led by Ochieng' (2012) that concurs with the findings of this study that epidemics exacerbated colonization in Africa and in Koderia forest in particular it led to appropriation of Koderia forest and subsequently the introduction of the shamba system. On the other hand, Cosby (1986) opines that African societies had been to some degree interconnected with global interchanges of disease and species well before the beginning of European expansion and the Trans-Atlantic

slave trade in the 16th Century. He argues that through exposure to diseases such as small pox over a long period of time, they achieved greater immunity and at the same time the diseases in Africa proved to be a major disincentive to European colonization.

In spite of taking advantage of the epidemic in transforming Kibera forest through the introduction of the shamba system, forceful forest acquisition was, however, not experienced. Scholars such as Throup (1985) and Grove (1997) have illustrated the centrality of conflicts over environmental issues in rural anti-colonial rebellions. Grove's observation from West African experiences attest that there were often great movements precisely because natural resources were so central to lives of rural African people. He further asserts, that in late 19th Century, the West African chiefs resisted attempts by the colonial state to assert control over forests. Moreover, colonial development and conservationist strategies in British colonial territories following the outbreak of the Second World War triggered protests and helped drive peasants into the hands of the nationalists, something the British did not want to experience in future endeavors.

Retrospectively, the British did not want aggression from forest communities and in Kenya, chieftaincy played a pivotal role in reducing local aggression towards quest for forest resources. Throup (1985) observes that conservationist interventions have been present from the analysis of Mau Mau in Kenya. He opines that chieftaincy was often a lightning rod for local aggression because of both intercalary role in traditional authorities and their responsibility for many aspects of environmental management. Assertions by Throup (1985) and Grove (1997) concur with the findings of this study on the colonial attitude's diplomatic approach to forest conquest. In Kibera forest, colonialists assured the people that all these problems were as a result of the natural forest plantations which needed to be systematically wiped out for exotic tree establishment as

articulated by Lucia in 2019 during an in-depth interview. A promise was made to them that the colonialists were to return the land after completion of “their project” which entailed exploiting the region’s economic viability which, in this case, was forestry. Faced with a state of desperation, the locals surrendered their land to the whites to be cleared and artificial plantation be established in a bid to curb the spread of the disease which faded away with time.

The concurrence in conclusions from both Grove and Throup on the role of chieftaincy in environmental conservation both from West Africa and The Mau Mau case in Kenya, revealed that chiefs were expected to quell local aggression which mostly emanated from a feeling of loss of forest rights after colonial conquests. Otieno (2008) and Fastone (2016) observe that the struggle between locals and the colonialists during forest establishment were manifested in contests and negotiations between officials and rural people from the forests because these rural people made persistent claims to forest ownership and to expand forests in rural areas in the face of incessant claims of land, the shamba system that aimed at integrating forests, livestock, crops and people was adopted. Fastone justifies his arguments by noting that the colonial state through overreliance on a system of indirect rule; a policy that created African elites and utilized them to force Africans into a capitalistic colonial economy dependent on settler economy while at the same time denying them full access to that economy.

In Koderia forest, ‘Nguku’ epidemic as espoused through oral information led to the surrender of Koderia forest land to the British which later metamorphosed into labour mobilization then negotiations. In this regard, the process of negotiations and labour mobilization for the forest establishment was left to colonial chief known as Gideon Magak as explained by Lucia in 2019 during FDG session that was held at Awach. This process of negotiation theoretically entailed the existence of traditional trees that were regarded as herbs alongside allowing the locals to

conduct rituals such as circumcision by the Maragoli and Botondo from Dol and Mosocho respectively while at the same time engaging in the shamba system and exotic tree plantation as explained by Magak in 2019 during an FGD session that was held at Awach.

Apart from the 'Nguku epidemic', proponents of green imperialism opine that the shamba system was adopted as a wider scheme of a civilization mission aimed at Africans through the forests policy. An avalanche of studies in green imperialism notably: Ranger (1987), Gregory (1986), Rajan (1998) and Grove (1997), Anderson (2002) and Corbetts (2009). In their separate arguments have voiced on the shamba system as a civilization mission on African forests. For instance, Ranger (1987) opines that the British wanted African forests to appear like their forests (artificial) and rooted in their historical and cultural experiences dating back to the Industrial Revolution. The same arguments are also shared by Gregory (1986) and Anderson (2002) who posit that the British desire to transform African forests was a projection of European conceptions of imagined 'Eden'. This was due to the fact that Kenya lands, especially highlands, appealed to Whites who were willing to replicate agricultural and forestry systems to meet the industrial needs of the Metropole. These rich lands and natural forests made the Protectorate be regarded as Eden. Consequently, it informed a narrative for the need to conserve landscapes against the threats of their supposed potential destructions by Africans. While commenting on the concept green imperialism, Grove (1997) and Rajan (1998) posit that approaches to forestry were drawn from the scientific and commercial models of Europe and India. Colonial officers thus advocated for regulations in forests through the shamba system because they deemed conservation to be essential besides aiding safe resource exploitation and ultimately the future of agriculture whether by settlers or African peasants.

In a bid to advance the notion of green imperialism as discussed by Gregory (1986), Ranger (1987), Grove (1997), and Anderson (2002), and an FGD session held at Nyakiya in 2019 revealed that a group of forest farmers were selected for a benchmark and a training exercise in Kitale in the year 1953-1955 where they were taught tree species and the shamba system practices. As confirmatory opinion to Ray's (1977) second stage of articulation tenet on restructuring the local farmer from part time to full time commodity producer, a Key informant referred to as Wilson in 2019 confirmed that colonialists were on the verge of completely modifying traditional aspects of forest management while systematically destroying them. For example, they were against intercropping of indigenous and exotic species on a single plot of land. Archival information further concurs with our findings on the entrenchment of green imperialism through the shamba system whereby the colonialists encouraged field trials and training of farmers to ensure that they are fully adapted to the shamba system practices and systematically shed off traditional modes of forest conservation and food production. Part of the archival data reads:

“...it is more than doubtful, however, if such condition could be produced systematically with safety or success at a cost in any way comparable to that at which artificial plantations of cedar can be established with the aid of field crops. Where the number of cultivators is sufficient to secure complete regeneration by this means, a subsidiary method at present only in an experimental stage, may possible prove successful, this is by means of planting in lines 10 or 12 ...suppression...plantations will be done successful with after training of farmers is conducted... (KNA/NBI/f8/3/forest department annual report/1957).

With findings from this study indicating that samba system was part and parcel of environmental imperialism, questions now arise as to the extent to which environmental imperialism still exist within the African states so many years after independence. This should be a wider and rich academic enterprise for historians. As Beinart (2000) puts in, “colonialists did not only colonize

people but they also colonized their resources such as lakes, forests, religion and their modes of livelihoods”. In the next theme, the discussion shifts to the adoption of shamba system in Kodera forest in the scientific ascendancy era.

4.4 Colonialism, forest management and the adoption of the shamba system in Kodera forest (1957-1963)

In Kenya, colonialism lasted roughly 68 years. In view of the period of colonialism Fastone (2016) bisected the four epochs of forest history as follows: Contests and negotiation for African forests 1885-1910, The struggle for colonial forestry 1910 -1925, Period of consolidation and opposition 1925-1945 and Scientific ascendancy 1945-1963. The scope of this study fits within the matrix of scientific ascendancy in that it was the period in which formal forest policy was unveiled in Kenya besides being an era when the shamba system was intensified in all forests in Kenya. This sub theme focused on examining the forces that were behind the evolution of forest policies in Kenya which consequently led to the adoption of the shamba system. Before that, however, there has been a controversy on the effect of colonialism on African forests and ecology in general. There is a collection of studies that holds the position that colonial practices had adverse effects on African forests and ecology. Other studies with moderate approaches such as Ofcansky (1984) however, hold on to the opinion that as much as colonialism had adverse effects on the environment, they introduced technology that they believed was geared towards economic and environmental conservation. While quoting Andre Gunder Frank, Rodney and Amin, Machaga (1998) noted that the advent of colonialism in Africa, Asia and Latin America undermined and distorted the basis of traditional ecological knowledge without introducing viable alternatives. He notes that this distortion was accomplished by forceful seizure of land, livestock and the eventual ecological disaster that had considerable economic impacts. According to Andre Gunder Frank, Rodney and Amin, colonialism arrived on the

African scene with unsurpassed technological fury which led to the exploitation of African natural resources with intensity and without due regard to the long term effects on the life supporting systems of the environment. With regard to forceful seizure of land, exotic forests were consequently established. Ray (1977) observes that the second stage of capitalism entails the development of large scale industry which demonizes most of the vestiges of domestic modes of production. An informant referred to as Wilson in 2018 revealed that the shamba system was one of the technological aspects of production that was used by the imperialists to produce timber.

According to Machaga (1998), Ander Gunder Frank, Rodney and Amin view colonialism as an agent of socio-economic, political and ecological change that alienated local groups from their traditional institutions of resource management. A case in point is the shamba system. Machaga (1998) further opines that colonial ideas about nature were based on the European enlightenment dualism between human and nature. In this ideology of human and nature nexus, indigenous people and their lands were portrayed as areas of rational deficit – unused, empty and underused. Having concluded that Africans had conservation mechanisms before the advent of colonialism, with evidence from Corbetts and Murombedzi on European exploitation of resources, it is obvious that it is the colonizers that badly needed forest policies.

On the other hand, Gebremichael (2016) and Mwangi (1998) concur that colonialism never introduced the idea of conservation but rather transformed Africa's models of conservation by introducing their own models which they regarded to be superior. Gebremichael notes that conservation is as old as the period during which human beings have interacted with their environment. However, with the advent of colonialism, many areas in East Africa became

European centers for conservation ideology. This qualifies our earlier position that Africans had forests and models of forest conservation before the advent of colonialism.

The advent of colonialism saw a significant rise in scientific management of forests in Africa through the shamba system. Scientific management of forests was an embodiment of the state within which forests were abstracted, simplified and categorized according to their use to the state (Fastone, 2016). On the other hand, Barman (1985) assessed Settlers who came to Kenya as extremely eclectic in character and overwhelmingly moneyed. To them, Kenya was not to be a poor white colony. In this regard, systematic alienation of rich agricultural and forest land which informed policy formulations took place.

Various forest policies and legislations were formulated which influenced the adoption of the shamba system as from the year 1957 as espoused in this sub-theme. This was the period of ‘scientific ascendancy’ in forest management in Kenya as posited by Fastone (2016). There was a global radical change in forest policy in the post second World War from defence to economic exploitation. As a scientific principle in forest management, the shamba system was adopted in all British dominions to enhance a faster economic growth. While Fastone (2016) captured the period leading to 1963 as the period of ‘scientific ascendancy’ in forests in Kenya. According to Holmes (1975) this period was referred to as ‘Re-appraisal’ in Kenyan forests which, according to him, started in the year 1957-1973.

Both Fastone and Holmes terminologies mean one thing as articulated by a key informant who was an ex-World War II veteran and was later employed by the forest department, called Ong’ou in the year 2018. He revealed that Re- appraisal and Scientific Ascendancy was a period that was characterized by an extreme rapid change in technology, attitude and values associated with

forests and the environment. It was also a period of frequent appraisals and review of forest policy which aimed at changing the functions and values of forests both in social and economic terms which led to the adoption of the White Paper in 1957 as the first formal forest policy in the colony. The rapid changes in forest technology during The Scientific Ascendancy era resonates with the articulation by Ray (1977) of the second stage of capitalism which entails the development of large scale industry as local farmers are structured as full time commodity producers.

As observed in the previous paragraph, the White Paper became the first formal forest law in Kenya (GOK, Sessional Paper No1, 1968). The White Paper No.85 part (b) reiterated forest preservation policies of the colonial government. Among other things, it entailed: Setting out the colonial government plan of creating forest reserves for creating forests for national export, demands for timber and other forest products and reserving more land for forestry in light of the role of forests in soil and water conservation. It also sought to manage forests sustainably to ensure that Kenyans continued to receive forest products perpetually. Besides that, it recognized the importance of forests as both recreational and wildlife habitats which would attract tourism.

In discussing the expansion of the shamba system as envisaged in the White Paper No 85 of 1957 which was later followed by the fall of the Mau Mau movement in Central Kenya in the year 1960. Elkins (2005) and Furedi (1989) observe that the shamba system represented a model used by the colonial government to reward the Kikuyu who had remained loyal and had helped the British. To both the Kenyatta and Moi governments, forests were treated as valuable patronage resources that they used to consolidate support and fund campaigns. However, contrary to the shamba system practices in Central Kenya, in Koderia forest, in contrast to Mau and Mount Kenya forests, shambas were allocated to residents without due consideration of their

political affiliations nor role in entrenching the imperial impulse as was observed by an oral informant Daniel in the year 2018. On the other hand, opinions are sharply divided on the development record colonialists made in forestry on the eve of independence in 1962. There are opinions that cherish colonial forestry for having left an admirable development record. On the other hand, there are voices that consider the current forest challenges then blame colonial forestry as the cause. For instance, while focusing on the effect of the shamba system on ethnic groups that lived in proximity to Mt Kenya forest, Castro (1990) painted a picture of Africans struggling to find a voice within the forest department. He recounted how colonial forestry was able to replace indigenous forest systems that hitherto existed and provided spiritual resources to people around Mt Kenya, thereby eroding their culture.

In concurrence with Castro (1990), Dominguez (2020) notes that colonialism was premised on exploitation of colonized people, their resources and territories. He blames colonialism for having separated indigenous people from their natural environment which formed a crucial component of colonization besides imposing a concept known as 'fortress conservation'. Fortress conservation was based on the belief that biodiversity protection is best achieved by creating protected areas where ecosystems can function in isolation from human disturbance. On the other hand Mwangi (1998) and Fastone (2016) hail colonial conservation for having caused an increase in forest reservations under government control besides slowing down the forces of forest destructions both real and perceived. In particular, Fastone, emphasizes that, on the eve of Kenya's, independence from British rule in the year 1962, the forest department stood on a firmer ground than ever in its 60 years of existence.

He notes that the shamba system demonstrated its strength as being able to provide timber and fuel to support the modernization of the economy besides accommodating over 10,000 people who could live and work in the forest. An examination of both sets of opinions on the colonial record in forest management revealed that colonialism positively transformed Koderia forest. First of all, it is imperative to demystify the myth that the shamba system was a component of fortress conservation as asserted by Dominguez (2020) in an assessment of colonial legacies in wildlife and natural resource conservation. On the other hand, the assertion by Castro (1990) on colonialism having eroded people's culture in Mt Kenya by destroying their sacred places of worship is a spiritual and social point of view on the legacies of colonialism. The current study focused on economic change and the debate here was on the development record left by the colonialists on the eve of independence.

Oral findings from Ajwang in 2018, revealed that the shamba system was not a component or a concept of fortress conservation as alleged by Dominguez but an all-inclusive approach to forest and plant establishment. The shamba system according to Ongugo (1986) operated on the premise that residents were allocated forest plots which they could farm alongside tendering tree seedlings for 3-5 years after which they were allocated other plots within the forest. Ongugo's definition of the shamba system aptly demystifies the narrative that the shamba system was a fortress of conservation. Oral information from Ajwang in 2018 further testified as follows: "*the establishment of forest the department created employment for the locals who could afford to pay school fees for their children and build decent houses*" By empowering the locals through employment and offering livelihoods in terms of food production, this study argues that colonialists left a fully grounded forest department that was self-sustaining through the shamba system.

The post- independent governments continued with Scientific ascendancy in forest management. As described previously, scientific ascendancy era was a period of major reviews in forest policy. This period that was attached to extensive research and forest policy changes was common in British dominions. For instance, Siscavati (2017) and Gebremichael (2016) have discussed remarkable forest changes that took place in this period in Indonesia and Uganda. In Indonesia, after Surkano's regime lost power in the year 1966, the new regime led by Suharto (1966-1998) adopted an approach that envisaged natural resources as the main source of economic growth. In the name of national interest of economic growth and development, the regime promulgated laws on forestry and natural resources including basic forestry laws No5/1967 which consequently were put under the central government.

Similarly to Indonesia, Uganda gained independence in 1962 and passed policies to centralize forests. Importantly, in the year 1967, Gebremichael confirms that a new constitutional dispensation brought all forest reserves which were hitherto managed by local councils under the Forest Department which was spearheaded by the forest department. Moreover, the period 1960- 1970 witnessed significant research activities led by Norwegian International Development Agency.

From the foregoing discussions, it is clear that the scientific ascendancy period was accompanied by dramatic changes in forest policies not only in Kenya but also in most British colonies. Evidence abounds that there were attempts to evaluate both social and environmental benefits of forests notably as avenues of employment, landscape and recreational development and a view that forests should continue to form part and parcel of rural land use articulated by Holmes (1975).The bone of contention in this discussion, however, is whether research and policy changes in forests after self- rule in these British colonies contributed to forest restoration. In

Kenya, the period of scientific ascendancy not only culminated in the adoption of the first ever written forest policy in 1957 but further amendment of the same policy in the year 1968. According to G.O.K (1968), in a Sessional Paper No 1 in the year 1968 amendments were made to the 1957 White Paper which sought to reserve, manage and protect forest due to their values in the economy of Kenya besides having a joint administration of forests with county councils. Reidar (2003) confirms that as from the year 1960-1970 industrial forestry dominated forests in the world with emphasis being put on forests as an engine of economic development and modernization.

Forest industries were to play a leading role in the economic take off especially in the third world countries. Reidar (2003) further notes that, in spite of some positive results in the initial phase notably, production of enough timber for export, timber was simply exported as round wood which led to considerably felling with little planting. In addition to little planting, the use of modern technology led to unemployment in forests. This consequently led to hardships as a result of the exploitative nature of industrial forestry during.

Industrial forestry which fostered harvesting of timber without re-planting had adverse effects on Koderia forest. Information from in-depth- interview guide gathered from Gumbe in 2018 which concur with Reidar (2003) attested that a phenomenon known as briefcase logging emerged. Politician and bureaucrats disregarded planting of trees but emphasized on harvesting without due regard to the initial shamba system policy guidelines. He noted that “trees were harvested without authorization from the forest department and it is the same practice that killed Maragoli and Kisian forests”. Briefcase logging that emanated from industrial and scientific ascendancy period led to illegal logging in Koderia forest and this justifies the narrative of policy changes leading to forest loss immediately after self-rule in Kenya. Forest destruction through briefcase

logging attracted the attention of the Green Belt Movement who thought that it was initially exacerbated by the shamba system. Indeed it was the political elite and their cronies who disregarded the shamba system guidelines together with forest conservation. Part of Wangari Mathai's speeches blamed political infiltration in forest management as follows:

'It will take only the next political leadership ready and willing to use forests as they have been used in the past, to dish out forests and settle their friends, supporters and tribesmen. Nobody will be able to keep away charcoal burners and poachers of trees' (Mathai, 2009)

Just as observed, industrial forestry had a positive take off which culminated in an increase in afforestation. However, more emphasis on timber trade and production opened an avenue of corruption which consequently ushered a practice of harvesting without planting. Environmental side of forestry soon emerged as from the year 1980-1990. This is the period when environmental activists led by Wangari Maathai led spirited campaigns against shamba system for having caused deforestation in Kenya. In spite of the antagonistic campaigns against the shamba system, research on the shamba system later showed that the policy was still the best in forest management in that it encourages communal participation in forest plantations which consequently makes them to own the forest (Muchangi 2011). Just as it has been observed, the environmental forestry era emerged after industrial forestry as from the year 1980. Reidar (2003) observes that the environmental side of forestry was reinforced by increasing public awareness regarding rapid deforestation in many tropical countries.

