

UNIVERSITY OF NAIROBI

INSTITUTE OF DIPLOMACY AND INTERNATIONAL STUDIES

RESEARCH PROJECT

**THE ROLE OF THE KENYA FOREST SERVICE IN THE MANAGEMENT OF LAND
DEGRADATION AND ENVIRONMENTAL CONFLICT IN THE MAU FOREST
COMPLEX**

MA PROJECT PAPER

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R52/74186/2014

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**A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN INTERNATIONAL
CONFLCT MANAGEMENT IN THE INSTITUTE OF DIPLOMACY AND
INTERNATIONAL STUDIES (IDIS) OF THE UNIVERSITY OF NAIROBI**

SEPTEMBER 2016

DECLARATION

I declare that this project proposal is my original work and has never been presented for a degree award in any other university.

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DEDICATION

I dedicate this study to my beloved wife, Teresia N. M'Ithiria.

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ABSTRACT

There is correlation on land degradation in reference to environment conflict against natural resources undocumented. Environmental conflicts mostly depend over human needs and issues such as distribution, allocation and natural resources management. History documents show how resource-based conflicts had contributed to highly destructive wars at Karamoja and Kagera regions of Uganda, Darfur in Sudan, in Rwanda genocide and even in the Niger Delta. Mau Forest Complex is Kenya's important water tower. Important rivers that deplete in to Lake Victoria, such as Rive Nile the longest one in the world originate there. Yet this important resource has come under enormous human pressure, that lead to degradation and which is pregnant with the antecedents of conflict. In early 1993 and 1994, for example, plantations and forest areas were widely destroyed after a sequence of presidential decrees that allowed evicted settlement after the elimination of the 'shamba' system in 1987. On diverse date's between 1990s and 2000, a component of the Mau Forest Complex was excised to settle forest-dwelling communities with aim of conserving the remains of the forests. The aerial recommendation over Mau Complex destruction done in support of United Nations Environmental Program, Ministry of Environment and Mineral Resources on 7th May 2008 documented the amazing level of obliteration and degradation at Mau ecosystem. Thus, environmental conflict and land degradation at Mau Complex present a clear and present threat, to Kenya's domestic political stability and achievements of its Vision of 2030 goals, even significant regional and global threats as well. Over 80% of land area in Kenya consists of arid and semi-arid lands with low population densities that depend on livestock to cater for their livelihood. 12% of Kenya's land cover has suited climate with closed canopy forest, protected either under Forest Reserves under management of Kenya Forest Service or National Parks under management of Kenya Wildlife Service or trust land forests under management of Local Authorities. The study point out the general intention of the causes and manifestations of land degradation and environmental conflict at Mau Complex, how they affect the mandate and the work of the Kenya Forest Service. The study explored how conflicts may be prevented or resolved peacefully. Primary and secondary data were both used in the study. It used purposive and snowball selective sampling and interview respondents in the known categories in both main research sites. The quantitative and qualitative collected data has been presented according to the specific objectives of the study in the research. Weak institutional policies and poor enforcement of forest laws were noted as major drivers of Kenya's forest cover change.

ACKNOWLEDGEMENT

First, I wish to thank the Almighty God for the gift of life and the grace he gave me throughout the course. I also express my sincere gratitude to my wife, Teresia N. M'Ithira, my daughters and son for their tireless support through the period of study. I also acknowledge the support of my Supervisor, Dr Shazia Chaudhry, for her guidance and encouragement throughout the course.

LIST OF ABBREVIATIONS AND ACRONYMS

ADB	African Development Bank
ADR	Alternative Dispute Resolution
ASALs	Arid and Semi-Arid Lands
CFA	Community Forest Association
COMIFORM	Community Integrated Forest Resource Management
CoK (2010)	Constitution of Kenya, 2010
DEWA	Division of Early Warning and Assessment
ECA	Economic Commission for Africa
EC	Environmental Conflict
ECR	Environmental Conflict Resolution
EIA	Environmental Impact Assessment
EKC	Environmental Kuznets Curve
EMT	Ecological Modernization Theory
FAO	Food and Agriculture Organisation
FT	Forest Transition
GDP	Gross Domestic Product
GLASOD	Global Assessment of Soil Degradation
GoK	Government of Kenya
IECs	International Environmental Conflicts
IGAD	Inter- Governmental Authority on Development
LA	Local Authority
LD	Land Degradation
LM	Land Management
LPT	Lateral presser Theory
KFS	Kenya Forest Service
KIFCON	Kenya Indigenous Forest Conservation Kenya Program
KWS	Kenya Wildlife Service
MEA	Millennium Ecosystem Assessment

MFC	Mau Forest Complex
MFCA	Mau Forest Complex Authority
MoEMR	Ministry of Environment and Natural Resource
NCCRS	National Climate Change Response Strategy
SSA	Sub Saharan Africa
TFoMFC	Task Force for the Mau Forest Complex
TEV	Total Economic Value
UN	United Nations
UNEP	United Nation Environmental Programme
UNFP	United Nations Food Programme
USAID	United States Agency International Development
WWF	Worldwide Fund for Nature

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CHAPTER ONE

INTRODUCTION OF THE STUDY

1.1 Introduction

As scholars have argued, the donations of resources in Africa's conflicts experience are almost synonymous.¹ Natural resources may promote conflicts at least in three mechanisms: provide a motive for conflict, because violence may occur due to disputes against benefits; natural resources especially 'lootable' resources, can provide violence opportunities through financing it; resources may cause conflict because of indirect mechanisms: resources can make political institutions weak and making the public bureaucracy effectiveness due to increase of incentives for corrupt behaviour.²

Kenya is among East Africa countries that have gone through significant forest cover loss, mostly for the last two decades. Mostly this is as result of agricultural expansion over rapidly growing population. Poor governance at sectors of forest has contributed to the excision of hundreds of thousands of forest land by the government. This has been pointed out as the major drivers of deforestation that has affected gazetted forest land in the vital water catchment areas like Mau, Mt Elgon and Mt Kenya. Most of forests areas have been cut down which is against the law with view for new settlements.

Mau Forest Complex (MFC) is identified as Kenya's most important water towers. Its health is important not only for communities around the complex and downstream, but for the entire country and others countries as well, because Mau is the major source of important rivers that sap into the Lake Victoria, like the River Nile. Yet this important resource has come under enormous human pressure that caused significant forest degradation with the antecedents of

¹ Alao, Abiodun (2007). *Natural Resources and Conflict in Africa: The Tragedy of Endowment*. Rochester, UK: University of Rochester Press.

² Collier, Paul, and Anke Hoefler (2004). "Greed and Grievance in civil war", in: *Oxford Economic Papers*, 56, 4, 563–595.

conflict. In 1980s, 12,000 hectares were excised in South-Western Mau forest and 15,000 hectares excised in South Nandi forests for settlements. Eventually, reducing South-west Mau from 84,000 hectares to 60,000 hectares and more than 15,000 hectares was reduced for illegal settlements at Maasai Mau.³

Further, by 1993 and 1994, plantation areas and forest were extensively destroyed after a sequence of presidential decrees that permitted evicted settlers after the elimination of the ‘shamba’ system in 1987.⁴ Part of MFC was excised between 1990s and 2000 to settle forest-dwelling communities on focusing to save the remnant forests. Mau East was also reduced to 25,000 hectares from 65,000 hectares. These excisions happened during the time of underfunding of the Kenya Forest Service (KFS) and its failures on plantations regeneration after harvesting. Use of forests product like charcoal remains the key cause of degradation. Weak institutional policies and poor forest laws enforcement have been found as key drivers for Kenya’s forest cover change.⁵

Much of Kenya’s forest areas are protected as Forest Reserves that is under management of the KFS, National Parks management done by Kenya Wild Life Service (KWS) and trust land forests done by Local Authorities.⁶ The indigenous forest cover has about 107,000 hectares of industrial plantation forests owned by public, controlled by KFS and about 90,000 hectares of private plantations for industrial with fuel-wood plantations serving mainly the tea industry. Plantations are mainly located on higher elevations as buffers surrounding forest with indigenous reserves that were preserved for their biodiversity values and water catchment. The plantations are situated in potential areas for agricultural activities with fertile

³ Ochieng, R.M. 2009. “A review of degradation status of the Mau Forest and possible remedial measures”. *GRIN: Publish and Find Knowledge*.

⁴ Ibid.

⁵ Ministry of Forestry and Wildlife (2013). “Analysis of drivers and underlying causes of forest cover change in the various forest types of Kenya”. GoK: Nairobi. Pp 26-42.

⁶ FAO (2007). *State of the World’s Forests*. FAO, Rome.

volcanic soils and reach with rainfalls which are high where rural population densities are also high.