This kind of deforestation not only threatened the survival of indigenous people like the Ogiek of Kenya but also threatened to degrade the environment besides having global implications. The need to safeguard biodiversity would soon gain momentum in the year 1990. Environmental activists like Wangari Mathai would gain international recognition for championing for biodiversity conservation amidst this period when forest restoration was given a primary role at

the expense of harvesting trees. The shamba system was later blamed for forest loss. Wangari Maathai's speeches on nature conservation nevertheless demonstrated an appetite for forest restoration but they fell short of demonstrating the role of the shamba system in forest plantation having established that it was the powerful cartels that spearheaded forest plundering and disregarded the shamba system guidelines as shown below:

“I will keep telling people... if you destroy the forest the river will stop flowing, I keep telling people let us not cut trees irresponsibly...especially the forested mountains. Because if you destroy the forest, the rivers will soon stop flowing and the rains will become irregular and the crops will fail and you will die of hunger and starvation” (Wangari, 2009).

As environmental concerns in forest conservation gained momentum, rural people on the other hand wanted a voice in forest management and this tussle consequently led to further changes and amendments to forest policy. Otieno (2008) observes that the period 1980-1990 witnessed interactions among government officials and rural people over forest reserves which led to diverse policy initiatives to accommodate local claims over access to forests and land resources. Archival information confirmed that rural afforestation extension schemes were to be an avenue through which rural claims were to be accommodated. This entailed, first and foremost, putting up another District forest office in Homabay after Migori in the year 1981-1982 and establishing a tree nursery there. Major undertakings of rural afforestation scheme were to open and maintain tree nurseries besides carrying out afforestation work (KNA/NBI/F6/2/South Nyanza DDP 1984-1988).

Apart from the rural extension scheme, further policy changes took place. According to Sessional Paper No1 of 1981, GoK (1981) titled “National food policy” this amendment emphasized that all lands were farming zones hence forests were put under the shamba. Yattick (2007) notes that the shamba system was adopted as the best approach to tree establishment.

However, with reference to the National food policy of 1981, he notes that this policy metamorphosed into a conduit for excising forest land and allocating it to individuals. Politicians in the name of landlessness allocated their cronies huge chunks of forest land and in some cases communities from outside forest areas were allocated plots and original beneficiaries driven out. He further affirms that it is such irregularities that created conflicts and hostilities between communities, politicians and government personnel. Gradual abuse of the shamba system led to intense and unregulated cultivation of forests hence the government banned the policy in the year 1985.

From Yattick's observations above, it can be inferred that the shamba system was the best policy in forest establishment. However, eternal forces with divergent interests played a key role in its first proscription in the year 1985. This demystifies the narrative that was held by the Green Belt Movement under Wangari Mathai that the shamba system was to blame for tree loss in the country. An in-depth interview with Magak in 2019 confirmed that it was indeed a question of mismanagement of the policy that led to its proscription. He attributes the 1985 proscription to corruption that was perpetuated by the provincial administration who took advantage of the 1983 District Focus for Rural Development. The provincial administration did this by soliciting funds from locals for them to be allocated forest plots which hitherto were given on a free basis as confirmed by Oduol (1986). As a result, farmers deliberately manipulated the performance of the planted seedlings by uprooting them.

Evolution and paralysis in policy reforms in the forest sector engulfed the shamba system in the forest history of Kenya. So as it continued, Yattick (2007) confirms that, in the year 1993, the president lifted the ban of the shamba system because it could not cope with the backlog in its reforestation program. That notwithstanding, Yattick further confirms that, as from the year

1986-1993, deforestation continued unabated in spite of the shamba system being outlawed through an executive order and cleared forest areas were never planted. Klopp (2012) concurs with Yattick on the surge in deforestation in Kenyan forests in the year 1993 by asserting that forests were used by the Moi state to buy support and fund campaigns. Oral information from Daniel in 2018 confirmed that in the year 1997, massive logging without replanting took place in Koderia forest under the supervision of the then District Commissioner William Oleleghi. It can, therefore, be inferred that the shamba system cannot be blamed for logging activities between the years 1986-1993 as espoused by the protagonist of the policy such as the Green Belt Movement due to the fact, that during this period, it was banned.

Further paralysis in forest policy reforms was evidenced between the years 2002-2012. While the Kibaki administration had the intention of restoring forest loss, first by setting up the Ndung'u Land Commission besides instituting further policy reforms. Such reforms could not salvage Kenyan forests from destruction. Klopp (2012), Shazia (2014) and Akker (2016) discussed forest reforms that were witnessed under the Kibaki regime. Shazia notes that the Ndung'u Land Report pointed out at key public and private figures that had played a role in historic illegal allocation of forests such as Mau; Mau forest would then become the subject of the 2009 Copenhagen conference. On the other hand, Akker (2016) concurs with Shazia (2014) on illegal logging that bedeviled Kenyan forests, He notes that, as a result of illegal logging, UNEP in World Heritage report reprimanded the Kenyan Minister for Environment and Natural Resources to initiate the stoppage of excision of forest land to resettle people. This indicated that Kenyan forests were being exploited in the interest of the ruling elite without due regard to the shamba system guidelines and as Klopp (2012) puts it, the change in government again saw the proscription of the policy in the year 2003.

An in-depth interview with the chairman of CFA, Wilson in 2018 at Awach confirmed that the executive orders of the year 1986 and 2003 were occasioned by a devastating threat to forest law enforcement and follow up. He blamed the leadership of the forest sector and the country for excision of forests and shift the blame on the shamba system. From this interview, it emerged that some of the squatters in Koderia forest were initially forest workers who later grabbed forest land. Even after the ban of the shamba system, those squatters were still residing in the forest.

After the shamba system ban in the year 2003, the shamba system pilot study was conducted in Ndundori forest in the Rift- valley and found to be effective in establishing forests as espoused by Kagombe and Gitonga (2005). And as Kariuki (2013) puts it, the success of the shamba system from pilot studies witnessed further forest policy soul searching. This includes Forest Acts 2005 and 2007. Before the Forest Act 2005, Mathu (2007) opines that the responsibility of conservation of forests including enforcement of regulations lay with the government. Section 46 of 2005 Act recognized the rights of forest adjacent communities to derive both spiritual and material benefits from forests. It also recognized that forests are part and parcel of communities and most importantly, it recognized that forests should be used sustainably. In the year 2007, there was another forest Act as espoused in Sessional Paper No 1 of 2007 (GOK, 2007) which geared towards providing continuous guidance to all Kenyans on sustainable management of forests besides stressing the need for greater cooperation and linkage among resource owners, users and resource planners.

Findings from Ndundori forest on the success of the shamba system justified the position of this study on the effectiveness of the shamba system in establishing forests. However, the policy failed in Koderia forest in the post- colonial dispensation as revealed by Ong'ou in 2018. Besides the failure of the shamba system in Koderia forest, the findings from the FGD session held at

Awach showed that both 2005 and 2007 Forest Acts empowered local communities to participate in forest management through Community Forest Associations (CFA) that hitherto never existed.

Communal participation in forest conservation would again take effect in the year 2012 when the shamba system successor, Plant Establishment and Livelihood Scheme (PELIS) was unveiled. It has been observed that it is the ruling elites that contravened the shamba system guidelines leading to its failure in spite of research indicating that it was best suited for establishing forests. PELIS is out of the scope of this discussion but for it to be successful, it must embrace the vision put forward by the department of forestry establishment and livelihood improvement. While the discussion in this chapter focused on the factors for the adoption of the shamba system which has been discussed under this sub-theme. Findings from this study indicates that the shamba system was part and parcel of environmental imperialism just like in the previous theme. In the next theme, the discussion now shifts to the Post –Second World War (Scientific ascendancy era 1957-1963) and the rise of timber trade leading to the adoption of the shamba system in Koderia forest.

4.5 Scientific ascendancy era and the adoption of the shamba system in Koderia forest 1957-1963

Conservation discourse was a phenomenon in the colonial state especially in areas where settlers were present. Forest policy no doubt changed in the Post-World War II as a result of conservation discourse together with the quest for development of colonies. Before and during the Second World War as Homes (1975) puts it, forests were expanded in the colonies for reasons of defence strategies. The aftermath of the war rendered reasons for using forests for reasons of defence unjustified. Emphasis shifted to production of timber for trade hence this period was referred to as the scientific ascendancy era due to the fact that a lot of scientific

principles were subjected in forests for economic take off following a ravaging world war (Holmes, 1975). This required establishment of more forests through the shamba system. Beinart (2000) confirms that the aftermath of World War II saw the emergence of scientific prescription to forest management in Malawi known as community forest schemes for wood and timber production. Anderson (2002) in his analysis in Lembus forest in Rift- Valley Kenya holds that financial success of forestry in India provided an arena for conservationist strategists to apply in Lembus forest. Fastone (2016) acknowledged that the shamba system would become a core in forestry operations in Kenya. He observed that the system was largely responsible for 42% of the planting done by the forest department up to the year 1963. In Koder forest, however, apart from timber trade as espoused by Beinart (2000) and Anderson (2002), archival data revealed that shamba system was adopted for purposes of meeting the demands for wood fuel for the tobacco industry as from the year 1979-1985. The archival source from the table below describes the projections for tobacco fuel requirements from the years 1979-1985:

Table 4.1: Tobacco fuel requirements from Koder, Wire and Ranen forests 1979-1985.

Year	Projected area of tobacco	Hectares of bush wood required	Hectares of Eucalyptus required
1979-1980	1200	5400	900
1980-1981	1500	6750	1125
1981-1982	1800	8100	1350
1982-1983	2100	9450	1575
1983-1984	2400	10800	1800
1984-1985	2700	12150	2025

Source: KNA/NBI/F6/2/SNYZ/ DDP/1979-1983

Table 4.1 above is an archival data that was extracted from South Nyanza district development programme. It shows a steady rise in wood fuel requirement that was needed in the tobacco industry in the period 1979-1985. Wood fuel was harvested from Koder and other forests such as Wire and Ranen in South Nyanza. These wood fuel were produced through shamba system.

In a bid to contextualize the information from Table 4.1 above, a key informant referred to as Ajwang in 2018 revealed that the British American Tobacco industry had embarked on a programme of promoting afforestation in the entire South Nyanza district by issuing seedlings to tobacco farmers. First, they opened some tree nurseries in tobacco areas like Oyugis and Taranganya. In Oyugis, they hoped to reap fuel wood from Koderia and Wire forests where the shamba system had contributed to timber establishment which could be used as fuel. From Table 4.1, it is clearly evident from the table that there was a steady increase in the projected area for tobacco requirements in subsequent years with respect to increase in fuel demands that Koderia, Wire and Ranen alone could not manage to supply. It was against this backdrop that various hills were to be set aside for tree establishment through the shamba system. Examples of such Hills included: Miriu Karachuonyo, Homa, Wire, Nyakune, Otacho, Magina Marabo, Kwa, Got Asego and Nyabisawa (KNA/NBI/F6/2/SNYZ/ DDP/1979-1983). Ironically tobacco farming was not so much undertaken in Koderia area. Basically, the wood fuel were transported to Migori where tobacco farming was undertaken on a large scale as explained by an oral informant, Ajwang in 2018.

Apart from the shamba system of forest management being adopted for purposes of wood fuel for tobacco industry, the Scientific ascendancy era in forestry in Kenya witnessed the advancement of the shamba system through a Ministerial Declaration Statement (6) of 1958 (Holmes, 1975). Forest policy henceforth was to give emphasis on cheaper modes of forest establishment besides diversification of forests through employment creation. Fastone (2016) and Amoah (2009) observe that the shamba system was pragmatic, local and an adaptable policy. Its success in India was influential and therefore made it be advanced in other British dominions. The British heavily relied on the shamba system to establish tree plantations in

forests in Kenya due to the fact that the aftermath of the Second World War enhanced the desire for the colonial government to exercise even greater control over the locations and to expand their mandate in financing and managing of their own activities. The shamba system was regarded as a cheaper method of forest establishment. Moreover, British imperialists realized that plantations of trees were earlier established in Burma without including field crops that could be tended by the community and that proved to be quite expensive than the formation of plantations with the aid of field crops. The narrative that the shamba system was a cheaper method of forest plantation establishment concurs with South Nyanza Annual report on forestry of the year 1959 that aptly describes it as follows:

“Planting is done almost entirely with the aid of temporary cultivation with maize or other crops, and the work is out efficiently and cheaply. The cost of clearing, planting and initial weeding works out at about 1 dollar an acre, this being exclusive of the cost of staff and of raising the plants in the nursery. With the view of cheapening the work still further, experiments might be made to ascertain if species whose seed is plentiful and not too minute could be raised by direct sowing, preferably in lines or patches” (KNA/NBI/F8/3/South Nyanza annual report on forest conservation, 1959)

Information from KII confirmed that after independence, the Kenyan government introduced the shamba system to reduce production costs and that was one of the cornerstone factors for the re-introduction of the shamba system in Koderia forest in the 1990s after the 1986 ban as reported by an oral informant as follows:

“The government used this policy because it was cheap in establishing trees. You know someone gives you a plot then doesn't pay you. Then he expects you to tender the seedlings. We loved it since initially it was on free plots without pay”.
(Odhiambo 2018)

On the other hand, it is also worth noting that, as from the year 1960, increase in population in the Kenyan colony was of great concern to the colonial government. It was estimated that in 1960, the population would be at 4.35 million and about two million in the eastern part of Uganda (Fastone, 2016). Moreover, Gichuki (1993) in concurrence with Fastone (2016) observes the year 1960 and beyond as a period that was marked by colonial officials and American foundations dispensing aid. They viewed the surge in population as a problem both for social and environmental reasons because they viewed population growth as a phenomenon that could undermine development and expenditure and exhaust natural resources. Population projections on Divisional level from the population census of the year 1979 is shown in Table 4.2 below where Kodera forest fell within Oyugis Division. The population density at that time in Kodera was estimated at 133 and later 174 persons per square kilometer (KNA/Forest department Annual Report, 1960) as indicated on the table below:

Table 4.2: Population Projection on Divisional level: population census 1979

Year	KENDU	OYUGIS	MIGORI	KEHANCHA
1979	105,908	106,995	85,384	85,082
1983	135,498	136,889	109,201	108,853
1985	145,024	146,512	116,878	116,506
1988	160,679	162,328	129,495	129,083

Source KNA/NBI/F6/2/ South Nyanza/District Development Plan/ 1984-1988

Table 4.2 above was extracted from the Kenya National archive on population projections per division levels in South Nyanza. From the table above, Kodera forest is found in Oyugis division.

From Table 4.2 above, it was deduced that the colonial government was working on the assumptions that consumption of timber per head would have risen to 2 cu.ft. by the year 1979. The Conservator of forests estimated that in the five year period 1957-60 the yield from conifers plantations would rise to 2,09900 cu. ft. The colonial government felt that by using the shamba system to increase plantations, timber requirements both for internal and external consumption would be met. This was confirmed during an FGD session that was held at Awach in 2018 which revealed that as from the year 1960, the forest department increased tree nurseries to fifteen from the previous seven in the district with additional ones being at Awach and others in Migori and Lambwe. This saw a lot of commitment from farmers in tending the trees. This was in a bid to intensify the application of the shamba system so that timber needs to be proportional to the projected population as explained by a key informant, Atanga in 2018. The intensification of the shamba system through the establishment of more tree nurseries entailed subjecting farmers as full time commodity production due to the fact that farmers committed themselves fully to tree tending (Ray, 1977). Consequently, commitment of farmers as full time commodity producers was a key principle of the scientific ascendancy era in forest management in Kenya which majorly delved on economic take off of third world countries following a ravaged economy due to the Second World War as earlier stated in this chapter.

Similarly, having farmers as full time commodity producers would ostensibly create employment in forests and allied industries due to the fact that unemployment was of great concern to the colonialists. Studies by Mwatika (2013) and Oduol (1986) concur that the shamba system ensured full time employment to many forest communities and beyond. Forestry was considered both as a skill and a scientific profession according to an annual forestry report which partly states:

“...we regard employment as one of the main objectives of afforestation for efficiency in production, which is the ultimate test, it is necessary to take advantage of all useful labour saving devices. Nevertheless, forestry present a useful and in many cases the only apparent means of developing parts of rural Britain”. (KNA/south Nyanza annual report 1959)

Findings from this study are in tandem with the narrative that the shamba system was adopted as an avenue for employment creation. The system guaranteed full and part time employment to most residents. Just like the British system as espoused in the above citation, this was also confirmed by an FGD session at Nyawende in 2018 where an elder oral informant named Anjlina opined that there was no need to look for job opportunities in towns because farming in forest would salvage their financial needs. Observations by Ray (1977) on the mutual existence and benefits of both pre-capitalist and capitalist at the initial stages of production concurs with that at this stage, there was no need for migrant labour out of Koder forest. This is due to the fact that the local farmer engagement in food production in the forest existed side by side with large scale timber production which was to the benefit of the colonial government.

4.6 Conclusion

This chapter had set out to account for the evolution of Koder forest and the adoption of the shamba system. Firstly, it has demystified the narrative that Africans had no forests before the onset of imperial hegemony as championed by Ofcansky (1984) and Crosby (1986). An assessment of forest conservation mechanisms that the people in Koder forest put in place before transformation of the forest through adoption of the shamba system revealed that, indeed, forests existed. The shamba system consequently transformed Koder forest from pre- capitalist forms of forest management to capitalist forms of management. Moreover, the adoption of the shamba system in Koder forest was a wider scheme of imperialism that was geared towards the

transformation of the forest through the introduction of exotic tree species so that Koder forest could project European models of forest establishment which were regarded as essential for efficient and safer forest exploitation. Nevertheless, the shamba system proved to be crucial in afforestation programmes amidst challenges that affected it leading to a remodeling of its successor PELIS (Plant Establishment and Livelihood Scheme) which was beyond the scope of this study. While colonial policies have been generally blamed for marginalization of Africans in various capacities, colonial environmental policies which were largely dependent on by the British like the shamba system has proved to be essential in afforestation and development in the post independence era. The next chapter focuses on economic changes that were witnessed following the application of the shamba system in Koder forest.

CHAPTER FIVE
ECONOMIC CHANGE FOLLOWING THE APPLICATION OF THE SHAMBA
SYSTEM IN KODERA FOREST (1957-2012)

5. 1 Introduction

The economy of a society is the foundation of social demographic and material gain as opined by Bouchat (2010). In regard to this assertion, there are several components that contribute to development with natural environment being particularly important to the success of economic activities which include agriculture, forestry, fishing, hunting and gathering. Most importantly, the engine for economic transformation has been through ‘Green Revolution’. Scientific ascendancy to forest management that entailed a review of forest policies and, consequently, the adoption of the shamba system outlived the colonial epoch and remained central in the development strategies of African states and international agencies.

Observations by Ndege (1987), Onduru (1992:2009), Amatsimbi (1993) and Cokumu (2001) concur that colonialism transformed the modes of production especially in agriculture and consequently, incorporated the people into the world capitalist economy. This study, however, delved into the economic changes that were witnessed in Koder forest following the application of the shamba system. This chapter commences with the economic organization of Koder residents and forest uses on the eve of application of the shamba system. Discussion of colonialists and the African elites as agents of change, migrant labour, and finally enumeration of new farming techniques, tree species and tools that were introduced.

5. 2 Economic organization and forest use in Koder forest on the eve of application of the shamba system, 1957

Extensive research has been undertaken on the interaction of people living in or on the fringes of forests in regard to forest utilization and their economic activity. Evidence from these studies concur that population density of the people living adjacent to forests would determine the level

and manner of resource exploitation. Such studies include Schoffeleers (1979), Yanagisawa (2008), Showers (2006) and Mundi (2020). They observe that historically, people who lived in and on the fringes of the forest exploited the forest once iron tools were available besides conducting agriculture. They also observe that sedentarization and agriculture changed the relationship between humans and environment in that with increase in human population, interactions between human groups became more important hence they were able to exploit forests through settlement, hunting and as avenues for pasture. On the other hand, Castro (1990) partially concurs only on the aspect of settlement. He observes that the Kikuyu people on the eve of imperialism had enough land, livestock and labour in the form of extended clan and increase in number of trade caravans into the interior made them set aside forest areas for pasture and for exchanging animal products with the Caravan traders.