Different stakeholders reside at Mau Block are not limited to indigenous peoples, logging companies being represented, wheat, tea, pastoralist and without forgetting tourism industries among others.

1.2 Statement of the Research Problem

According to conflict theory, environmental conflicts are measured as a sub-sector of public disputes in all shapes and sizes.⁷ There are disputes that can occur in between communities or between decision makers and community or planners, or within a community. The International Environmental Conflicts (IECs) are conflicts that happened due to natural resources utilisation by a country, in a way that has negative environmental outcome for another country or group of countries.⁸ The environmental conflicts are based according to human needs and at local level are over the distribution, allocation and natural resources management.⁹

MFC has been affected by extensive irregular, illegal, ill-planned settlements and unlawful extraction of forest resources regardless of its critical importance on supporting present and future economic development. Forest reserves (excisions) de-gazettement and continuous encroachments have caused destruction of about 104,000 hectares reflecting 24% of the MFC area previously the last 10 years. 61,023 hectares of MFC were excised in 2001 while the remaining 43,700 hectares of protected forest land had been encroached. It is topic of national interest on such wide and on-going destruction of country's key natural assets.

⁷ Carpenter, S. & Kennedy, W. 1988. *Managing Public Disputes: A practical guide to handling conflict and reaching agreements*. London: Jossey-Bass Publishers..

⁸ Trollaldalen, J.M. 1998. *International Environmental Conflict Resolution: The role of the United Nations*. WFED, UNITAR, NIDR

⁹ Kraybill, R. 1995. "Development conflict resolution and the RDP: Towards peaceful development". Track Two (September), 1-8.

This not only presents significant economic and environmental threats, but it also links to a disturbing challenge to the established system of regulation, law and order, with potentially ramifications to internal security and conflicts. Against this background, the study focus on what was the function of the KFS in dealing on such situation and, more importantly, what steps it can take to protect this premier national resource and helping resolve Environmental Conflict in and around the MFC.

1.3 Research Questions

The following questions will guide the research as following:

1. Which are some of the major drivers of land degradation and environmental conflict in the Mau Forest Complex?
2. What role do institutional policies play in causing and/or abetting land degradation and environmental conflict in the Mau Forest Complex?
3. What is the function of the Kenya Forest Service in dealing with issues of land degradation and environmental conflict in the Mau Forest Complex?

1.4 Objectives of the Study

The general objective of the study was to find out the causes and manifestations of land degradation and environmental conflict in the MFC and how they interfere with the mandate and work of the KFS. The study attempted to explore how such conflicts may be prevented or resolved peacefully. The researcher examined this larger objective based on specific objectives as follows:

1. To examine the key drivers of land degradation and environmental conflict in Africa and even in the Mau Forest Complex.

2. To examine the role of institutional policies in abetting land degradation and environmental conflict in Kenya.
3. To evaluate the function of the Kenya Forest Service in dealing with issues of land degradation and environmental conflict in Kenya, with specific reference to the Mau Forest Complex.

1.5 Literature Review

This literature review examined major drivers of land degradation; assessed the effects of land degradation, including its potential for conflict; dynamics and impacts concerning land degradation in Africa generally; identified the effects of land degradation in the MFC, and; analysed the role of regional and national institutions like Kenya Forest Services (KFS) to handle land degradation and conflicts in the MFC.

Land Degradation and Environmental Conflicts in Africa: An Overview

The 2005 Millennium Ecosystem Assessment (MEA) identifies land degradation to refer to as ‘loss of its services, more particularly the initial production services’.¹⁰ Land degradation may mean permanent or temporary reduction of the productivity capacity of land because of human action. Degradation of land is acknowledged as a widespread problem, and is severe in some areas. Degraded land is affecting an approximated 1.5 billion people and a quarter of land service around the world.¹¹ However, exact extent and severity of degradation of land in the sub-Sahara Africa (SSA) has not been agreed up on. Indeed, the main obstacles

¹⁰ MEA (Millennium Ecosystem Assessment), 2005. “Dry land Systems”. In *Ecosystem and Well-Being: Current State and Trends*, edited by R. Hassan, R. Scholes, and N. Ash, 623–662. Washington, DC: Island Press.

¹¹ Lal, R., Safriel, U., & Boer, B. (2012). *Zero Net Land Degradation: A New Sustainable Development Goal for Rio+ 20*. [A report prepared for the Secretariat of the United Nations Convention to Combat Desertification].

for improving productivity in agriculture, reduction of degradation of land and its management sustainable facilitating were due to missing of information and knowledge.¹²

Degradation of land assessment within the region varies in the outcome and methodology.¹³

The Global Assessment of Soil Degradation (GLASOD) survey of early 1980s concluded that approximately 16.7% of SSA was experiencing serious human-induced degradation of land.

Therefore in 1990, appositely 20% of SSA was affected by slight extreme degraded land which was reported through standardized criteria and expert judgment. GLASOD relied on record structuring of the severity, type and deepen extent of degradation even its key causes.

The land degradation ‘hotspots’ map shows that Kenya, Ethiopia, Tanzania and Malawi were the most affected within Eastern Africa region.¹⁴ GLASOD data indicate that approximately 25%, 14%, and 13% of land cover is degraded in Kenya, Ethiopia, and Tanzania respectively.

No other uniform survey globally with source of data of land degradation apart from GLASOD.¹⁵

Recently, the United Nations’ Food and Agriculture Organisation (FAO) has used TERRASTAT, a satellite-based system that studies and reports on land resource statistics at regional and county level.¹⁶ The data of TERRASTAT set classifies the degraded of land through degree of relative severity of degradation. For SSA, there exist four sub-categories of land degradation; (24%) is light, (18%) moderate, (15%) severe and (10%) very severe.¹⁷ It

¹² Liniger, H. P., et al; (2011). *Sustainable Land Management in Practice—Guidelines and Best Practices for Sub-Saharan Africa*. TerrAfrica, World Overview of Conservation Approaches and Technologies (WOCAT) and Food and Agriculture Organization of the United Nations (FAO).

¹³ Zucca, C., et al; (2014). “The Role of Soil Information in Land Degradation and Desertification Mapping: A Review”. In *Soil Security for Ecosystem Management* (pp. 31-59). Springer International Publishing.

¹⁴ Vlek, P., Le, Q.B., Tamene, L., 2010. “Assessment of land degradation, its possible causes and threat to food security in Sub-Saharan Africa”. In Lal, R., Stewart, B.A. (Eds.), *Food Security and Soil Quality*. CRC Press, Boca Raton, Florida, pp. 57 - 86.

¹⁵ Yalew, A. W. (2014). “Natural resources management and agriculture in Sub-Saharan Africa”. *Research Journal of Agriculture and Environmental Management*. Vol, 3(1), 004-010.

¹⁶ Yesuf, M., et al; (2008). *The impact of climate*. Available at: http://gcmd.nasa.gov/records/GCMD_terrastat.html (Accessed June 8, 2016).

¹⁷ Nkonya, E., et al; (2013). *Economics of Land Degradation Initiative: Methods and Approach for Global and National Assessments* (No. 158663).

shows that in Ethiopia, for example, (32%) degradation was indentified in sparse vegetation areas. In Kenya (46%) of degradation occurred in area with forest while 42% each was noted at shrub-land, crop and mosaic vegetation.¹⁸

The Total Economic Value (TEV) is used as useful concept for understanding the costs of land degradation that is sub-divided broadly into two categories; use and non-use values. The former refer to direct and indirect use: Direct use can be marketed outputs including priced consumption such as fisheries, crop production and tourism and even un-priced benefits (such as recreation value). Indirect use value may refer to un-priced ecosystem functions like water purification and carbon sequestration. Often non-use value can be sprinted into three categories; bequest, altruistic and existence values. The un-priced market has three benefits. The land under values and its provision of ecosystem services is caused by untraded in markets, even though their output has higher rates of degradation of land.¹⁹

Failure of institutions and poverty are indentified as causes of degradation of resource. Degradation of land is believed to be contributing to agricultural productivity decline thus leading to increases in poverty.²⁰ Poor soil properties, shallow soil and topographic conditions in marginal land make it unsuitable for production and with higher prone to degradation. The causes of land degradation can be placed into two categories, the underlying and proximate cause. The direct effect factors on the terrestrial ecosystem are classified as proximate causes. They may include biophysical (natural) conditions related to event of extreme weather such as droughts, coastal surges climatic conditions which may cause land to become saline. Proximate causes are similar to unsustainable management of land practices (anthropogenic) like over-cultivation, excessive forest conversion and overgrazing

¹⁸ FAO (2011). *Sustainable Land Management in Practice Guidelines and Best Practices for Sub-Saharan Africa*. Rome, 2011.