Findings from this study concur with the above observations except Castro (1990) on his position on forest communities displaying partial utilization of forests. Economic organization of the people of Koderia was a product of the environmental factor. Evidence abounds that their way of life was organized and influenced by how the people related with the forested environment that attracted reliable rainfall that was suitable for farming. They practiced mixed farming which included cattle keeping and crop production according to an oral informant referred to as Odembo in 2018. Environmental factors determined the migration and settlement of people and indeed some clans settled inside the forest while majority stayed on the fringes of the forest while they used the forest for hunting, and as shrines besides being avenues of herbal medicine. A KII informant, Ong'ou in 2018 gave an account of their relationship with their environment as follows: *"We did a lot of hunting, herbs production as well as grazing animals. Not all of us*

stayed in the forest. Inside was cold and full of wild animals. Only Naman and Oruko clans stayed there because they had no land ''.

Apart from environmental factors (forests) influencing the settlement of Koderia people, it emerged that agriculture was predominant over pastoralism among Jo-Koderia in the 19th century. The predominance of crop growing over cattle keeping is a big debate in Africa. While Cosby (1986) justifies predominance of agriculture (crop production) by plant transfer to Africa mission that happened during the onset of imperialism where exported plants proved to be more powerful than those from the periphery coupled with the narrative that Africans were environmental degraders, destocking policies would follow during colonization.

This narrative by Cosby (1986) on predominance of agriculture over pastoralism that was occasioned by plant transfers which is discussed in detail by Karen (2003) is sharply refuted by Hardin (1968) who opined that movement towards systematic policies of privatization had impacts on pastoralism. He further quipped that narratives of pastoral activity in which accumulation was measured in animal numbers at the cost of both quality and pasture dominated Eurocentric scholarship while studies in Baringo showed that environmental degradation was not a product of overstocking but a long term trend of anthropogenic activity. Effects of privatization on land degradation needs further research. Nevertheless, in Koderia forest, the natural environment supported agriculture besides the availability of iron implements like hoes and machetes that were obtained from Gusii land. Furthermore, the new settlement placed the people in the position of middlemen between *Jo-Kagan* from Rangwe and *Gusii* people, therefore enabling them to engage in exchange of commodities. There was then need to produce surplus grain for exchange with *jo-karachuonyo* as explained by an oral informant named Eric in 2018.

On the other hand, when it comes to plant establishment, most environmental historians concur that food crops and trees shot through self-regeneration. This means that trees were never planted. Rather, they grew on their own. Showers (2006) observes that, until 20th Century, the uprooting of tree stumps was considered as wanton destruction of trees because uprooting killed self-regeneration. While in concurrence with Showers (2006), Cosby (1986) refers to self-regeneration of plants as unintentional growth which was facilitated by natural forces. Nevertheless, he observes that it is this self-regeneration that made Africans not to plant trees. However, he affirms that natural forces that precipitated self-regeneration did not disappear with the advent of imperialism.

Oral information however, refuted the idea that food crops regenerated on their own. An oral informant named Ong'ou in 2018 recalled that Koderia people grew a variety of crops to satisfy their needs for food. These were planted during both short and long rain seasons. These included grain crops such as sorghum, and millet used as food. Some crops, however, regenerated on their own, such as the traditional small tomatoes (*nyanj nyatonglo*). Trees also regenerated on their own. After cutting of trees, new seedlings shot from the stumps and with time, they would mature to form trees. It can be inferred from this debate regarding the generalization that African plants and crops all developed accidentally have no basis. This is because a field study from Koderia forest revealed that though plants developed although self-regeneration food crops were mostly planted. This narrative that relegated Africans as recipients of plant products and not planters warrants further scrutiny from natural scientists and environmental historians.

Furthermore, an avalanche of studies holds that, in pre-capitalist Kenyan communities, land as a mode of production was occupied and managed at clan level. Works by Ndege (1987), Wanyoike (1991), Onduru (1992; 2009), Amatsimbi (1993), Cokumu (2001), Kamau (2013) and Wasike,

(2018) asserts that land and land ownership was held by communities with authority emanating from clan elders. Family heads would then divide land and give it to individual mature male members. Most of these studies generalized on land use and tenure system. However, when it comes to forest land ownership, the closest point of reference was a study by Kamau (2013) who opines that forests were based on land. Forests were managed by clan elders and it was possible to have tenure arrangements where tree ownership and exploitation rights were held separately from land. By examining the transitional forms of capitalism as articulated by Pee (1980), findings from this study revealed that Koder forest was secured by the colonialists, modified and transformed from public to private tenure system which was consequently followed by the development of large scale exotic tree plantations.

In Koder forest, however, in contrast to observations from Wasike (2018), Ndege (1987) and Onduru (1992: 2009) that have generalized on land holding system on clan basis, a study by Kamau (2013) on management of forest land explicitly concurs with the observations of the current study. An FGD session held at Awach in the year 2018 revealed that Koder forest was managed by community clan elders, forest land was regarded as places of performing rituals and ceremonies such as the ceremony for sending away evil spirits (*tero buru*). A KII informant Ong'ou in 2018 revealed that each clan had its own distinct area within the forest for such practices. Moreover, exploitation rights were held separately from land rights. For instance, there were medicinal trees that were regarded a taboo to exploit by people in the society who were not yet recognized by the society as healers for example (*nyabul*). He further revealed that, given that population densities were generally low compared to resources and also that resource exploitation was designed to fulfill immediate consumption needs and only limited exchange values, these medicinal trees were not commercialized. However, a healer could be awarded a

goat as a form of thanksgiving for healing someone or in most cases it was free as it was the norm in the pre-capitalist setting. Examples of such healers were people like; Oyundi Michele, Asugo wuon Ong'ondo and Oyola. From the testimonies of Ong'ou in 2018 and FDG session that was held at Awach in 2018, it was inferred that a dichotomy of tenure systems emerged. Notably, these were forest land tenure and tree tenure systems. It was inferred that a clan would own land within the forest but some trees within the same plot belonged to specific groups within the same clan such as medicine men. Those who owned such specific trees within the forest had tree tenure while land owners had land tenure rights.

Nevertheless, forest exploitation in terms of bush clearing and tree cutting required use of forms of technology. Studies in pre-capitalist technology in forest management reveal that Africans were advanced in forest technology. Such studies include Wiersum (1997), Parrotta (2012) and Hecht (2014). The scholars above concur that modifications of the environment started with use of fire much earlier before embarking on agriculture. Fire was one of the most effective strategies that past generations harnessed basically for changing and enriching forests and other areas with food and other useful plants. In particular, Wiersum (1997) observes that people living in and near forests have managed forests in various ways and levels for millennia. He further observes that paleobotanical research in New Guinea has revealed that people as early as (30,000-40,000) years ago were manipulating forests by trimming, thinning and ring barking in order to increase the natural stands of tree, bananas and yams. Oral information from Ondeyo in 2018, contrary to the observations by Wiersum (1997), Parrotta (2012) and Hecht (2014) confirmed that forest management in pre- capitalist Koderia forest was anchored on taboos and regulations which were observed in the previous chapter. From the observations made, detailed

technological use of forest technology in Koderia forest could have existed but it requires both archaeological and anthropological study so as to authenticate the existence of such technology.

5.3 Effects of the shamba system in instigating economic change in Koderia forest (1957-2012)

Britain's legacy in the world has been described by Tucker (1989) as a system of resource management and exploitation. The system of resource management and exploitation has compelled environmental historians to delve more into Grove's (1995) thesis on 'drastic ecological consequences of colonial rule and capitalist penetration. Using the shamba system as one of the pillars of resource exploitation, this study sought to affirm that the policy not only had ecological consequences as alluded to by Grove (1995), but also economic consequences or changes. The transformation of Koderia forest by adoption of the shamba system was a joint venture between the Colonial administrators who introduced the shamba system and the locals who adopted the policy. Archival information confirms that colonial administrators introduced and supervised the implementation of the shamba system through forest orders and circulars (KNA/NBI/3/1 Forest orders and circulars 1958-1963). Moreover, with colonial botanical garden providing the basis for institutional emergence of ideas as opined by Grove (1995), it was imperative to briefly discuss the personalities and their ideas in the transformation of Koderia forest through the shamba system.

5.3.1 Colonial administration as an agent of change in Koderia forest

Environmental historians have divergent opinions on colonial legacy. While some have affirmed that colonial legacy left a negative land mark in forests, others hold the position that colonialism, in spite of the challenges that they might have witnessed, left a positive land mark in forest development with such policies such as the shamba system remaining be central in the development strategies of independent African states and international agencies. For instance,

Beinart (2000) holds that, while colonial states in Africa facilitated appropriation of natural resources and forest protection, they attempted to eradicate diseases which consequently led to a change in the health of the people. On the other hand, Castro (1990) blames colonial forestry for replacing indigenous forestry schemes that existed to provide both spiritual and physical resources to people.

From the foregoing discussion, it is worth noting that the colonial administrators led in the establishment of Koder forest and applied the shamba system as a mode of production. The shamba system led to the introduction of new agricultural tools, crops and new species of tree seedlings. This economic empowerment resulting from the shamba system would enhance the conservation and management of Koder forest as explained by an oral informant Ochore in 2018. One notable colonial administrator who was worthy of discussion because of his profound influence in the establishment of Koder forest is Mr. Young popularly known as *Bwana Young* by the locals.

Much as Berman (1985) describes settlers who came to Kenya as being extremely eclectic in character and moneyed at the expense of conservation of the environment, on the contrary, Beinart (2000) observes colonial administrators as advocates for efficient and safe exploitation of forests which formed the future of agriculture. Beinart's observation of colonial administrator's quest for efficient utilization of forests was confirmed by Mr. Young's narratives to some of the pioneer forest workers on colonial view of forestry was articulated by a KII informant, Wilson in 2018. He (Young) strongly believed in European scientific forest management (shamba system) as did many of his contemporaries, and he considered African forest usage a threat to forest survival. British training in forestry was considered the best because it was believed that it furnished the best possible training in the higher branches of

forestry and it was hoped that Kenya, as a colony would benefit from it . By amalgamating Berman's (1985) transitional forms of capitalism with the current study findings, evidence abounds that, from such trainings, pre- capitalist modes of forest conservation such as self-regeneration were to be systematically shed off to clear the way for the creation of colonial forestry that would lead to the production of exotic trees hence this marked the stage of modifications of indigenous forests.

Regarding forest operations, Mr. Young took orders from the Assistant Conservator of forests who was in turn answerable to the Chief conservator based in Nairobi. Locally, he worked together with D.C South Nyanza, Kisii and the local chiefs.(KNA/NBI/1/3/Forestry- Nyanza province/ 1950-1959). A KII informant named Gumbe in 2018 confirmed that during the initial years, demonstration fields were set up at Awach. These fields were set up to improve African tree establishment which was hitherto left to develop through self-regeneration.

Moreover, the colonial administrators realized that, for the type of economic change that they had in mind to be effectively introduced in Kodera, chiefs were indispensable in bringing about these changes. In a bid to contextualize the role of chiefs in environmental conservation in colonial Africa, Grove (1997) posits that the centrality of conflicts over environmental issues was common with rural anti- colonial movements in West Africa. These movements were quite often experienced because natural resources were deemed crucial to the lives of the rural people. He further asserts that, because chiefs in Nigeria resisted attempts by the colonial state in the 19th Century to assert control over forests, changes in forest administration were necessary. In this regard, changes were made which required chiefs to help in curtailing protests besides identifying and arresting peasants who joined the nationalists. The introduction of chiefs in the management of the shamba system and forestry was justified because, in the process of aligning

pre- capitalist and capitalist forest management techniques, as officers on the ground, they could mobilize and convince locals with ease to adopt exotic tree establishment. This resonates with Pee (1980) who observes that chiefs were instrumental in the process of aligning the capitalist modes of production with the pre- capitalist modes of production to the advantage of the imperialists. A KII informant named Atanga in 2018 confirmed that Chief Gideon Magak was instrumental in labour mobilization besides the identification of locals who were suitable for benchmarking exercises in Kitale.

Apart from Grove (1997) position of the role colonial chiefs played in environmental conservation from West Africa, Anderson (2002) in a bid to articulate the role of colonial chiefs in forest establishment in Kenya opines that, the British had a desire to transform Kenyan forests to meet their projections of imagined 'Eden'; which entailed creation of monoculture fields of timber to be harvested and sold. He further asserts that forestry was an expression of state power. The colonial state thus utilized African chiefs to force Africans into a capitalist colonial economy dependent on settler agriculture.

In Koderia forest, establishment of the Shamba system did not elicit rural uprisings as stated by Grove (1997) as the case from West Africa, oral information from Peter in 2018 confirmed that the British had entrenched their rule and locals had learnt the British military might from the Gusii resistance of 1905. However, findings from this study concur with Anderson (2002) that colonial chiefs were still needed to sell the colonial agenda to the locals and indeed force them into a capitalist colonial economy. District Development Plans 1979-1983 from South Nyanza confirm that chiefs were expected to set up tree nurseries. Chiefs were also in a position to urge the people to purchase new agricultural tools and seeds (KNA/DC/KSI/1/12/ 1959). A KII informant named Ombogo in 2018 described chief Magak as a leader who commanded a lot of

respect. This was attributed to two locations today that are named in honor of his service that is Ka Magak East and Ka Magak West both in Kasipul Homabay County. He described him as follows:

'He was shrewd and ruthless especially for those who were found destroying the forest, and you know he was also a learned man, many feared and respected him due to his level of education'

After the adoption of the shamba system, the government introduced various methods of promoting forestry in the colony. Reidar (2003) reveals that the period from 1957- 1970 was known as the industrial forestry era. Forests were expected to play a leading role in economic take –off in Global South and therefore vocational training, setting up saw mills and establishing plantations were some of the ways used to promote tree planting. The colonial government realized that without surplus labour, no meaningful plantations could be established (Pee, 1980). Generally, the local people were encouraged by Mr. Young and Chief Magak to continue growing new species of trees such as cedar, bamboo, Eucalyptus, cypress, conifers because they were considered to mature faster rather than relying on independent regeneration of native/traditional trees which took a longer time to mature besides the fact that their timber was not reliable. This view of the colonialists showing contempt for African trees and their timber when compared to the alien/exotic timber which they introduced was part of a wider imperial scheme of destruction of indigenous species at the expense of preserving the exotic ones (Berman, 1985) . The mission of ‘destruction’ of traditional trees however, was systematically applied since further research on the viability of certain exotic trees to western Kenya weather and soil conditions was still ongoing as espoused in the plan of work for Uplands forest district shown below:

'Although forest research has not yet been placed on an organized basis, a good deal of knowledge has been acquired through experience, particularly in raising plantations. A great deal of botanical identification of trees suitable to varied conditions is still to be accomplished.'
(KNA/NBI/1/48/Plan of work for upland forest districts 1959)

Apart from the spirited campaign for exotic tree species, other methods included giving free seedlings and new crops to people. Beinart (2003), Cosby (1986), Williamson (1996) and Mayr (1965) concur that European plant species and tools proved to be more powerful than those from the periphery. They further assert that the pattern of colonization and trade meant that introductions were predominantly from Europe and therefore empires facilitated plant transfer in an extraordinary scale. A KII informant named Winfred in 2018 confirmed that the colonial administration encouraged people to adopt new plant species alongside new farm implements such as rakes and planting lines. Chief Magak and headmen urged the people of Koderu to purchase these farm tools in order to boost large scale tree plantation and transform farming that hitherto the introduction of the shamba system was purely for subsistence especially crop production. This transformation of forestry and agriculture from subsistence to large scale production is articulated by Ray (1977) as a capitalist phenomenon that was geared towards developing large scale production besides restructuring local farmers as full time commodity producers. It was inferred that the intensification of timber trade following the scientific ascendancy to forest management era 1957-1970 informed the development of large scale timber production.

The colonial government exhibited a strong desire to have a substantial improvement in African tree establishment to serve the local market in terms of timber production and for

effective forestry utilization, botanical research and training for African forest instructors were deemed necessary. Beinart (2003) and Karen (2003) confirm that botanical research and training were changes that the imperialists introduced in the forest departments in Africa. For instance, the Cape Botanical garden was established by Von Ludwig in the 17th Century which consequently led to the spread of exotic species and how they could be grown under hostile environments. The same trend was experienced in Madagascar's French colony where a botanical garden was also developed. In East Africa, Fastone (2016) opines that German East Africa Company led in research and experimentation in rubber tree cultivation. This caught the attention of the British which was struggling to find a core export product apart from timber. From the archival data, it was evident that a botanical garden in Kenya was established in the forest department arboretum in Nairobi under Mr. Battiscombe in the year 1921 when the shamba system was established in Mount Kenya forest, Part of the report reads:

'Although forest research has not been placed in an organized basis...a great botanical work has been done by Mr. Battiscombe a keen botanist... he has prepared a useful list of all known forest trees and shrubs of the colony...much useful work has also been done in the experimental cultivation of trees both indigenous and exotic''.
(KNA/NBI/V/1/Troup Commission 1921).

Botanical research findings were to be followed by a series of trainings and benchmarks in the regions that had been earmarked for the shamba system (KNA/NBI/1/48/plan for work for Uplands forest districts 1959).For Koderia people an in-depth interview by both Atanga and Harison in 2018 revealed that benchmarking exercises were organized in Trans-Nzoia to study the north –rift forest establishment and management after which they would implement the same in Koderia forest. This included construction and how to plant seeds in seed beds. This was the modification stage in the articulation of modes of production theory. The informants further revealed that the imperialists embarked on curtailing the freedom of movement of residents into

the forest. For instance, grazing of animals in the forests was restricted which elicited protests. This is why the state of forestry between the period, 1940-1990 is examined by Otieno (2008) as an institution engulfed in contests and negotiations. Residents who took part in the benchmarking were selected by Chief Gideon Magak in liaison with elders from various clans. In 1957, sorghum was planted alongside tree seedlings. On the other hand, those people who had acquired western education had learnt new methods of tree establishment demonstrated methods such as pruning to the villagers.

Further revelations of the role of chiefs in forest management attest to the fact that, from the year 1950s onwards, Local Native Councils were required to submit proposals for development with locational estimates to be submitted to African District Councils finance and general purpose committee for approval. Locational chiefs became the ex- officio chairmen of the Local Native Councils. Members of the councils were in theory nominated from sizeable sub-locations by the District Commissioner for a term of three years. LACs operated without legal status until 1959 when legislation was formulated to make them statutory authorities with wide powers to the extent to which no agreement was reached. These Local Native Councils also discussed matters relating to forest management and recruited forest workers (KNA/PC/Nyanza/2/1011/Forestry conservation and afforestation 1951-1957). In tandem with these observations, data from KII confirmed that Chiefs and Assistant Chiefs were required to publicize large scale tree plantations even in their private farms. Furthermore, changes in tree establishment were witnessed when the Ministry of Agriculture was tasked further to assist farmers by provision of extension services such as artificial insemination on cattle as revealed by an informant named Akumu in 2019. Colonial administrators were forerunners in implementing colonial policies, they ensured that environmental conservation and tree planting was done.

Besides that Furedi (1989) further asserts that forestry was a body of imperial technical expertise used to fix colonial problems when need arose and to this effect, colonial chiefs were instrumental in effecting necessary changes.

5.4 The shamba system as an agent of employment and migrant labour in Koder forest

The shamba system created employment and consequently led to the rise of migrant labour. According to Amin (1974), a migrant worker or labourer is a person who either migrates within their localities or to an urban center to pursue work. He further asserts that in colonial times, migrations occurred due to a series of labour requirements for plantations and, later, administrative opportunities. Studies in economic change by Ndege (1987), Onduru (1992) and Cokumu (2001), affirm that the pre-colonial division of labour, which was well defined, was altered during the colonial period in that, as men went out to look for wage labour, women were left behind and they had to take up their duties. Women and children had to assume home agricultural production.