¹⁹ Barbier, E.B. (2011a). *Capitalizing on Nature: Ecosystems as Natural Assets*. Cambridge University Press, Cambridge and New York, 321 pp.

²⁰ Barbier, E.B. 2011b. "Pricing Nature". *Annual Review of Resource Economics* 3:337-353.

while factors that are indirectly affect proximate causes are underlying causes. Filer to have proper institutions, insecure of land tenure and poverty can lead to degradation of land through incentives hampering to invest in the sustainable land management (LM) practices.²¹

Soil erosion is the other major proximate causes to unsustainable agriculture: herds overstocking, land clearing, charcoal burning, wood extraction, burning of bushes, pollution of land and water sources, mining, soil nutrient and steep slopes cultivation. The continuous demand for agricultural land, charcoal burning, fuel-wood, material for construction, timber logging for large-scale and people resettlement in forested areas are linked to deforestation processes. This often occurs with the connivance of ineffective institutional mechanisms to preserve forests.²²

Costs and Consequences of land degradation in Kenya

The degradation of land in Kenya has substantial social, economical and environmental costs. Agricultural Land productivity capacity is reduced by degraded land, forest and rangelands resources. The end results of land degradation include costs of lost in nutrients through erosion of soil, lost of production because of nutrient, loss of soil and livestock carrying capacity. The indirect costs may refer to environmental services loss, groundwater capacity reduction, dams and river beds silting, loss of social and community because of poverty and malnutrition.

Approximately 75% of the Kenya's population reside in rural area. Thus the economic consequences of degradation of land are high because approximately 90% of the rural population live in agricultural-based area. Soil richness degradation is believed to be most

²¹ Pingali, P., Schneider, K., & Zurek, M. (2014). "Poverty, Agriculture and the Environment: The Case of Sub-Saharan Africa." In *Marginality* (pp. 151-168). Springer Netherlands.

²² Rademaekers, K., L. Eichler, J. Berg, M. Obersteiner, and P. Havlik (2010). *Study on the evolution of some deforestation drivers and their potential impacts on the costs of an avoiding deforestation scheme*. Rotterdam, The Netherlands: European Commission Directorate-General for Environment.

essential for food security limit in SSA.²³ One study found up to 50% turn down in productivity in agricultural of some yield lands in SSA appropriate to degradation of land processes.²⁴ It is approximated that 72 tons in every hectare per year of water failure was because of soil erosion in Kenya.²⁵

Wind and water erosion have been recognized as the widest types of land degradation in the country. The major proximate causes of earth degradation may include: climatic conditions, landscape, unsuitable use of arable land and unsuitable management of land practice like burning up of agricultural and slash, overgrazing, cutting bushes and trees, cultivation on steep slopes, shrub burning, contamination of both land and water sources, mining and soil nutrient. At the equal time, the critical essential causes of degradation of earth include socioeconomic and institutional factor for example land tenure lack of confidence, poor quality, density of population and fragile policies and regulatory environment in the agricultural and environmental sectors. Unconfident land tenure can act like a hindrance to sustainable agricultural practices investments.

Some studies noted that poverty and degradation of soil make a vicious cycle: poverty can cause degrading of lands. Without proper governance to deal with the growing population, land degradation will lead to conflict.

Land degradation and environmental conflicts in Kenya's Mau Forest Complex

In the MFC, land degradation had been caused mainly by bigger human population pressure demanding for extra settlement land, pasture and agriculture. These land apply systems are time and again in conflict themselves, as pastoralists prefer to use the land as rangelands

²³ Verchot, L. V., Van Noordwijk, M., Kandji, S., Tomich, T., Ong, C., Albrecht, A., & Palm, C. (2007). *Climate change: Linking adaptation and mitigation through agroforestry. Mitigation and Adaptation Strategies for Global Change*, 12(5), 901-918.

²⁴ Lal, R. (1995). "Erosion-crop productivity relationships for soils of Africa". *Soil Science Society of America Journal*, 59(3), 661-667.

²⁵ Oldeman, L.R., 1994. "The global extent of land degradation". In Greenland D.J. and I. Szabolcs (Eds.), *Land Resilience and Sustainable Land Use*, pp. 99-118. Wallingford, UK, CABI.

where the livestock may be authorized to roam freely, while farmers would want to fence off the land, including right to use them as water points.²⁶

Tensions are especially potent in situations where host communities who are already dealing with environmental scarcity as they struggle for resources while they confront newcomers from other ethnic identities. The Mau has been incorporated into network of state supremacy and patronage, which unwittingly supplied the justification for large-scale excisions of the forest, experiencing existing tensions and even creating new fault lines. The interaction between political patronage, ethnicity and environmental expediency is illustrated by plight of the community of Ogiek as is used here to represent evolution of such conflicts and natural history.