Meanwhile, studies in environmental history by Bennet (2015) assert that colonial reshaping of forest access in South Africa was deeply interwoven into a new economic order. Among other things, it restructured African political authority and consequently transformed the Transkei into a labour reserve. Cobbett (1987) concurs with Beinart (2003) that changes in forest access touched the lives and livelihoods of rural men and women across Africa in more direct ways. They posit that majority of Africans in the late 19th Century and early 20th Century relied on wood sources for fuel, timber for building huts, many others utilized forests for crop cultivation and for livestock grazing besides deriving medicine from the forests. Colonial interlude would put restrictions on forest use.

Contrary to assertions by Ndege (1987), Onduru (1992) and Cokumu (2001) reveals that the advent of wage labour saw women being left behind to take up home duties, however, was not the case with the shamba system. In concurrence with Cobbett (1987) and Beinart (2003), findings from oral sources revealed that forest access touched the lives of both rural men and women in equal measure. A KII informant named Daniel in 2018 refuted the narrative that women were left behind as men went to the forest to work. He contends that women were part of the working labour force in the forest in that they worked alongside their husbands in their respective forest plots. He opined that: *“Both women and men were allocated plots in the forest and they worked jointly. Formal employment such as provision of security however, was dominated by men”*. With findings from the field revealing that the shamba system was a joint venture that involved men and women, it was inferred that the proximity of forests to the locals made it possible for families to travel and work then return in the evening.

Colonial forestry created employment both for settlers and Africans with the creation of the forest department. However, the manner in which the forest department was run in terms of recruitment has elicited debate on whether Africans were not qualified or it was done on favoritism that saw Whites dominate senior positions with Africans occupying junior positions. Fastone (2016) reveals that there was a period when the forest department was reluctant to employ Africans in the positions above that of forest guard. The reason the department gave for this was the difficulty in finding Africans who were sufficiently educated to take up the senior positions. On the other hand, Dominguez (2020) criticizes colonialism as being premised upon exploitation of the colonized people. The confinement of Africans to junior positions is attributed to a wider quest of colonial policy that sought to separate indigenous people from their natural environment.

Archival information regarding employment confirms that, in the colonial epoch, administrative and all senior positions in the forest department were held by whites, and clerical jobs were reserved for whites. Casual labour was left for Africans who were mostly men as shown in Table 5.1 below:

Table 5.1: Grading system for forest administrative structure up to 1963.

Job cadre	Salary	Nature
Conservator	£1200	Senior administration (reserved)
Assistant conservators	£600	Senior administration (reserved)
Foresters	£450	Senior administration (reserved)
Clerks	£25	Junior officers (reserved)
Nursery attendants, Security guards field demonstrators and others	£5	Junior officers / most nursery attendants were casual labourers. (Africans)

Source KNA8/8/1921: Troupe Commission

Table 5.1 contains an archival information on grading system in the forest department. The tables show monthly salary for forest workers with respect to various job cadres. The last column shows that some positions were set aside for Europeans only hence indicated (reserved) while junior positions were left for Africans.

On the other hand, the development of wage labour as shown in Table 5.1 attracted many Africans both in Kodera and beyond. This coincided with the period of industrial forestry 1960-1970. As articulated by Fastone (2016), emphasis was put on forestry as the engine of economic development and modernization in developing countries and forest industries were to play a leading role in the economic take –off of these countries. In Kodera forest, locals had two choices as revealed through an FGD session held at in 2018 at Nyawende. They were either to seek for employment in the forest department or they could be self –employed in their respective plots; as farmers who were required to tend the trees as they take part in crop

production which ultimately was their source of livelihood. An informant named Ajwang' in 2018 revealed that those who were lucky to be formally employed in the forest department however, delegated their plots to close family members to cultivate on their behalf.

Majority of employed forest workers subsidized their monthly pay with farming in the same forest. This arose from an FGD session that was held at Awach in 2018 where it emerged that formal employment had to be subsidized with farming because of the low wages that were paid. Subjecting Africans to low cadre jobs just as been observed previously would consequently mean that they were entitled to low wages and this theoretically was an imperial scheme that had led to creation of a link with urban bourgeoisie through taxation (Ray 1977). Regardless of the low wages, it emanated from an in-depth interviews by Jack in 2018 that development of wage labour in Koderia forest attracted people as far as Kuria to work in the forest, some as forest guards while others as nursery attendants and clerks. Studies in the history of forests and forest management by Holmes (1975) concurs with our findings on forestry accentuating the rise of wage labour in the period 1958 by noting that, The Zuckerman Report of 1957 concluded that, with the advent of nuclear weapons, expansion of forestry for reasons of defence strategy could no longer be justified. In the year 1958, there was thus a ministerial statement which reduced the emphasis on creating reserves of standing timber and gave greater weight to economic considerations and to social benefits of tree planting through diversification of forest employment in Britain and her dominions.

Still on the shamba system and the rise in wage labour, South Nyanza District Development plan of 1984-1988 shows that Rural Afforestation Extension Scheme (RAES) was introduced in Koderia forest in the year 1971 to accelerate forestry extension and rural afforestation. The major

undertaking of the scheme was opening and maintaining of tree nurseries and carrying out rural afforestation work. This eventually contributed to the spread of exotic tree seedlings to the people which was estimated at 60,000 seedlings in 1971 to 500,000 in the year 1982 (KNA/NBI/F6/2/South Nyanza District Development Plan 1984-1988). The rise in the production of more seedlings in the period 1971-1982 saw a surge in employment of more nursery attendants and field demonstrators as espoused by an informant named Ondeyo in 2018. He asserted as follows:

“That scheme made the forest department to employ more nursery attendants. It came also with other benefits like the establishment of rural development fund in the year 1975 which funded 41 cattle dips in our district”

Further in –depth interviews by both Ananga and Ondeyo in 2019 who were former forest workers revealed that from the forest employment, they were paid salaries and wages that averaged £ 15 per month. That helped them pay school fees for their children. They mentioned some of their colleagues such as Ong’ou Gomba who worked as a security guard, Opiyo Mbuya (tree attendant), Ananga wuon Ougo (forest guard). Wages from the forest helped them acquire valuables such as bicycles and herds of cattle among other things. The change in economic status made them to be regarded as rich by their neighbours even though there was a wide disparity in terms of payment when compared with other members of staff in the forest department.

Amatsimbi (1993) observes that poor remuneration of Africans was occasioned by the fact that the colonizers’ ultimate objective was to convert an African into a worker. Through this, colonialists were believed to be performing a fundamental and rare service to humanity. That poor remuneration of Africans in Kodera forest was articulated by Ray (1977) in another context as a mission of capitalism that entailed restructuring the local farmers as full time commodity

producers with low wages. Some Africans in Koder forest were formally employed though with meagre pay. This requires further research even though theoretically, as espoused by Ray (1977), this was meant to commit workers. Nevertheless, allocation of plots for farming represented new changes in forest access which touched their lives and livelihoods.

5.5 The shamba system as an agent of Introduction of new tree species and Transformation of African Technology in Forest Establishment in Koder forest

Technology, as Beinart (2003) reminds us was crucial to colonial ideology and indeed it played a key role in transforming society and the environment. For instance, without fundamental changes in technology and agricultural system as James (1999) confirm, great Zimbabwe was going to destroy itself due to sustained droughts and tsetse fly devastation on their cattle economy which seemed to be one of their essential economic pillars. Transformation of African technology was further evident as Beinart (2000) asserts that the commercialization of palm oil in the 19th Century in the coastal West Africa led to the removal of some older forest cover and the establishment of new plantations. Apart from West Africa, he further asserts that in the period 1940-1960 scientific prescriptions were introduced in Malawi with an example being community forest schemes. The bone of contention here therefore is to ascertain whether tree planting was geared towards achieving a European narrative of a proper land use or because there was an absence of vegetation in Africa or whether European species and technology were regarded as superior to African ones.

On the introduction of new plant species, both Cosby (1986) and Williamson (1996) contend that exported plant species proved to be more powerful than those from the periphery which were inferior. Moreover, in the 19th and 20st Century, the pattern of colonization and trade meant that introduction of plant species were predominantly from the Metropole. In Koder forest, oral

account by Ananga in 2019 confirmed that the shamba system contributed to the introduction of new tree species. Notable species included: eucalyptus, cedar, cypress, and bamboo. The introduction of new plant species is in concurrence with Beinart (2000) on the need to have commercializeable plant species as oral information by Mechizedeck in 2018 further confirmed that colonialists laid much emphasis on eucalyptus because most of its species had a rapid growth rate particularly blue gum (*E. Globulus*). Blue gum was initially used for railway and industrial fuel among other uses (KNA/NBI/F6/2/South Nyanza District Development Plans 1979-1983). It can be inferred from this debate of plant transfer phenomenon from the Metropole to the periphery is a gray area in academia. However, evidence abounds that prior to the onset of colonization, Africans had forests in which there were trees as evident from chapter four of this work. Therefore, the narrative held by Cosby (1986) that African vegetation might have been inferior is unhelpful. This is due to the fact that imperialism was premised upon colonization of African people and their resources as articulated by Beinart (2000). Colonization of our trees was not an exception and this does not relegate African trees as inferior because they satisfied African demands in the pre-capitalist system.

As the introduction of new plant species continued, eucalyptus emerged as one of the most sought after plant by the colonial administration. Chen (2017) affirms that the introduction of eucalyptus to East Africa was driven by the need for a fast growing wood source for fuel would facilitate expansion of the railroad in Australia. Mayr (1965) while commenting on plant transfer concurs with Chen (2017) that Australian eucalyptus was identified as a quick growing species. Archival information on timber concessions and timber trade in the period 1951-1963 reveals that the gradual and systematic introduction of new tree species into the colony led to classification of forests into two (KNA/NBI/3/11/14). The first category was referred to as major

forests while the second category was referred to as minor forests. While major forests were the forests that were regarded to be of much benefit to the colony in that they consisted of purely fast growing exotic trees that could be sold to outsiders after meeting local requirements, minor forests comprised native trees that existed in small patches of natural forests which were of local benefit only and were regarded as being of no special concern to the colony as a whole. Ray (1977) and Berman (1985) observe that in a capitalist society massive entry of capital through economic antagonism demolishes local production thereby creating rural proletariats who are displaced from ownership of modes of production. Since forests were a major means of production during the industrial forestry era 1959-1970, major forests were given more emphasis due to their economic viability when compared to minor forests. Oral information from Peter in 2018 revealed that the colonial forest categorization in terms of timber production still persists and is evident by planting different plant species of different plots.

On the other hand, settlers who came to Kenya have been described as moneyed people by Fastone (2016). Therefore, forest protection and afforestation as articulated by Beinart (2000) were pursued largely to ensure that the interest of both settlers and colonial administrators in timber protection and extraction could be sustained. With regard to the introduction of exotic tree species, strategic species of timber were identified such as eucalyptus. However, from the archival reports, colonial projections on the future of the timber industry was on bamboo tree. (KNA/NBI/115/37/64).the colonial administration introduced bamboo in Kenyan forests majorly because of the need for bamboo pulp for industries. Further reasons for the introduction of bamboo included: first, they (colonialists) weighed the prospects of success in the enterprise in Kenya when compared to Burma, which had registered success. Secondly, depending on bamboo imports from Burma to Kenya through Mombasa port proved expensive. In one of the

colonial correspondences through a letter from the Conservator to foresters, the desire to establish bamboo plantations were captured as follows:

“...I have framed a very rough estimate in respect of one of the most accessible bamboo areas, which, however, I am not able to publish since I was unable, with the limited time at my disposal. Manufacturing and delivering of bamboo pulp at the coast of Mombasa at a cost between £13 and £14 per ton would be expensive”. (KNA/NBI/115/37//64/)

The colonialists went ahead and established pulp industries in Njoro, Kikuyu and Kinangop. Bamboo from all over the country would be transported to either of these areas. A Key informant named Selina in 2018 revealed that *modi* as they refer to bamboo in the local language, was found to be quite beneficial in various ways. It was found to be strong hence many people preferred it for building purposes than the indigenous trees. They would also plant it on the banks of rivers such as Awach and Agido to prevent erosion.

Amatsimbi (1993) opines that the Tiriki people adopted British crops because they possessed high cash value when compared to traditional crops. In concurrence with this, Berman (1985) observes that, generally, the adoption of new seedlings from the Metropole due to their high cash returns at the expense of indigenous ones was a subordination aspect of capitalism which describes the process through which a capitalist mode of production, in this case the shamba system and the exotic forests, were cherished and later adopted because of their returns in the market. These findings partly concur with an informant named Syprose in 2018 who revealed that although new seedlings were introduced such as eucalyptus which has been observed, growing of indigenous trees continued because some were medicinal in nature. This is one area that marked the first step in the articulation of modes of production theory whereby the capitalist system aligned with the pre-capitalist social formation for its advantage. Medicinal trees served both the colonial administration and locals hence there was need to conserve some medicinal

trees. Furthermore, as much as new seedlings were adopted because of their high returns in the market, indigenous reproduction continued because self-regeneration of plants was experienced even with the rise of empire building.

Similarly to bamboo, an immense interest was shown in cedar trees. In the respective forest orders and circulars of 1958-1963 (KNA/NBI/3/11/), colonial administration continued to push for an agenda to grow their own cedar for pencil manufacture. Cedar trees since colonial inception in East Africa was significant because it was the only sole supplier of pencil cedar within the British Empire. Colonial administration had projected that future supply of American cedar (*Juniperus virginiana*) was by no means assured. The projected rise in demand for cedar trees called for certain measures such as: prevention of wasteful use of cedar in building, fencing and other uses, setting aside suitable tracts of land for growing of cedar trees with care in the selection of such lands taken first to ensure wood for the best quality for pencils is achieved, second to ensure cheap extraction and thirdly setting aside extra funds to supervise cedar production. Ray's (1977) observation of the domination aspect of capitalism concurs with the findings from this study which observed that partitioning of forests and massive entry of capital in tending cedar subdued local timber production and regeneration thus creating rural proletariat which consequently displaced locals from timber trade that was monopolized by the forest department. Oral accounts confirms that Koderia forest was indeed partitioned into various plots each designated for a particular species of tree with cedar trees grown on the upper side of Awach river heading to Mititi School. This partitioning or zoning was confirmed through observations where an informant known as Peter in 2018 testified that:

“Colonial administration preferred such partitioning for various reasons: first to control the spread of diseases, second to ensure close supervision and to make harvesting convenient”.

While confirming our position that the colonial administration created rural proletariat by monopolizing timber trade, colonial forest research by Otieno (2008) and Corbetts (2009) and Fastone (2016), affirm that colonial exploitation was transnational, extensive and capitalistic in contrast to pre-colonial demands. For instance, they point out that colonial forestry imposed severe restrictions on communities that previously had almost unrestricted access to forest land. Corbetts (2009) specifically describes colonial forestry as ‘green imperialism’ that sought to transform peripheral forests through technology.

As Berman (2003) asserts, technology was central to colonial ideology and played a key role in transforming society and the environment. Cosby (1986), Williamson (1996) and Tomlinson (1998) and contend that some alien plants were introduced accidentally with agricultural crop seed. Various aspects of technology were soon introduced such as: Gardening which encouraged the growth of plants which could reproduce from their root system. Introduction of tree weeding through the shamba system and rotation of trees which has generated a lot of debate. This is occasioned by the subjective definition of the terms weed and weeding whereby a lot of African crops were regarded as weeds.

Mayr (1965) observes that terms such as weeds and weeding are essential but problematic categories in exploring process of plant spread which consequently led to self-regeneration of African plants. Other scholars like Rival (1995) stress the importance of economic interest and cultural perceptions in determining whether species are defined as useful plants or weeds. Cosby (1986) precisely asserts that the term weed as plants that are not useful to people and outcompete others and are alien in the area where they are found. In Luo culture, weeding of crops existed and weeds were known as *buya* while weeding was known as *doyo*. As articulated by an

informant named Ondeyo in 2018. Beinart (2003) further confirm that African literature reveals that many environments were managed through thinning or loping indigenous species by cultivation for example people adapted to plants that thrived well.

African technology in forest management was transformed through the application of the shamba system in Koder forest. However, in the pre- colonial period Africans did not plant trees rather but trees regenerated on their own and they would only be tended when they had overgrown depending on the purpose they were meant to serve as revealed by Kefa during an in-depth interview in 2018. Transformation of African technology is articulated by Ray (1977 as the process of modification of the capitalist mode of production to suit their quest for mass production. Colonialism further introduced research as an aspect of technology as demonstrated by Cosby (1986) in identifying suitable trees species of tree to certain conditions as illustrated in their administration's plan of work shown below:

'Although forest research has not been placed on an organized basis, a good deal of knowledge has been acquired as a result of experience, particularly in methods of raising plants and forming plantations. A great deal of useful work has been accomplished in regard to the botanical identification of trees and shrubs of the colony by Mr. Battiscombe a keen botanist' (KNA/NBI/1/48/)

Apart from research, a key informant named Lucia revealed in 2019 that colonialism emphasized the adoption of rotation of both crops and trees. Crops and tree seedlings were planted in straight lines contrary to broadcasting method that was initially used, tree seedlings were first laid in a seed bed in tree nurseries to mature. This featured prominently in their various annual reports of the forest department where emphasis was on achieving a double objective of increasing production in the forest department besides ensuring adequate forest management. Rotation, for instance, resulted in a considerable increase in the African production of foodstuffs (KNA/NBI/F8/3/). In a bid to contextualize the dynamics and realities of shifting cultivation in

pre- colonial Kenya, Anderson (2002) and Fastone (2016) concur that, as from the 19th Century, the colonial forests in the tropics were organized according to European models and intervention in the production process became one of their primary endeavours, this they did through promotion of commercial agriculture and forestry projects through a forest management model known as the shamba system which entailed both crop and plant rotation . The table below shows revenue and expenditure during the first and second rotations:

Table 5.2: Table of first rotation of trees in Koderia forest

YEAR REVENUE		EXPENDITURE
1957-1960	390,000	750,000
1961-1965	950,000	750,000
1966-1970	1,062,000	775,000
1971-1975	1,158,000	750,000
1976-1980	1,910,000	750,000
TOTALS IN £	6,250,000	5,650,000

Source: *KNA/NBI/F8/3/Forest Department annual reports: 1960, 1965, 1970, 1975 and KNA/DC/Rachuonyo/District Development Plans/F6/2/1979-1983.*

The following were inferred from Table 5.2. There was an increase in forest revenue. This was attributed to a well-managed shamba system in Koderia forest. During this period, farmers were not charged subscription fee in order to be allocated forest plots.

Table 5.3: First fifteen years of second rotation in Koderia forest

YEAR	REVENUE	EXPENDITURE
1981-1985	875,000	3,390,000
1986-1990	875,000	4,390,000
1991-1995	875,000	4,390,000
TOTALS (£)	2,625,000	12,170,000

Source: *KNA/NBI/F6/2/Rachuonyo/District Development Plans/1979-1983, 1984-1988, 1989-1993, 1994-1996.*

The following can be inferred from Table 5.3. First, there was a decline in forest revenue as compared to expenditure in the successive years from 1981-1995. This was attributed to the following: The Structural Adjustment Policies that were adopted as from the year 1980s to address the balance of payments affected the forest department in that personnel in the forest were reduced through retrenchment and with a cut in forest funding, the revenue in the forest reduced (Mwangi, 1998). Corruption contributed to this decline since allocation of plots by subscription at a fee of Ksh. 700 was resisted by most residents and these compromised conservation measures. This emerged from the FGD session that was held at Awach. Ofcansky (1984) concurs with the position in his thesis that, in the post -independent era, management of forests in Kenya dwindled due to corruption. This was attributed to financial starvation of the forest department through structural adjustment policies. A key informant named John in 2018 testified as follows:

'Our salaries used to delay especially in the 1980s then suddenly people were retrenched. The forest department had to spend more money to establish forests because the work force that remained was inadequate. Due to inadequate funding, some individuals started to charge fees for the forest plots. Consequently farmers neglected tree seedlings and instead prioritized their crops.'

The testimony above on delayed payment of forest employees and general starvation of the forest department led to the conclusion that such delays signified the commencement of forest plundering during the environmental forestry era which was evident by the rise of the civil society led by Wangari Maathai who championed the proscription of the shamba system for having exacerbated deforestation which is discussed in detail in the next chapter.

5.6 Conclusion

This chapter analyzed the role of the shamba system in bringing about economic change in Koderia forest. Forest as an institution informed the economic organization of the locals in that

they practiced hunting and animal keeping alongside farming. In pre-capitalist Koderia, trees regenerated on their own. This self-regeneration was however, overlooked by the colonial administration, nevertheless it was adopted alongside plantation method of trees that was introduced. Moreover, shamba system moreover saw the transformation of Koderia forest from public to private tenure system with user rights being curtailed.

On the other hand, contrary to the narrative held by scholars of economic change notably Ndege (1987), Onduru (1992:2009) and Amatsimbi (1993) that migrant labour alone led to change in social roles in that women were left behind to take care of home chores as men went to look for jobs. In the shamba system practices both gender were actively involved due to the proximity of the forest to the locals. The historical analysis on the rise of migrant labour in forests was enhanced by the Zuckerman Report of 1957 which triggered forests to offer social benefits through diversification of employment. It was observed that people came from other districts to look for employment in the forest for wages and salaries. It was, however, noted that there was favoritism in employment with senior management positions being reserved for whites while others were reserved for sons of colonial chiefs like composition of clerks, Africans were employed in lower cadre jobs. Finally, African knowledge in tree establishment was transformed by the introduction of new methods of tending trees. However, it was observed that colonialism entailed not only colonization of people but also their plants and technology. Plant transfers from the Metropole saw the relegation of African breeds at the expense of promoting exotic breeds. It was concluded further that plant transfers and the introduction of new technology in forest management were agents that facilitated settler colonialism. In the next chapter, we turn to the effect of the shamba system of forest management on Koderia forest.

CHAPTER SIX
EFFECTS OF THE SHAMBA SYSTEM OF FOREST MANAGEMENT ON KODERA
FOREST (1957-2012)

6.1 Introduction

Although they outlived the colonial epoch, environmental policies as Beinart (2000) asserts have been subjected to scrutiny because they have remained central in the development strategies of independent African states and international agencies. The shamba system according to Fastone (2016) was the heart of colonial forestry in Kenya and was significant in forest plantations. In contrast to Fastone (2016), Anderson (2002) observes that the shamba system had a turbulent post –colonial history. It is this set of contradictions in the application of the shamba system that informed the analysis of the effect of the shamba system of forest management on Kodera forest. This chapter has delved into the effect of the application of this policy by assessing its success and failures in both colonial and post- colonial era with the latter era being described as the era of environmental forestry which was the ‘threat to Kodera forest’.

6.2 The Concept of Management

According to Food and Agriculture Organization (1990), management of a phenomena refers to its control and regulation. In so far as forest resources are concerned, management is central to the objective of conservation since the utilization of resources depends on the way they are controlled. Forest resource management is concerned with ownership, the right to use the resource and the right to determine the nature and extent of use by others. In this respect, Kenya’s environmental management and coordination Act (Forest Act, 2005) defines environmental management to include the protection, conservation and sustainable use of the various elements or components of the environment. Kenya’s Forest Act makes reference to the issue of sustainable forest management as the management of the forest so as to permit only such use in so far as sustainable use is concerned. The Forest Act defines it to mean the use of a forest

and any of its natural resources in a manner and to an extent that does not compromise the capacity of the forest and its use by future generations and does not degrade the carrying capacity of the supported ecosystem. In this thesis, management of the shamba system was geared to solve forest trouble that was conceptualized into the following parameters: Fire, boundary demarcation, squatter problem and related issues and illegal logging.

6.3 Effect of various legislations and policies on the shamba system of forest management in Koderia forest 1957-2012

In a bid to ensure proper management of forests, various policies have been put in place due to the fact that, until the year 1957, Kenya operated with informal forest policies. This means that the first forest policy was the White Paper No 85 of the year 1957. It reiterated forest preservation policies of the government. It also set out the colonial government plan of creating forest reserves to meet national and export demands for timber and other forest products besides putting all forests under the control of the government (GOK, Sessional Paper No 1, 1968).

Consequently, the White Paper of 1957 and other colonial policies had various effects on forest management. For instance, Matiru (2002) opines that colonial laws were preservationist in nature. This means that they sought to protect forests from traditional management practices. This was confirmed in chapter five of this work where it was established that new technology in forest and tree establishment was introduced to replace broadcasting and self-regeneration of trees. Moreover, colonial laws were geared towards the generation of revenue for the forest department through sale of timber and other forest products (Mwangi, 1998). Ofcansky (1984) notes that the White Paper of the year 1957 limited access to state forests which were controlled by forest guards and only permitted activities that were permitted by the colonial government. A key informant named Ong'ou in 2018 concurred that colonial forest laws limited access to the

forest for the locals in various ways. For instance, communal hunting was discouraged besides gathering of traditional herbs.

Post –colonial policies on forest management just like colonial laws focused on protection of catchment areas, development of industrial forestry, and protection of forests from encroachment by local communities (Ofcansky, 1984). These policies were discussed as follows. In the year 1964, a forest Ordinance was adopted. This law gave the Minister for environment and natural resources immense powers in forest management for example the minister could declare by notice any in alienated land as forest area (Ofcansky,1984). The minister could also declare when an area ceased to be a forest. The law did not give the minister any reason to involve local communities or seek parliamentary approval in his decisions. This led to abuse of his powers and subsequently displacement of many forest communities from their ancestral land besides loss of indigenous forests and forest excisions. This authoritarian aspect in the Ministry of Environment and Natural Resource Management concurs with the South Nyanza District Development Plan of 1979-1983 where orders were placed on land adjudication officers, District Officers and County Council to identify hill tops for afforestation without consulting the residents. The report reads:

‘Forester rural extension scheme will recruit small scale farmers for tree planting .Each farmer shall plant at least an acre of trees. Identification of Hill top areas will be only done by Land adjudication officers, District officers and Count Councils’ (KNA/NBI/F6/2/).

With regard to the authoritarian aspect of the Minister of Environment and Natural Resources in decision making, FGD session that was conducted at Awach in 2018 revealed that Lake Basin Development Authority at Awach, Ombek market and brick laying site at Awach were excised from the forest department following an order from the Minister of Environment.

In the year 1968 further amendments were done to the White paper of 1957. According to Sessional paper No1 of 1968 (GoK, 1968), the law now provided for the need to restore more land for forestry in light of the role of forests in soil and water conservation. It continued to recognize the need for managing forest sustainably to ensure that Kenyans continue to benefit from the forests through farming and other forest products. By this policy, various forests were placed under county councils and managed jointly by the forest department. It further recognized the importance of forests for recreation and wildlife protection. South Nyanza district development plan of 1984-1988 confirms that the 1968 amendment led to the establishment of more tree nurseries in Koderia forest and Hill top afforestation which was intensified through shamba system that was now put under Migori County Council (KNA/NBI/F6/2/).

On the other hand, in the year 1981, a National Food Policy was unveiled (GoK 1981). This policy emphasized promoting food sufficiency and production of crops. This policy had an impact of converting gazetted lands into farming zones and subsequently led to government ban on logging in the year 1982. Sessional Paper No 1 of 1986 which focused on economic empowerment for renewed growth especially in coffee, wheat and tea was unveiled, (GoK Sessional Paper No 1, 1986). Much as the national food policy of the year 1981 was unveiled, contrary to various forests where coffee, tea and wheat were grown, A key informant named Peter in 2018 however, explained that in Koderia forest, food crops such as maize and beans were still preferred to cash crops such as tea and coffee because they matured faster, which meant that they did not compete with planted tree seedlings unlike tea and coffee which were likely to compete with tree seedlings for nutrients thus hindering their proper growth. Retrospectively, an FGD session held at Awach in 2018 revealed that, the 1986 forest policy on economic empowerment and renewed growth together with the 1981 forest policy on national

food policy led to mismanagement of forests in that massive encroachments were experienced in Koderia forest which subsequently led to the executive ban in the year 1986 to resettle communities that hitherto had illegally settled in the forest outside the forest areas. Moreover, archival information during the environmental forestry era reiterated the narrative that forests continued to be under threat from illegal settlement, grazing and logging in spite of the ban on the shamba system. For instance, South Nyanza District Development Plan 1989-1993 confirms that the 1981 food policy affected Koderia forest in that exploitation of the forest was noted without replanting. A visit by the Minister of Environment and Natural Resource Management in the year 1987 gave guidance on the best way to institute a management plan for the forest which encompassed: determining area planted, unplanted and existing block, establishing and enforcement of a standing committee of the forest and procurement of resources to plant vacant and harvested area (KNA/NBI/F6/1/).

In the year 1994 however, the shamba system was reinstated after a pilot programme was implemented in selected forests (GoK, Forestry Master Plan, 1994). This was done in efforts to encourage communal forest management by forest adjacent communities. The ban on the shamba system was lifted because the government could not cope with the backlog of its reforestation program hence further justifying the role of the shamba system in forest establishment and management in Kenya. Rachuonyo District Development Plan of 1997-2001 confirms that Koderia forest had been affected by human encroachment and illegal logging which had occasioned the earlier bans on the shamba system (KNA/NBI/F1/11/). The National policy on water and resource management development of the year 1999 also influenced the application of the shamba system in forest management by recognizing the need to apply management options in forests that are not only participatory but which also provide for poverty alleviation

through supporting the National Environmental Action Plan which was geared towards the general management of the water sector (G.O.K, Sessional Paper No 1, 1999).

A key informant named Peter in 2018 revealed that the years 1994-1999 saw a government attempt to revamp the diminishing forest sector through pilot programs following the 1986 executive ban. Moreover, it was a period in which forest legislations were expected to slow down the forces of destruction both real and perceived and to further increase plantations through Community Forest Associations that were formed. He asserted as follows:

“The more things changed the more they remained the same. Shamba system was weakened by various legislations that were passed in parliament which consequently facilitated deforestation. Planting of trees were not emphasized since the government was basically seeking for political support”

According to observations by the above informant on the effect of forest legislations of the years 1994-1999 on the shamba system, it was inferred that these legislations negatively affected the management of the shamba system in Koderia forest. For instance, the national food policy of the year 1981 and the 1986 forest policy on economic empowerment and renewed growth exacerbated encroachments in Koderia forest.

In the year 2002, a newly elected government reinstated the ban of the shamba system. The arguments that advanced were that the policy caused forest destruction by encouraging squatters to settle in the forests (Matiru, 2002). Mathu (2007) explicates that corruption and outright criminal mentality which has been rife in Kenya manifested itself in the forest management particularly the shamba system. This was witnessed through unlawful marking of forest beacons, use of bribery to gain harvesting rights, and irregular issuance of forest land to repay political favours. Koderia forest was not an exception with regard to Mathu's (2007)

confession. Further revelations by an informant named Peter in 2018 confirmed that the forest experienced increased encroachment by adjacent communities some of whom were ferried by politicians to acquire plots in the forest. He quipped that:

“as from the year 1981 people came from various areas especially Kisii to get plots for farming. Shamba system became a gold rush during this period with little emphasis on tree establishment which earlier was its core mandate” (Peter, 2018)

From these testimonies, it was therefore concluded that the ban of the shamba system by the NARC government could not be avoided. The ban of the shamba system in the year 2004 elicited divergent opinions. One school of thought championed by the Green Belt Movement under Wangari Mathai blamed the shamba system for exacerbated deforestation (Wangari, 2009). On the other hand, proponents of the policy believed that the system was still crucial in tree establishment in state forests (Mwatika, 2013) and (Fastone, 2016). Meanwhile, a ministerial meeting of representatives of African governments and European Commission in Yaoundé Cameroon made a ministerial Declaration on forest law and governance whereby the participants reaffirmed to work together to strengthen institutional reforms in the forest sector. This led to drafting of the forest Act of 2005 (GoK, Forest Act, 2005). This Act recognized and appreciated the importance of forests to the national economy by providing of valuable goods and services. The Act also addressed key factors that undermined government efforts towards achieving sustainable development and management of forests such as illegal logging, financial constraint in the forest department and encroachment. The Act therefore recommended a participatory approach in forest management thereby justifying further the role of shamba system in forest management. In contextualizing the 1986 and 2004 Executive proscriptions of the shamba

system in Koder forest, a key informant Peter in 2018 revealed that the bans failed to accommodate local claims over access to forest and land resources.

From the assessment of these post-colonial laws, a dichotomy of classification emerged. There were policies that played a crucial role in management of the shamba system like the White Paper of 1957 and the forest Act of 2005. The National food policy of 1981 and policy of economic empowerment in 1986 exacerbated encroachment in the forest thus causing a ban of the shamba system. The shamba system still required subsidiary legislation for its operation and its success or failure depended on the nature of the law and the political will for its implementation. Kariuki (2013) confirms that Kenyan law on forestry has been either conservationist or preservationist in nature. Conservationist policies according to him had a human face in that they embraced participatory approach in forest management while preservationist policies tended to leave out forest communities in management.

6.4 Effect of the shamba system on securing and managing of Koder forest (1957- 1963)

Studies in colonial forestry concurs that the shamba system was significant in afforestation in colonial Kenya. Anderson (2002) and Fastone (2016) observe that the shamba system was the heart of colonial forestry in Kenya and was significant in afforestation programs in Kenya. Fastone (2016) further justifies that the shamba system was responsible for setting up of 42% of colonial forest plantations. On the other hand, Anderson (2002) asserts that the shamba system had a stable operation in the colonial period which seems to be looked upon by policy makers in addressing the challenges that has affected forestry in the post-colonial dispensation. It is this set of contradictions regarding the application of the shamba system in both epochs that this study sought to address in this chapter. This is due to the existence of a debate between the civil society led by Wangari Maathai and the Government in the quest for and against the application

of the policy in Kenyan forests which has suffered deforestation and encroachment amidst the application and proscription of the policy. Wangari (2009) criticized the shamba system for exacerbating deforestation while researches by Muchangi (2011), Fastone (2016) and Anderson (2002) hail the shamba system as the backbone of colonial forestry. Oral information confirms that, in the colonial period, the policy helped in demarcation of forest boundaries, fire protection, enhancing plantation of trees and in conducting research. The colonial administration found it cumbersome to locate boundaries where forests adjoin forest reserves but where forest reserves adjoin native reserves, the farm beacons were used and taken to represent the forest boundary marks as explained by Blasto in 2018.

Management of forests in Kenya colony according to Ranger (1987) and Twaddle (1992) became a central focus for the British imperialists due to the fact that colonialism was premised on the desire to ensure control and access to primary resources for industries in Europe, in this case the timber trade. In an attempt to “civilize” the colonized, European concepts of property rights and management were imported into Africa to foster progress along paths that were previously taken by most European countries during the industrial revolution. Berman (1985) observes that the introduction of private property rights in land and tree tenure system theoretically meant that the imperialist geared towards preserving the proceeding modes of production, the capitalist sector introduced the shamba system for their own convenience. The assumption was that, what had worked for Europe could be replicated in Africa. For instance, privatization was super imposed by colonial powers upon existing notions of property rights as a result of misconceptions about the nature and role of local systems in resource management. An FGD session that was held at Nyakiya in 2018 revealed that the introduction of title deeds,

curtailing of local activities within the forest were live examples of private property rights which changed forest access and consequently touched the lives and livelihoods of rural people.

British Empire forestry according to Twaddle (1992) received a considerable attention. A case in point is South Africa where reconstruction leaders especially Alfred Milner high commissioner of South Africa and Governor of Transvaal (1901-1905) saw forestry as a key pillar of reconstruction. He further asserts that Milner sought to irrevocably transform South Africa by setting up scientific principles in forestry to aid agriculture. Milner's scientific principles in forestry through farming in forests fulfilled many of his desires namely: increasing timber production, land resettlement, expansion of agriculture and most significantly increased afforestation in the Transvaal and sustaining timber supply in the mines. Using Milner's success story, this thesis holds that scientific principles/ the shamba system, when properly applied then afforestation programs are bound to succeed. This is the case of Koderia forest when shamba system was 'well' applied as In-depth Interview with Rose in 2018 confirmed that *Ka- Naman* clan enhanced the management of Koderia forest in two ways: first, they settled in Koderia forest in the 1940s and were the pioneers in the practice of the shamba system when they planted sorghum alongside tree seedlings till the seedlings matured. Second, they planted crops that acted as a buffer zone hence shielding the crops blocked the forest from destruction. A visit that was made by DC of South Nyanza in the year 1959 to Bwana Young (Mr. Young) the forest manager by then which he later recorded in his safari diary succinctly describes the benefit of forest farming in helping in the demarcation process in the following ways:

“...Where forest boundaries adjoin farm lands the farm beacons have been taken to represent the forest boundary marks. These however, are small and a more distinct form of demarcation that entails the use of food crops be used (KNA/NBI/2/11)

Apart from demarcation issues on land, forest fires were reported to be a menace to forest protection in the colonial period. Otieno (2008) and Fastone (2016) observe that fire was caused by honey hunting communities in their quest for livelihood. Fire would be set to smoke bee hives suspended on trees and thus could also involve a great deal of labour and staff to put out. Otieno (2008), while in concurrence with Fastone (2016), asserts that tension between colonial officials and Africans in Western Kenya over forests had become commonplace in 1930-1940. Colonial administration feared that African forests threatened by extinction because of burning practices. Archival information confirmed fire as a menace to forest department in the colonial period which caused serious forms of injury to forest and the damage caused by forest fires were reported to have run into a million pounds. Forest fires were reported in Abadares in central where it was attributed to the grazing fires of the Maasai. Other causes of forest fires were the Dorobo and Kikuyu honey hunters who left the fires burning within the forests, or in some cases setting fires in the forest order to smoke out bees (KNA/NBI/F8/3/).

Similarly to other forests, in Koder forest, fire was however, attributed to hunting practices whereby hunters could use fires to chase wild animals like porcupines, the forest department enhanced strict patrolling in the forests to arrest this and in fact forest bells and alarms (signals) were constructed at Mititi hills and God Agulu to relay signals in case of fires. A key informant confirmed that, with time, it was found that fire protective measures were not fully organized and were only effective within a radius of a small forest station. Such forest fires at Ombek could not be signaled at Mititi. This called for the application of the shamba system policy as asserted by a KII informant named Daniel in 2018. This later demonstrated its effectiveness in forest management. An annual forest report on the effectiveness of the shamba system in forest

management concurs with data from KII revealing that the shamba system played a role in addressing forest fires. The report reads in part:

“...in dealing with outbreak of fire, the presence of labour on the spot is a valuable asset. When plantation work is fully organized then presence of cultivators in the fields should constitute an important safeguard against forest fires. When such plantation work is carried out on a large scale some effective methods of safeguarding cedar trees from fires is realized” (KNA/NBI/F8/3/forest department annual report 1958)

As from the year 1957, the forest department exerted the highest level of control over its workers. This is due to the fact the White Paper of 1957 officially brought Kenya’s first documented forest policy into the fold (Otieno, 2008). The highest level of control was indeed necessary due to the fact that the scientific ascendancy in forest management era commenced as from the year 1957, (Fastone, 2016). Therefore, this needed restructuring of farmers as full time commodity producers and further rendering them as proletariats. Ray (1977) observes that this theoretically meant that rural proletariats had been established but deprived ownership of the forest as a means of production by the formulation of the policy hence they resorted to criminal activities in the forest as a source of their livelihoods. However, the application of the shamba system as from the year 1957 saw a reduction of forest and related cases such as: theft of forest produce and damage caused to tree seedlings during grazing of animals and wild fires. The trend in reduction of these cases are shown in Table 6.1 below:

Table 6.1: Records of prosecution of forest offences in Koderia forest 1957-1963

YEAR	NO. OF OFFENCES
1957	1224
1958	967
1959	928
1961	841
1960	764
1962	640
1963	443

Source: KNA/NBI/3/1/ Forest Department Annual Reports: 1963

From Table 6.1 above, it was inferred that as from the year 1957, the forest department witnessed a rise of a number of offences in Koderia forest. Two oral informants, Joel & Phoebe in 2018 reported that it was partially a year of drought and drought conditions precipitated and created ideal conditions for fires. Apart from forest fires, others were arson and uprooting of trees by herders. When the White Paper fully came into force, forest offences reduced over the years as demonstrated in the table. Studies in forest offences in colonial Kenya in Chapalungu forest reveal the fact that the trend in the offences were on the verge of surge after the Second World War due to economic meltdown that was witnessed (Otieno, 2010).

Earlier forest Ordinances such as in 1902, 1911 and 1941 were used in forest administration up to the year 1963. For instance, activities relating to forest exploitation grazing inside the forest were all classified under the 1902 Forest Ordinance. Meanwhile, Forest Ordinance of the year 1911 which was repealed in the year 1941 was significant in the classification of forest offences and the specified punishment, (KNA/VF/3). From the forest orders and circulars of the years 1958-1963, it emerged that honey hunting was the greatest forest offence because honey collectors would use fire to smoke beehives on trees. It therefore attracted heavy punishment.

The following table shows a list of forest crimes and offences in the years 1958-1963 in Koderia forest.

Table 6.2: Table of forest offences and crimes in Koderia forest 1958-1963

Forest Crime	Fine in Kenya shillings.
Grazing	5
Fuel theft	6
Honey hunting	20
Hunting in the forest	10

Source: KNA/VF/Forest department orders and circulars 1958-1963.

Apart from security issues, the shamba system in Koderia forest availed land besides addressing squatter issues. Wahome (2020) justifies the role of the shamba system in availing land to squatters by asserting that a large population of landless people were banished from Mount Kenya forest in the 1990s as a way of preserving the water tower. The population settled just outside the forest vicinity which came to be known as *muroto*. These settlements became ideal as the former forest squatters could go on with shamba system activities in the forest without breaking the law. An FGD session that was held in Kamiyawa in 2018 was in concurrence with Wahome (2020) where it was observed that various families were mentioned to have been settled in the forest helped in the management of the forest through the shamba system.

The importance of land to forest communities is further confirmed by Sessional Paper No3 of 2009 which states that ‘Land is a crucial category of property, a valuable source of livelihood and a material wealth, which forms a significant aspect among Kenyan communities’ (GoK, Sessional Paper No 3, 2009). Mbote (2013) observe that land is particularly important to forest communities since they derive their livelihoods from the forestlands and it is linked to cultural, socio-economic and political organization of a people. Since forests are based on land, this study

argues that the shamba system availed forestland to Kibera locals for their continued practices much as it played a key role in transforming tenure system from public to private land holding system as articulated by Berman (1985) whereby traditional forest practices such as herbal extraction existed side by side with shamba system practices.

From the foregoing discussion, it is clear that the shamba system was not a profligate but a core mission in colonial forest management. Oduol (1986), Fastone (2016) Vanleeuwe (2003) and Anderson (2002) and jointly concur that the shamba system became the core of forestry operations in colonial Kenya. The success of the shamba system in Colonial Kenya was hugely influential in advancing the ability of the forestry department to meet its goals chiefly tree establishment for timber trade besides playing a role in environmental conservation. With the shamba system success in the colonial era, antagonists of the policy through the Green Belt Movement in the post- independence period criticized the shamba system for exacerbating tree loss. This formed a core discussion in this chapter.

It is worth to note that archival information attest to the fact that the shamba system was responsible for efficient forest management in Colonial Kenya. The policy led to various achievements namely: establishments of tree nurseries at Kibera Awach, Lambwe and Homa Bay. This led to an increase in the production of seedlings tremendously from 60, 000 in the early 1960s to about 500,000 in the year 1982. This would later culminate in an increase in forest plantation acreage. It should be noted that forest stations also increased with most of the necessary facilities being established at Kibera, Wire and Lambwe valley with a large District Forestry Office built at HomaBay in the year 1982 (KNA/NBI/F6/2).

Reidar (2003) reveals that the Industrial forestry era was witnessed in the period 1960-1970. During this period, emphasis was put on forests as the engine of economic development and modernization in developing countries. Forest industries were to play a role in the economic take-off of these countries. The outcome of Industrial Forestry were deemed successful during the initial phase. Industrial Forestry practices would be felt in Koder forest where a KII named Ong'ou in 2018 confirmed that the increase in seedlings in the year 1960 consequently, led to rise in trade in tree seedlings which in turn enabled them to plant more trees. This was confirmed through an observation that was made in his private plot that he set aside for seedling tending which acted as a demonstration field for his neighbours. He opined that:

'The skill of seedling tendering in nurseries wa introduced unto us. We were able to tender our own seedlings and sell in Oyugis, Magungu and other local markets around'.

Similarly, further effects of industrial forestry were confirmed through an FGD session that was held at Awach in 2018 revealed that the aftermath of industrial forestry went beyond 1970. It was established that the period 1971-1980 saw a very efficient management of Koder forest which emanated from industrial forestry practices such as establishment of rural afforestation schemes with an estimated plantation acreage covering 100 hectares on some ten hills but this would suddenly change in early 1986 due to the ban of the shamba system. This concurred with data from KII which demonstrate that planting earlier stopped some time in the year 1982 while exploitation continued. This occasioned an executive order in 1986 which banned the system. Moreover, revelations from in-depth interviews from Lencer & Otieno in 2018 showed that the forest department was blamed for soliciting money before plots were allocated. Consequently, people who had already been allocated plots resorted to killing tree seedlings and intensifying

farming of crops. From the foregoing discussion on the effects of industrial forestry which was occasioned by the application of the shamba system in Koderia forest, efficient management of the shamba system was marked and ended by the industrial forestry era. Post- industrial forestry would usher in the Environmental forestry era of 1980-1986 which witnessed large scale forest clearing as asserted by Reidar (2003). This was discussed under post -colonial management practices that threatened Koderia forest.

6.5 Effect of the shamba system of forest management in addressing the squatter problem

Studies by Ogendo (1991) and Kamau (2013) concur that the foundation of the law of property in Kenya is traceable to customary land law tenure and colonial administration. They point out that, before the introduction of formal laws, land management was guided by customary rules as, this even in the forest regions ensured sustainable forest management. Land belonged to the community and each person had rights of access to land based on his needs. Social and cultural life of each community was important in influencing tenure system and property relations in general. Property and resource tenure rights such as land in traditional African society comprised “a web of interests” whereby different parties had a right to use, regulate and manage a resource based on the norms and rules of a society (Kamau, 2013). The colonial interlude through the shamba system would later change this practice by formalization of property rights that eventually cut the web of interests. This impacted negatively on traditional land tenure system hence loss of land which consequently led to the rise of squatters, (GOK, Sessional Paper No 3, 2009). In concurrence with Ogendo (1991) and Kamau (2013) an elder Ong’ou in 2018 who was interviewed in Dholuo language, quoted verbatim and translated into English, narrated the history of Koderia forest before the adoption of the shamba system as follows:

“Up to 1950s, this forest used to be a community land before European occupation, some people with cattle could graze in the forest, and other people practiced hunting and gathering. Later some members of the community engaged in millet and sorghum farming on small scales basically for domestic consumption. This was a no body’s land since all of us owned it. Some of our cultural practices were conducted here” .Then wazungus (British) cheated us that they have a program that was geared towards eradicating a dangerous fly that caused Nguku (disease) disease upon stinging a person.

As already established from KII another informant named Atanga in 2018 espoused that treachery was employed to acquire Koderia forest land that earlier belonged to the community. Resultantly, it created hostility between the forest management and the residents. All in all, the shamba system addressed this form of hostility by economically empowering the residents. Since 1957, the residents have supported forest policies and this salvaged the forest from destruction. This however, changed when corruption crept into the management system in 1980 leading to the abolition of the shamba system in the year 1986 through an executive order (Oduol, 1986).

Koderia forest appears to be troubled by the squatter problem that arose in the colonial era which was addressed succinctly through the shamba system. This emanated from in-depth interviews from Mary & Ruth in 2018. The informants asserted that several families have been staying in the forest land claiming that the land belongs to their forefathers. Such families include: Naman Magak, Oruko Kobo, Akumu-Owino and several families around God-Agulu hill. The colonial administration allowed them to settle there as long as they planted trees. Most settlers were however employed by the forest department. The primary duty of settlers employed by the forest department was to establish plantations in the forest, repair and maintain the existing plantations as well as assist the natural regeneration of indigenous trees by clearing weeds besides prevention of fire.

Attempts by locals through Local Native Council to be allowed to graze in the forest were, however, declined by the District Commissioner of South Nyanza in the year 1958, (KNA/NBI/DC/SNYZ/). In concurrence with Ray's (1977) observation of capitalist alignment with non- capitalist mode of production, it was observed from this study that the colonial policy of accommodating settlers in the forest so long as exotic trees were planted was the gradual alignment of the non- capitalist mode of production with capitalist mode of production whereby settlers were engaged in mixed farming in their own plots besides tending exotic trees for the advantage of the capitalist colonial administration who would consequently reap big from the timber products.

Retrospectively, in a bid to ensure closer supervision and management of the shamba system, the forest department embraced the recruitment of settlers to supervise the shamba system in the year 1959, (KNA/NBI/1/5/). Amoah (2009) confirms that this form of recruitment had earlier been employed when the shamba system was applied in Burma as early as 1860. Within Burma, the recruitment of Karen squatters as forest workers consequently, converted them from potential enemies of forestry into key allies and loyal servants.

Anderson (2002) further observes that the shift to recruit forest guards from the squatters was an element of indoctrination of squatters and locals to the principles of forestry in Kenya. The colonial government wanted believers in the doctrines of forestry and squatters were believed to possess the prerequisite requirements. Evidence from Koderia forest contrary to the Burmian case where settlers were recruited due to their ability to mobilize locals into the shamba system engagements however, oral informant Ruth in 2018 confirmed that settlers were recruited due to their loyalty to the colonial administrators on the ground who were their immediate supervisors.

The recruited headmen were essential in the management and success of the shamba system in the colonial era in Koder forest. From the observation made from the field, it was further confirmed by an informant Wilson in 2018 that indeed the trees that were planted in the 1950s and 1960s by settlers and locals through the shamba system still stood to date and the burial sites that confirmed that these families have stayed in the forest for quite some time. The informant asserted as follows in Dholuo which was translated to English:

“Our fore fathers such as Magak, Naman, Oruko, Kobo, and Akumu- Owino were all born here. Both the mzungu and the African Governments have from time to time engaged us in farming in this forest which has seen both the application and proscription of the policy’.

Further interrogation on the current security status of the settler’s settlement confirmed that these settlers in Koder forest have no titles to the land they own since the land on which they stay has since been converted to government land many years ago. This arose as result of the *nguku* epidemic that finally forced them to surrender the forest to the colonial administration as confirmed by an informant Wilson in 2018. This thesis brought forward two dimensions in forest management: preservation and conservation. According to Kamau (2013), preservation entails protecting forests by limiting access to forest resources while conservation ensures access to forest resources when protecting the forest. The shamba system succeeded in the colonial period because colonial laws were conservatory while post –colonial dispensation embarked on preservatory principles. Koder residents earlier embraced the policy because it factored in their interests but rebelled against forest management practices from the year 1980. This period was known as Environmental forestry era. It was marked by forest exploitation without planting. This

explains why the post –colonial period in forest management in this thesis was referred to as the threat of Koderia forest. Studies by Anderson (2002) concurs with the assertion that the post - colonial period was a threat to forest management because of the manner in which politics infiltrated in the quest for a better forest. He asserts that the shamba system has had a long and turbulent post-colonial history. The assertion by Anderson (2002) on the turbulent nature in the post –colonial forest management was finally confirmed by the testimony of an elder named Akumu in 2018 who opined that:

“This policy has experienced challenges because of the land issues that have not been solved since independence. We have planted many tree seedlings in Mititi, and God Agulu. The people burned over 40,000 tree seedlings. Without the policy may be there can be proper tree establishment. Strict laws that have accompanied the cultivation policy has denied people enough land for farming. Some people have gone ahead to uproot tree seedlings feeling that they pay more to acquire these plots. There has also been a feeling that outsiders such as jo-Kagan, jo-Kisii and jo- Kotieno have also benefited from these plots at the expense of the locals. To me these are some of the issues that once sought then our forest will be better”.

This study argues that colonial laws transformed land tenure and ownership system in Koderia forest. As noted from the above set of interviews, colonial policies such as the shamba system policy however, had serious effects on landholding and forest management that were communal by nature, the policy empowered the residents by ensuring adequate food sustenance. Kariuki (2013) argues that due to the multiple functions, services and benefits that forests and trees provide to mankind, a concept known as forest tenure has since been coined. This concept includes ownership, tenancy and arrangements for the use of forests. It also determines who can use what resources, for how long and under what conditions.

This study demonstrates that conservation efforts that includes the shamba system in Koderia forest since colonial period were reconciled with the community land tenure systems that had

been in place from the pre- colonial to post- colonial times and this is the case of *jo- Kanaman Magak, jo- Kabok* and several clans that laid a claim to Koder forest as their ancestral land. A key informant named Wilson in 2018 revealed that, in contrast to other clans who owned parcels of land elsewhere such that once they were evicted they moved in with speed to settle, these families fully relied on the forest for settlement and livelihood. They were accommodated in the forest after which the shamba system was introduced to modify the forest through exotic trees, a process which saw the destruction of their traditional forest management practices like self-regeneration of trees. Finally, they were subordinated through policies that limited their freedom in tree extraction as espoused by Berman (1985). It was therefore inferred that these clans were forced to work as laborers in the forest for livelihood and to pay tax.

6.6 Effect of the shamba system of forest management on Koder forest in the post-independent era 1963-2012

Anderson (2002) observes that, in the year 1964, all European senior foresters were given notice of the end of their contracts that was effected in the year 1965. This resulted into rapid change in management that was spearheaded by Africans. However, archival information reveals that, in spite of the termination of European contracts in the year 1965, the forestry sector still exhibited a reliable fauna that was hunted to feed the bellies of pioneer African leaders just like it was previously treated by the colonial government. This struggle for fauna by the post-colonial elite was observed from the aftermath of the 8th Commonwealth Conference on forestry that was held in the year 1962 which emphasized on state controlled exotic softwood establishment because of its greater economic and technical viability than regenerating indigenous forests, (KNA/4/4/). From the Commonwealth Conference Report of 1962, it was evident that the colonial government, through the shamba system and administrative forestry reforms, had already

redrawn the social and economic life of Koderia forest community that was now dependent on exotic trees for timber than indigenous ones.

Cognizant of the fact that the welfare of Koderia people was linked closely with the management of the forest, post- independence governments failed to take this into consideration in spite of Beinart's (2000) rejoinder that although scientific principles in forest management have been subjected to critical scrutiny because of the perception that they might have outlived the colonial epoch, they have interestingly remained central in the development strategies of the independent states. This assertion by Beinart is refuted by Maathai (2009) who blamed the successive application of the shamba system as a recipe for forest destruction and encroachment. Findings from this study therefore debunked the narrative that the shamba system of forest management was to blame for exacerbating forest encroachment by analyzing the effects of this policy both in the colonial and post- colonial dispensations. Its success in the colonial period was already witnessed whereby it improved afforestation in Koderia forest besides providing avenues for settler income generation. Failure of the policy in the post – independence era especially during the environmental forestry era of 1980 and beyond was the bone of contention in this study.

Reidar (2003) observed that industrial forestry era was witnessed between the years 1960-1970 which was consequently characterized by emphasis being put on forestry as the engine for economic take-off in developing countries. In spite of positive success in the initial phases whereby British American Tobacco company made significant contribution to the re- forestation program in Wire, Lambwe and Koderia forests by giving farmers tobacco seedlings to be planted alongside tree seedlings (KNA/NBI/F6/2/).

Reidar (2003) further observes that considerable felling of timber was witnessed without commensurate planting during the industrial forestry era which consequently ushered in environmental forestry era in the period 1980-1990. Environmental forestry was characterized by large scale clearing and burning of virgin land. This threatened the survival of both indigenous people and caused severe degradation of the local environment besides, clearing and degradation of the environment, Environmental forestry was witnessed in the tendency towards nature conservation, the need to defend biodiversity gained strong support and the hypothesis regarding global warming became widely accepted.

Effects of environmental forestry era included the formulation of the National Food Policy of 1981 which led to encroachment in forests, (G.O.K, Sessional Paper No1 1981). Klopp (2012) confirms that the environmental forestry era further witnessed the launching of DFRD in the year 1983. The plan professed to immensely transfer power and decision making to the district level. The responsibility of implementing shamba system was transferred to these committees as part of decentralization. Forests were even closely entwined into patronage networks involving local politicians and the then provincial administration. Two informants & Ombogo in 2018 noted that the provincial administration took advantage of this space to solicit funds from the people in order to be allocated plots. Besides, pressure from political leaders on forest staff has also been common in Koderera forest, it was noted that the political leadership in Kasipul have more than once engaged their cronies in the shamba system practices and activities. Most often, such farmers did not follow the rules and regulations associated with the policy. They could as well transport people who could pay bribes from other districts who were allocated plots. The shamba system was commercialized with the administrators looking at it as an alternative source of income for personal gain while forest officers either colluded or speculated from the sidelines.

Furthermore, the plots in most cases were sold to prospective cultivators, which, by and large, contributed to the abuse of the system. Cultivators resulted in tampering with the trees in an effort to stay longer in a plot to recoup the money given to the sellers. An FGD session held at Awach in 2018 revealed that residents believe that neglect in follow up in policies like the National Food Policy of 1981 resulted in the abolition of the shamba system policy due to the forest destruction it caused.

Further observations by Reidar (2003) and Fastone (2016) revealed that the tendency towards nature conservation focusing on forests rather than people gained more prominence at the beginning of the year 1990. The scholars above assert that the need to defend biodiversity gained strong support and environmental activists and organizations such as the Green Belt movement rose to defend biodiversity. Klopp (2012) politically concurs with Reidar (2003) and Fastone (2016) that, as from the year 1990 when the state was contested by the emergence of opposition parties, deforestation accelerated visibly and dramatically. She notes that many state sanctioned forests in this period can be traced to patronage politics of the key actors in KANU, the dominant political party that was struggling to hold on to power. During the year 1990, Koderia forest faced destruction. KII data from a forest expert Mica in 2018 explained that forest laws that exacerbated encroachments were in place which negatively affected the performance of shamba system. The argument espoused here is that politically motivated policies that affected the shamba system were passed in parliament. As much as environmental activists rose to defend biodiversity, the question therefore begs, was the shamba system the cause of deforestation or the political class through policy formulation that exacerbated deforestation? In-depth interviews with Jacktone & Maren in 2018 further confirmed that, when protests and movements involving the media, civil society and parliamentarians emerged, forests became a key locus of

struggle over unaccountable state power. Provincial administration used this opportunity to dish forest plots to people and tree harvesting was also carried out without planting others.

Studies in forest politics by Otieno (2008) in Kisian and Maragoli in the years 1940-1990 confirms our position that forest destruction was rife in the post- independent period where the provincial administration led by D.C Dave Mwangi carried out logging without planting leading to loss of the entire forest landscape hence depriving the locals of their livelihoods . Attack on forests was part of a more general irregular appropriation of land and many editorials of 1990 showed that the situation seemed to be getting uglier day by day (Twaddle, 1992). Anderson (2002) posits that, in 1990, the basic structure of forestry in Kenya retained much of the colonial form. The Colonial administration had converted large tracts of Kenyan forests to government land and subsequently established the position of the chief conservator of forests to oversee the management of forests. He notes that forests that were originally managed by local communities became the locus of struggle between the colonial government attempting to mediate access to local people who did not recognize the authority of the colonial states and other external actors eager to gain logging concession. An FGD session at Awach in 2018 confirmed that various parts of the forest were excised. For instance, a plot was excised for the establishment of Lake Basin Development Authority at Awach and another plot for brick making at the same Awach and Magungu. These excisions were done without consulting the forest officials and residents. Consequently, concerns were raised about irregular exploitation of forests. From observations made in the field, apart from corruption, irregular excision of Kodera forest has exacerbated forest loss.

Moreover, it is in the post-colonial period that saw Kenya's forest cover had fallen from 30% in the year 1963 to 3% in 1990 with the central government continuing to legally control the forest

boundaries (Anderson ,2002). In the year 1990, the forest department came under the Ministry of Environment and Natural Resources. The Forest Act of 1964 that was still operational was immensely abused. The Act gave the minister powers to alter boundaries and also the power to survey the excision area and draw up a boundary plan. With the minister of environment, a political appointee of the president now with all these powers in theory, in practice, what it meant was that the president and his associates had the powers to alter legal boundaries of forests and as a continuation with the colonial management, they often did excisions without informing the relevant forest officials hence forests became helpless and susceptible to theft of trees and blame of the shamba system arose already. However, a forest official called Peter in 2018 asserted that the shamba system was still the best in tree establishment. He had this to say on the contest between environmental activists and the forest department with regard to the shamba system and forest loss:

'it is the government and politicians malpractices such as briefcase logging, forest excision and dishing forest lands for political purposes that gave way to national forest conservation lobby groups such as Greenbelt Movement led by Wangari Maathai to question forest management. They merely criticized shamba system which made them gain support from international watch dogs, like UNEP and World Bank. Later after assessment of the problems the policy faced, it was introduced once again.

In one of her speeches, Maathai (2009) critiqued forest management in Kenya and pointed out political infiltration in forest management by stating that:

"It will only take the next political leadership ready and willing to use forests as they have been used in the past, to dish out forests and settle their friends In the name of shamba system to Supporters and tribesmen. Nobody will be able keep away Charcoal burners, and poachers of trees."

Sentiments by the forest official Peter in 2018 on the narrative that the shamba system was still the best in tree establishment was more justifiable due to the fact that even after the hue and cries that led to its abolition in the year 2004 due to pressure from the civil society, assessment of the policy was done and the Forest Act of 2005 recommended that the policy be used in forest establishment. Furthermore, studies by Achungo (2015) and Mwatika (2013) acknowledged that the shamba system was still the best approach to forest establishment because it is cheap and is in line with Vision 2030 that highlights sustainable development in forests as its core mandate.

Apart from the tussle between environmental activists and the forest department, other commentators have a narrative that political infiltration in the forest department has affected the shamba system since independence. Shazia (2014) and Klopp (2012) assert that it has been observed in many aspects that politicians wield control over rent-seeking opportunities that are exchanged for political support through patron-client networks because government resources have constituted an argument for increased political economy that underlies natural resource policies. In the case of Mau forest, Shazia (2014) specifically notes that Mau forest surfaced as an issue of global political discourse in the year 2009 during the Copenhagen World Summit on climate change where it caught the attention of the international community. With regard to this, a task force was formed under the office of the Prime Minister which revealed that the forest was under severe threat and consequently recommended the eviction of illegal squatters. This was met by political antagonism from the Rift-Valley politicians.

Observations by Klopp (2012) and Shazia (2014) concurs with an informant Maria in 2018 who revealed that, in spite of the Luo Nyanza remaining in opposition politics in Kenya, Koderia forest as a government resource was dished out for political reasons. Politics therefore determined the management of the shamba system in Koderia forest. This was occasioned by

political rhetoric and promises that were made to the voters in subsequent elections as from the year 1988 up to 2002 by the ruling party candidates led by Omanya Adongo in a bid to shun opposition politics. In-depth interviews with Omollo Ochoire in 2018 revealed that various plots were thus allocated politically to people for political millage. An FDG session held at Awach in 2018 moreover, confirmed that the narrative during electoral campaigns was that if you vote the government of the day, you would in turn benefit from the forest. Forest plundering however, continued unabated irrespective of the voting pattern. It was inferred from a series of interviews that the core mission of the shamba system that was to conserve Kodera forest was cast aside due to political infiltration in that, because a majority of farmers had a backing from politicians they engaged in massive tree theft and farming thereby relegating tree planting.

Consequently, abuse of the shamba system in most Kenyan forests led to its proscription in the year 2004 (Fastone, 2016). This was followed by a review of the shamba system success and failures which formed the Forest Act 2005. This Act further recommended the shamba system in forest establishment (GOK, Forest Act, 2005). This formed a contentious issue between government and activists because the latter believed that the shamba system is to blame for deforestation and the former held the position that the system is suited for conservation of forests.

Retrospectively, GoK (2005) informed the government's decision in the year 2007 under Hon. David Mwiraria the Minister for Environment to make a ministerial statement that amounted to the re-introduction of the shamba system for the third time in Kenyan forests. This re-ignited a long -simmering controversy as to whether the system was good or bad. The first protagonist of this debate was the late professor Wangari Maathai who championed the abolition of the *shamba* system as this debate ensued (Mathai, 2009). On the other hand, a well-known scholar called Dr.

John Kaboggozza of the Faculty of Forestry and Nature Conservation of Makerere University using Uganda's experiences from shamba system was astounded when he heard that Kenya had stopped the *shamba* system. He questioned: "*How will you establish forest plantations without the shamba system? The forest adjacent communities will dislike forest intensely and even they burn them down*" (Muchangi, 2011). A KII informant called Peter in 2018 revealed that from Koderia forest shamba system experiences, it emerged that the shamba system succeeded well up to the year 1980 when major forms of abuses were witnessed. It was further revealed that, despite the fact that the shamba system was on course, deforestation continued and this was due to corruption whereby those farmers who had access to forest plots at a fee saw no logic in establishing plantations thus they deliberately killed tree seedlings to enable them stay longer in the plots. Proscription of the policy in the year 2004 similarly witnessed forest destruction through tree theft and forest fires.

In spite of the failures of the shamba system in Koderia forest in the post-colonial era, studies in forest history by Anderson (2002), Otieno (2008) and Fastone (2016) holds that, the success of the shamba system in India merited the imperial purse in Kenya. Anderson (2002) in particular notes that shamba system had a long and turbulent post-colonial history with its stable operation during the colonial period being looked upon. The simmering debates that ensued after the government's decision especially from the activists was by large occasioned by the problems that affected the policy which led to its ban but that did not imply that the policy was not appropriate. This was confirmed by a key informant Peter in 2018 and studies by Achungo (2015) that gave the greenlight of the policy in forest management only when modalities are followed to the letter.

Even when modalities of the shamba system were to be followed, concern by Lemarkoko (2011) over lack of political will and incitement is also a factor to be considered in the management of forests in Kenya. From experiences in the Mau, the scholar posits that management of natural resource based conflict in the Mau between the years 1963-2010 has been hindered by political incitement urging locals to abandon government projects especially the task force on conservation that was spearheaded by the then Prime Minister Raila Odinga. The task force recommended, among other things, stopping of deforestation by availing of enough funds to the Kenya Forest Service to enable them carry out their operations effectively, eviction of illegal squatters and demarcation of the forest to avoid further encroachment. Several political opposition paralyzed the operation of this task-force. In Koderia forest, evidence revealed that negative political utterances in forest management have endangered the management of the forest resources through negatively influencing the local people to disown the forest as their resource and also in the participating in various sub committees that allocate forest lands. In May 2016, it was reported that hundreds of residents staged a demonstration in Oyugis town over the destruction of Koderia and Wire forests. The Orange Democratic Movement Constituency chairman Mr. Evance Ndege led this demonstration. They appealed to the government to stop destruction. The party chairman said:

*“Koderia and Wire forest should be banks of trees but this has not been the case due to deforestation that has changed some parts of Kasipul into a semi-arid area. We shall speak the language that the government understand if our people will continue to suffer”
(Oywa, 2016)*

The Standard Newspaper (2011) established that scientists had warned that massive depletion of the few remaining gazetted natural forests in Nyanza would have serious ramifications on the region's ecology. They say that unchecked human activity — from charcoal burning to illegal

logging —could subvert the complex ecology that thrives on the balanced rhythm of nature. This statement placed Koder forest at the center of attention during a world environmental day. Former Prime Minister Raila Odinga led a team of environmentalists and the local Koder residents in planting of trees. Prime Minister Raila Odinga said that:

“I am worried about the future of Koder forest which provides livelihoods for more than 120,000 households. The destruction of Koder forest in this region threatens fishing in Lake Victoria since some trees species used in the building of boats are only found in Koder forest are now on the brink of decimation. The government intends to initiate a community –driven programme to rehabilitate Koder forest that is facing extinction”. (Otieno, Standard, 2011)

From the Prime Minister’s speech, one major recommendation for Koder forest was a community-driven program that could salvage the forest from plunder. This is the shamba system that has also been advanced through the Forest Act 2005 and studies by Achungo (2015) and Mwatika (2013). For its successful application, however, policies and regulations must be adhered to. It is evident that, in the better part of the post-colonial period, there were attempts to subordination the law in conservation like the National Food Policy of 1981 and 1986.

6.7 Conclusion

This chapter has accounted for the effects of the shamba system in Koder forest. It established that the shamba system was successful in colonial forest management. However, in the post-colonial administration, the policy was faced by a myriad of challenges. It was therefore inferred that most forest policies that were formulated were intentionally tailored to open up avenues for corruption and mismanagement of forests to satisfy the egos of the ruling class. From this form of exploitation and mismanagement, the study concluded that forestry in Kenya represented an avenue of state power. Politicians and bureaucrats, through various legislations, relegated the

locals as gate keepers to forest establishment consequently opening the forest to abuses and corruption. While the environmental activists were justified in their quest for efficient forest management following a surge in deforestation, their attack on the shamba system proved to be unjustified. It was therefore inferred that the civil society were dissenting voices that ought to have been involved in the operations of the shamba system to attain the core mission of participatory aspect of the shamba system.

CHAPTER SEVEN

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction

This study set out to analyze Shamba system of forest management and economic change in Koderu, Homabay County, 1957-2012. We sought to investigate the factors behind the adoption and persistence in the application of the policy in spite of the challenges that it faced particularly in the post-colonial dispensations. We also investigated the economic changes that resulted following the application of the shamba system in Koderu forest and finally the effect of the shamba system on Koderu forest management. This chapter summarizes the major findings and makes recommendations on policy formulation and implementation on forests.

7.2 Summary

The findings of the study are summarized as follows: At the time of application of the shamba system in Koderu forest, there existed traditional forest management practices. Those practices that delved into tree conservation would be aligned with the British agenda on conservation. For instance, taboos against cutting certain trees were adopted. The subsequent introduction of exotic tree species would, however, see the shedding off of these traditional practices because exotic trees were favored when compared with traditional trees because they fetched higher market values. Nevertheless, it was found that timber trade, financial scarcity and the need to generate revenue called for the adoption and application of the shamba system in Koderu forest. Unlike in most historical forest studies, this study revealed that disease and epidemic (Nguku epidemic) led to the adoption of shamba system in Koderu forest. It was also found that the shamba system triggered economic changes in that new tree species were introduced. They were considered to mature faster and they had higher market value compared with indigenous trees. This study revealed that exotic tree species were preferred to indigenous species due to

‘Plant Transfers’ phenomenon from the Metropole to the Center which characterized Green imperialism. Consequently, new technology in forest and tree establishment such as rotation of plantations and crops, tending trees in nurseries replaced the traditional self-regeneration of trees. This alien technology in forest management led to massive tree production hence excess seedling were sold in various markets. On the other hand, the shamba system led to migrant labour and rise in wage labour. However, in contrast to studies in economic change in Africa which posit that migrant labour led to changes in social roles whereby women remained at home to take up their husband’s duties, this study revealed that, in the shamba system there were no changes in social roles and gender roles as both men and women took part in the shamba system either as an employee of the forest department or as a farmer.

These were exacerbated by changes in forest policy in the British dominions as from the year 1957 following the Scientific ascendancy to forest management era which laid more emphasis on forests as social and economic avenues through creation of employment opportunities. Salaries and wages were used by those who were employed for paying school fees and acquiring valuables besides putting up modern houses. Moreover, the shamba system transformed forest and land ownership from public to private tenure system which was observed to have been a major cause of corruption during the environmental forestry era of 1980-1990.

Finally, the study found that the shamba system had a positive effect in colonial era while in the post- independence era (environmental forestry era) the policy failed in the conservation of Koderu forest. Notable colonial successes included: setting up of forest boundaries, firefighting and settling people who had nowhere to go during the pacification and occupation of Koderu forest. However, in the post- colonial period, this study revealed that forest policies were put in place that exacerbated forest encroachment and deforestation. Whereas this study acknowledged

the role of environmental activists in defence of forest protection during the environmental forestry era and beyond, their attack on the shamba system as a policy that exacerbated deforestation was found to be a false narrative. This study found that, indeed, the shamba system is still the best approach to forest management and tree establishment when compared to planting trees without food crops if only reliable forest laws are made and implemented.

7.3 Conclusions from the study

The study concluded that the adoption of the shamba system in Koderera forest was faced by two major sets of narratives: First, that during the advent of colonialism there were no forests and African forests provided breeding grounds for *Nguku* insects hence there arose a need to adopt colonial forestry models. Revelations from the findings from this study led to the conclusion that the aforementioned factors for the adoption of the shamba system were narratives that were geared towards sweeping away African knowledge in forest management replacing it with the colonial modes of forestry production.

Secondly, the study concluded that both scientific ascendancy to forestry era, 1945-1963 and Industrial forestry era, 1963-1980 led to the establishment of forests through the shamba system with significant economic changes being noticed. The most significant one happened during the industrial forestry era whereby forest policy evolved from defence reasons to emphasis on social and economic reasons through diversification of employment in forests. This led to the rise of migrant labour in Koderera forest. It was concluded that the rise in migrant labour in Koderera forest was not gender biased in contrast to studies on economic change that saw women being relegated as home managers while their husbands went to seek jobs in towns for two reasons: The proximity of the forest to the people made it convenient for all people irrespective of gender to look for jobs. Second, there was a wide array of employment in the forest department, both men

and women could be either self –employed as farmers or they could be employed by the forest department as full time forest workers earning wages. The introduction of new technology and plant transfers from the Metropole to Africa led to massive timber production hence intensifying timber trade. It was concluded that emphasis on exotic breeds and plant transfers campaign that were waged by the colonial administration was a wider imperial scheme that was geared towards colonizing Africa, its people and resources including trees.

Thirdly, the study concluded that, shamba system was effectively used in management of Koderia forest in the colonial period. However, in the post-independence epoch, policy and legislative framework ushered in an era of forest exploitation during the environmental forestry era . From this form of forest exploitation, this study concluded that forestry represented an avenue of state power. Politicians and bureaucrats, through various legislations, relegated the locals as gate keepers to forest and tree use thereby opening the forest to abuse and corruption. While the environmental activists were justified in their quest for efficient forest management following a surge in deforestation, their attack on the shamba system proved to be unjustified. It was concluded that they were dissenting voices that ought to have been involved in the operations of the shamba system to attain the core mission of participatory aspect of the shamba system.

7.4 Recommendations of the study

A lot of secondary data notably: Crosby (1986) Mayr (1965) relegate pre-capitalist Africans from forest management. Since findings from this study reveal that Africans were actively involved in forest management, from the first objective of study, it is recommended that traditional African forest management mechanisms be preserved in the archives for future generations and for further research.

Secondly, it was established from archival data such as Troup Commission on forestry in Kenya and secondary materials such as Cosby (1986) and Beinart (2003) that plant transfers characterized colonial green revolution. This consequently led to the rise in appetite for European tree species while demystifying African species as inferior in the market in terms of cash value. Preference of European species meant that African species were regarded as less useful. This study recommends from the second objective that botanical research be carried out to identify medicinal trees and plant them in designated plots in Koderia and other forests in the republic.

Finally, on the effect of the shamba system on forest management which was the third objective of study, it was revealed from oral sources, secondary materials such as Klopp (2012) and Lemarkoko (2014) and selected speeches such as Wangari (2009) that forest management in the post- independence era witnessed an intense debate over the shamba system. It was however, established, that the civil society were dissenting voices that were left behind in forest management which consequently led to the failure of the policy in Koderia forest in the post-independence era. With regard to this, the study recommends that participation of all stakeholders in forest management needs to be enhanced as envisaged in the core mission of the shamba system. Besides that, close supervision of the forest department need to be enhanced to stamp out corruption as witnessed in the post-independence period. Finally, environmental sensitization should be done constantly to ensure that forest communities from Koderia forest are not incited by politicians when new management practices are introduced.

7.5 Suggestions for further research

According to Carruthers (2004), the field of environmental history emerged in the 1960s with the aim of contextualizing and historicizing environmental issues. However, it also held the premise

for catalyzing action towards human improvement and justice for connecting with growing ideas around sustainability and environmental equity. Because it still has less public and academic purchase, the current study endeavored to continue this debate by conducting a study on a history of the shamba system of forest management and economic change in Koderia forest (1957-2012). Other areas that are suggested for further research include: Comparative study of traditional and modern forest management practices. This is owing to revelations that were made in chapter four that Africans in Koderia forest had strategies in forest management way back before imperialism. Besides that, the study also suggests, “Re-thinking ‘Green Imperialism’ in the quest for forest management in Kenya”. This follows revelations by Beinart (2000) that colonialism was premised upon transforming African culture, resources such as forestry and technology. Anderson (2000) also acknowledges that in 1990, the basic structure of forestry in Kenya retained much of the colonial form. What now requires further examination is the extent to which facets of imperialism are still prominent in forest management in Kenya? Lastly the study suggests an assessment on the role of the ‘dissenting voices’ in the mismanagement of forests in Kenya. As observed from Klopp (2012) and Shazia (2014), dissenting voices includes, politicians, civil society and community. Revelations from this study confirmed that politicians have used forests in Kenya as opportunities for seeking political support. Further research need to be done on their role in mismanaging forests.

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APPENDICES

APPENDIX1: LIST OF ORAL INFORMANTS

NAME	AGE(yrs.)	GENDER(M/F)	PLACE OF INTERVIEW	DATE OF INTERVIEW
1.Ong'ou Gomba	91	M	Ombek	1/1/18
2.Omollo Mboga	43	M	Ombek	25/1/18
3.Eric Odede	68	M	Kamiyawa	25/1/18
4Odhiambo Achola	50	M	Kamiyawa	2/1/18
5.Omollo Ochore	62	M	Katanga	25/2/18
6.Joel Mboga	58	M	Mititi	26/2/18
7.Lucia Ogogo	80	M	Awach	3/3/19
8.Magak Abok	76	M	Kamiyawa	3/3/19
9 Odhiambo john	62	M	Awach	5/3/18
10.Nicholas Odero	44	M	Awach	5/3/18
11Mary mbowo	83	F	"	5/3/18
12Johana Okuma	86	M	"	5/3/18
13JudithAtieno	50	F	"	5/3/18
14Seline Olum	65	F	"	5/3/18
15John Ananga	72	M	"	5/3/18
16Rose Okong'o	82	F	"	5/3/18
17Atanga Gumbe	68	M	"	5/3/18
18OmbogoNdong'a	91	M	"	5/3/18
19Anjilina Juma	87	F	"	5/3/18
20. Lucy Owino	61	F	"	4/4/18
21Maria Opudo	73	F	Lidha Kamiyawa	6/4/18
22BrendaAkumu	64	F	"	6/4/18
23Ondu samwel	73	M	"	"
24Jane Awino	77	F	"	"
25Syprose Odongo	65	F	"	"
26Melchizedek O	37	M	"	"
27Isaac Otieno	39	M	"	"
28Joseph Okul	52	M	"	"
29Mika Osimbo	54	M	"	"
30 Marren Oduogo	56	F	"	"
31.Blasto Oduogo	60	M	"	11/8/18
32Phoebe Achieng	45	F	Nyawende Mititi	"
33Lencer Achieng	52	F	"	"
34Winfred Aluoch	72	F	"	"
35Jackton Odhiambo	80	M	"	"
36William Ajwang	37	M	"	"
37Aketch Omoro	88	M	"	"

38Juma Amollo	74	M	“	“
39Christopher Ojwang	62	M	“	“
40 Jane Akoth	63	F	“	14/8/18
41 Ondeyo Jamoko	81	M	“	‘14/8/18
42Ajwang’ Genga	86	F	Dol-Kodera	16/8/18
43Jack Odhiambo	61	M	Dol-Kodera	16/8/18
44 Daniel Okombo	82	M	Nyakiya	14/12/18
45 Ruth Asembo	88	F	“	“
46Mollly Achieng	42	F	“	“
47Wilson Omoro	90	M	“	“
48Gumbe Girison	92	M	“	“
49Aketch Chieng	95	M	“	“
50Achieng’ Nyamwala	84	F	“	“
51Orinda Omenda	69	M	“	“
52Odembo Ondiek	86	M	“	“
53Harison Adika	60	M	“	“
54Kefa Odhiambo	64	M	“	“
55.Otieno Oyieko	45	M	Ombek	16/12/19
56Akumu Owino	83	M	Nyakiya	3/2/19
57 Ananga wuon Ougo	94	M	Mititi	3/2/19
58. Mike Naman	41	M	Nyakiya	5/2/19
59 John Achola	57	M	Mititi	5/2/19
60 Peter Moseti	58	M	Awach	25/2/18

APPENDIX 2 ARCHIVAL SOURCES

1. KNA/NBI/F1/11/Rachuonyo District Development Plans 1997-2001
2. KNA/NBI/F1/3/2/D.C/Homabay/District Development Plans 1994-1996
3. KNA/NBI/F6/1/South Nyanza/District Development Plans 1989-1993
4. KNA/NBI/ F6/2/South Nyanza/District Development Plans 1979-1983
5. KNA/NBI/F6/2/South Nyanza/ District Development Plans 1984-1988
6. KNA/NBI/ F8/Forest Department. Annual report of forest department 1957
7. KNA/NBI/F8/3/Forest Department. Annual report of forest department 1958
8. KNA/NBI/F8/3Forest Department. Annual report of forest department 1959
9. KNA/NBI/F8/3Forest Department. Annual report of forest department 1960
10. KNA/NBI/F8/3Forest Department. Annual report of forest department 1961
11. KNA/D.C /KSI/1/21South Nyanza Annual report 1959
12. KNA/D.C/KSI/1/12South Nyanza annual report on forest conservation 1959
13. KNA/PC /2/3/Nyanza, Forestry and afforestation programmes 1951-1957
14. KNA/NBI/1/48 Plan of work for the upland forest districts 1959
15. KNA/NBI/3/1 Forest department Orders and circulars 1958-1963
16. KNA/PC/NZY / 3/11/14 timber concessions and timber trade 1951-1963
17. KNA/RV.F8/3/ Forest publications and articles for the press 1954-1957

18. KNA/SZY/1/3/South Nyanza District Annual reports: Labour registered to work inside and outside South Nyanza 1951- 1962
19. KNA/NBI/2/11/Safari diary kept by D.C South Nyanza 1959
20. KNA/NBI/D.C/KSI/3/11Political record book Kisii 1959
21. KNA/NBI/3/11Gardner's letter to DC South Nyanza 1960
22. .KNA/NBI/1/2/District Agriculture office, Kosele, 1996
23. KNA/NBI/115/37/54/ a letter from conservator to foresters/The future of the timber industry in Kenya 1957
24. KNA/NBI/1/2/Forest department ,Annual reports 1960
25. KNA/NBI/F1/Forest department ,Annual report 1962
26. KNA/NBI/F1/Forest department, Annual report 1963
27. KNA/NBI/F1/Forest department ,Annual report 1965
28. KNA/NBI/F1/Forest department ,Annual report 1970
29. KNA/NBI/F1/Forest department ,Annual report 1975
30. KNA/NBI/1/2/ District Agriculture office, Kosele, 1996
31. KNA/NBI/1/3District Planning Unit, Kosele,1996
32. KNA/NBI/1/2/Forestry Department Homabay,1996
33. KNA/NBI/ V/1/Troupe Commission1921
34. KNA/NBI/DC/SNYZ/1/5/2/Minutes of the LNC: request to graze cattle in the forest as quoted by D.C South Nyanza 1958
35. KNA/NBI/1/5/Letter from Forester Young to Director of Education 17/Dec/ 1959.
36. KNA/NBI/4/4/8TH Commonwealth Forest Conference Report no 10 1962.

APPENDIX 3 : KEY INFORMANT INTERVIEW GUIDE

Questionnaire on: Shamba system of forest management and Economic change in Koder, Homabay County, 1957-2012. My name is _____ I am carrying out a research for my master of arts in history at Maseno University on Shamba system of forest management and Economic change in Koder, Homabay County, 1957-2012 .Should you answer my questions diligently and truthfully then i promise to maintain confidentiality with this information, feel free to ask any question owing to the fact that you will be treated as anonymous respondent.

CONSENT FORM /LETTER FOR KEY INFORMANT INTERVIEW GUIDE

Title of the study: Shamba system of forest management and Economic change in Koder, Homabay County, 1957-2012.

Pricipal investigator.....Odieny Arthur Oyugi PG/MA/007/12...Maseno University

Co- investigators.....Dr. Jacob Adipo OgalloMasen University

Prof Raphael J.A Kapiyo.....Maseno University

Study location.....Koder forest in Homabay County - Kenya

Puopese of study.....To investigate the persistence in the application of shamba system in Koder forest amidst forest destruction.

Dear respondent,

I am a student at Maseno University pursuing a degree course in master of arts in history. As part of my course work , I am carrying out a research on **Shamba system of forest management and Economic change in Koder, Homabay County, 1957-2012**. The information collected is purely for academic purpose and shall be treated with utmost confidentiality and your responses shall remain anonymous and shall be published only with your consent. Data from this research will be kept under lock and key and reported only as collective combined total. If you agree to answer the questions in the questionnaire please answer them as best as you can.

Signature of the interviewee

Thank you in advance

Yours faithfully,

Odieny Arthur Oyugi

PG/MA/007/12

For questions pertaining to right as a research participant, contact person is:
Secretary, Maseno University Ethics and Review Committee
PRIVATE BAG ,MASENO
Telephone 057-51622/0722203411/0721543976/0733230878
Email: muerc-secretariat@ maseno.ac.ke
Muerc secretariate@gmail.com

1. How was Koder forest managed before the application of the shamba system?
2. In what ways has the shamba system helped in the management of the forest?
3. In your own understanding, what were the economic changes that were attributed to the application of shamba system in Koder forest?
4. Plots in the forest were allocated on what basis?
5. How did the residents react to the abolition process?
6. What are some of the negative effects of the abolition of the Non- resident cultivation on the residents and on the forest in general?
7. What are the causes of tree loss in Koder forest?
8. Which measures have been put in place to conduct afforestation programmes and has the residents been included?
9. What are some of the effects of the shamba system on the management of Koder forest?
10. How has forest policies influence management of shamba system in Koder forest?

APPENDIX 4: FOCUS GROUP DISCUSSION GUIDE.

1. Based on your knowledge and experience, what is the origin of Koder forest?
2. Based on your knowledge and experience how did the people of koder forest organize themselves economically before the introduction of shamba system in Koder forest?
3. Based on your knowledge and experience, what were the changes in forest management in Koder forest during the following periods:
 - Pre- colonial period
 - Colonial period
 - Post-colonial period
4. Based on your knowledge and experience, how did the introduction of Shamba system in Koder forest influence economic change based on:
 - Introduction of new breeds of crops by the Europeans
 - Introduction of new breeds of animals
 - Introduction of new methods of farming
 - Change in land tenure system.
5. Based on your knowledge and experience, how did the following factors Influence the application of shamba system in Koder forest:
 - Demand for timber during timber trade.
 - Springs of famine
 - Need for afforestation
 - Climate change
 - Employment
6. Based on your knowledge and experience how did the shamba system solve the following issues:

- Land tenure system
- Pasture
- Provision of livelihood
- Afforestation programmes
- Human animal conflict.

7. Based on your knowledge and experience, what was the impact of shamba system on the following:

- Employment of forest officers
- Management/ conservation of forest
- Addressing illegal logging.
- Food security

8. Based on your knowledge and experience how has forest policies influence management of shamba system:

- In the colonial period
- Post-colonial period

CONSENT FORM /LETTER FOR FOCUS GROUP DISCUSSION GUIDE

Title of the study: Shamba system of forest management and Economic change in Koder, Homabay County, 1957-2012.

Principal investigator.....Odieny Arthur Oyugi PG/MA/007/12.....Maseno University

Co- investigators.....Dr. Jack OgalloMaseno University
Prof. Raphael J Kapiyo.....Maseno University

Study location.....Koder forest in Homabay County in Kenya

Puopese of study.....To investigate the persistence in the application of shamba system in Koder forest amidst forest destruction.

Dear respondent,

I am a student at Maseno University pursuing a degree course in master of arts in history. As part of my course work, I am carrying out a research on **Shamba system of forest management and Economic change in Koder, Homabay County, 1957-2012**. The information collected is purely for academic purpose and shall be treated with utmost confidentiality and your responses shall remain anonymous and shall be published only with your consent. Data from this research will be kept under lock and key and reported only as collective combined total. If you agree to answer the questions in the questionnaire please answer them as best as you can.

Signature of the interviewee

Thank you in advance

Yours faithfully,

Odieny Arthur Oyugi

PG/MA/007/12

For questions pertaining to right as a research participant, contact person is:

Secretary, Maseno University Ethics and Review Committee

PRIVATE BAG, MASENO

Telephone 057-51622/0722203411/0721543976/0733230878

Email: muerc-secretariat@ maseno.ac.ke

Muerc secretariate@gmail.com

APPENDIX 5: IN DEPTH- INTERVIEW GUIDE

1. .How was Koder forest managed before the onset of colonial administration?
2. What were some of the changes that resulted after the acquisition of Koder forest by the colonial administration?
3. How did the changes that resulted from colonial management affect the residents?
4. What were some of the economic activities of the residents' before colonialism?
5. In what ways did colonial forest management through the application of the shamba system affect the economic activities of the residents?
6. What has constantly informed the application of the shamba system in Koder forest in spite of the abolition process that have been witnessed over time?
7. What are the effects of the application of shamba system on the management of Koder forest?
8. What are some of the challenges that have affected shamba system in Koder forest with respect to forest laws that were formulated?

CONSENT FORM /LETTER FOR IN DEPTH- INTERVIEW GUIDE

Title of the study: Shamba system of forest management and Economic change in Koderia, Homabay County, 1957-2012.

Principal investigator.....Odieny Arthur Oyugi PG/MA/007/12...Maseno University

Co- investigators.....Dr. Jack OgalloMaseno University

Prof Raphael J. Kapiyo.....Maseno University

Study location.....Koderia forest in Homabay County- Kenya

Puopese of study.....To investigate the persistence in the application of shamba system in Koderia forest amidst forest destruction.

Dear respondent,

I am a student at Maseno University pursuing a degree course in master of arts in history. As part of my course work , I am carrying out a research on **Shamba system of forest management and Economic change in Koderia, Homabay County, 1957-2012**. The information collected is purely for academic purpose and shall be treated with utmost confidentiality and your responses shall remain anonymous and shall be published only with your consent. Data from this research will be kept under lock and key and reported only as collective combined total. If you agree to answer the questions in the questionnaire please answer them as best as you can.

Signature of the interviewee

Thank you in advance

Yours faithfully,

Odieny Arthur Oyugi

PG/MA/007/12

For questions pertaining to right as a research participant, contact person is:

Secretary, Maseno University Ethics and Review Committee

PRIVATE BAG ,MASENO

Telephone 057-51622/0722203411/0721543976/0733230878

Email: muerc-secretariat@ maseno.ac.ke

Muerc secretariate@gmail.com

TRANSLATED VERSION IN DHOLUO LANGUAGE

Title of the study: Shamba system of forest management and Economic change in Kodera, Homabay County, 1957-2012.

Principal investigator.....Odiény Arthur Oyugi PG/MA/007/12...Maseno University

Co- investigators.....Dr Jack OgalloMaseno University

Prof Raphael J. Kapiyo.....Maseno University

Study location.....Kodera forest in Homabay County in Kenya

Puopese of study..... To investigate the persistence in the application of shamba system in Kodera forest amidst forest destruction.

Ne jalony,

An japuonre e mbalariany mar Maseno. Atimo nonro e weche mag pur e i bungu mar Kodera. Atemo fuono kabe pur e i bungu mar kodera osekonyo kungo bungu kuom kethruok. Nonro matimoni en mana mar somo kende ok en mar piny owacho kata mar maling' ling' mar kelo midhiero ne jopiny. Jago moyie chiwore mar chiwo maling' ling' okbiyange nyinge ayanga. Bed thuolo kiduoko penjogi. Erokamano.

Sei mar jalony/janeno

Erokamano ean
Odiény Arthur Oyugi
PG/MA/007/12

For questions pertaining to right as a research participant, contact person is:

Secretary, Maseno University Ethics and Review Committee

PRIVATE BAG ,MASENO

Telephone 057-51622/0722203411/0721543976/0733230878

Email: muerc-secretariat@ maseno.ac.ke

Muerc secretariate@gmail.com

APPENDIX 6. OFFICIAL RECEIPT FOR RESEACH PERMIT

ORIGINAL

AC: 24399

OFFICIAL RECEIPT

Station NAIROBI Date 12/02/2019

RECEIVED from ODIENT ARTHUR OYUGI

Shillings One thousand only

cents

on account of Research permit fee

Vote Head R-43

NACOSTI

Item A.1A

Cash

Cheque No. Direct Deposit

USD
Kshs 1000/-
AC
No.

Signature of Officer receiving remittance

APPENDIX 7: RESEARCH PERMIT

THIS IS TO CERTIFY THAT:
MR. ODIENY ARTHUR OYUGI
of MASENO UNIVERSITY, 4-40602
NDORI, has been permitted to conduct
research in Homabay County
on the topic: EFFECT OF THE
NON-RESIDENT CULTIVATION POLICY IN
THE HISTORY OF FOREST MANAGEMENT
IN KENYA, THE CASE OF KODERA
FOREST HOMABAY COUNTY KENYA
1957-2012
for the period ending:
4th June, 2020

Permit No. : NACOSTI/P/19/88871/28041
Date Of Issue : 4th June, 2019
Fee Received :Ksh 1000






Applicant's Signature
Director General
National Commission for Science, Technology & Innovation

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013
The Grant of Research Licenses is guided by the Science, Technology and Innovation (Research Licensing) Regulations, 2014.

CONDITIONS

1. The License is valid for the proposed research, location and specified period.
2. The License and any rights thereunder are non-transferable.
3. The Licensee shall inform the County Governor before commencement of the research.
4. Excavation, filming and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
5. The License does not give authority to transfer research materials.
6. NACOSTI may monitor and evaluate the licensed research project.
7. The Licensee shall submit one hard copy, and upload a soft copy of their final report within one year of completion of the research.
8. NACOSTI reserves the right to modify the conditions of the License including cancellation without prior notice.


REPUBLIC OF KENYA

National Commission for Science, Technology and Innovation
RESEARCH LICENSE

National Commission for Science, Technology and innovation
P.O. Box 30623 - 00100, Nairobi, Kenya
TEL: 020 400 7000, 0713 788787, 0735 404245
Email: dg@nacosti.go.ke, registry@nacosti.go.ke
Website: www.nacosti.go.ke

Serial No.A 25117
CONDITIONS: see back page

APPENDIX 8 ETHICS LETTER



MASENO UNIVERSITY ETHICS REVIEW COMMITTEE

Tel: +254 057 351 622 Ext: 3050
Fax: +254 057 351 221

Private Bag – 40105, Maseno, Kenya
Email: muerc-secretariate@maseno.ac.ke

FROM: Secretary - MUERC

DATE: 6th September, 2018

TO: Arthur Oyugi Odieny
PG/MA/007/2012
Department of History and Archaeology
School of Arts and Social Sciences,
Maseno University
P.O. Box Private Bag, Maseno

REF: MSU/DRPI/MUERC/00503/18

RE: Effect of the Non-Resident Cultivation Policy in the History of Forest Management in Kenya, the Case of Kodera Forest in Homabay County, Kenya 1957-2012. Proposal Reference Number MSU/DRPI/MUERC/00503/18.

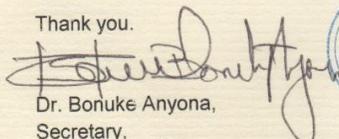
This is to inform you that the Maseno University Ethics Review Committee (MUERC) determined that the ethics issues raised at the initial review were adequately addressed in the revised proposal. Consequently, the study is granted approval for implementation effective this 6th day of September, 2018 for a period of one (1) year.

Please note that authorization to conduct this study will automatically expire on 5th September, 2019. If you plan to continue with the study beyond this date, please submit an application for continuation approval to the MUERC Secretariat by 15th August, 2019.

Approval for continuation of the study will be subject to successful submission of an annual progress report that is to reach the MUERC Secretariat by 15th August, 2019.

Please note that any unanticipated problems resulting from the conduct of this study must be reported to MUERC. You are required to submit any proposed changes to this study to MUERC for review and approval prior to initiation. Please advise MUERC when the study is completed or discontinued.

Thank you.


Dr. Bonuke Anyona,
Secretary,
Maseno University Ethics Review Committee.



Cc: Chairman,
Maseno University Ethics Review Committee.

MASENO UNIVERSITY IS ISO 9001:2008 CERTIFIED



APPENDIX 9: AUTHORIZATION LETTER FROM NACOSTI



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
2241349, 3310571, 2219420
Fax: +254-20-318245, 318249
Email: dg@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box 30623-00100
NAIROBI-KENYA

Ref. No. **NACOSTI/P/19/88871/28041**

Date: **4th June, 2019.**

Odieny Arthur Oyugi
Maseno University
Private Bag
MASENO.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "*Effect of the non-resident cultivation policy in the history of forest management in Kenya, the case of Koder forest Homa Bay County Kenya 1957-2012.*" I am pleased to inform you that you have been authorized to undertake research in **Homa Bay County** for the period ending **4th June, 2020.**

You are advised to report to **the County Commissioner, and the County Director of Education, Homa Bay County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit a **copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

**GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO**

Copy to:
The County Commissioner
Homa Bay County.

The County Director of Education
Homa Bay County.

National Commission for Science, Technology and Innovation is ISO9001:2008 Certified

APPENDIX 10: WATER PROJECT IN KODERA FOREST



The figure above is a picture of a water project in Koderia forest. The project demonstrate how forest land has been excised for other projects leading to diminishing of forest land. This is contrary to the narrative that the shamba system is to blame for tree loss.