The community of Ogiek have resided in the forest gathering and hunting even before colonial times, but the colonial government never recognize their claims to the forest. Historically, the Ogiek had extend out across Kenya's forests, but they did not robust neatly into the ethnic "reserves" that was created by colonial government to hold Africans in well-defined territory and to protect land expropriate for white settlers. In fact, the official policy of colonial government on the Ogiek was that they were to be assimilating into other communities.²⁷ The Ogiek resisted this move and continued claiming and residing in the MFC. Currently, approximately between 15,000 and 16,000 Ogiek survive in the MFC.²⁸

Throughout Kenya's history, the check and balance failed in the settlement schemes and have allowed authority to establish who has right of entry to high potential land. Thus, political followers, friends, and relatives are favoured and the settlements extended beyond their

²⁶ Karanja, A., China, S. S. & Kundu, P. M. (1986). "The influence of land use on the Njoro River Catchment between 1975 and 1985". In: *Soil and Water Conservation in Kenya*. University of Nairobi, Nairobi, Kenya.

²⁷ *Report of the Kenya Land Commission* (London: His Majesty's Stationary Office, 1934), 260.

²⁸ A. Ochola, "Rescuing a forest plundered by its custodians." *East African Standard*, 10 July 2006.

original borders. This is single reasons why the Kenya's families of earlier period two presidents own huge tracts of land²⁹ and Kenya own top levels of land inequity in the world.³⁰

Forest sector in 1990s, was placed under the Ministry of Environment and Natural Resources. Under the Forest Act then in force, the Minister could alter boundaries simply by publishing that target and a drawing it in the Kenya Gazette. As the Minister was a politically appointee to the President, one could make decision on how forest excisions subject to the politics of patronage. With the move on Kenya multi-party politics by the end of 1991, high-level state actors used these institutions to leverage forests to buy support and fund campaigns as it was valuable patronage resources.³¹ As one Ogiek activist noted “since trees are acquired free of charge, they bring millions once transformed into timber and this free money could be used in financing elections besides buying political support.”³²

The United Kingdom funded the first stage of the Kenya Indigenous Forest Conservation Kenya Programme (KIFCON) there by 1991 and 1994 which was meant to benefit both environment and the local people. The project recommended that Ogiek families be settled in a suitable sector of the forest. However, this recommendation and the list that it generated was soon hijacked and used to further marginalise the Ogiek. Out of a primary KIFCON approximate of 1,800 families, the new record rose to 3,500, of which it was claimed that only 200 were Ogiek. By the time the first settlement scheme (25,000 hectares) commenced in Kiptagich, in southwest Mau in 1996, the families number had rose to 9,000.³³

²⁹ Otsieno Namwaya, “Who Owns Kenya?” Internet, <http://blog.marsgroupkenya.org/?p=92> (Accessed: 1 June 4th 2016).

³⁰ *World Bank Kenya Poverty and Inequality Assessment* (1997; 2006). World Bank, Washington, DC, p. 18.

³¹ Republic of Kenya (2004). *Report on the Commission of Inquiry into the Illegal/Irregular Allocation of Public Land*. (Nairobi: Government Printers) 83, 150-9.

³² Towett Kimaiyo, *Ogiek Land Cases and Historical Injustices 1902-2004* (Nakuru: Ogiek Welfare Council, 2004), 88.

³³ Daily Nation, “How Moi allies acquired land meant for Ogiek,” Internet, <http://www.nation.co.ke/News/-/1056/818058/-/vnkkoe/-/index.html> (Accessed: 5 June 2016).

As it has been demonstrated, the struggle over revival of MFC and reforestation was correlated even to social and economic forces, but to ethnicity, patronage, politics and power as well thus making it hard to return it to its former position. This explain why people in Mau with claims of land rights at the forest oppose eviction and raises questions over the validity of title deeds issued on the gazetted forest land. Long term forestry resource management, reconciliation and conflict resolution interventions are needed to resolve these issues.

Local and National policies over and above programs take part in a critical role in affecting farmers' decisions regarding to land management. Exact programs and policies that affect many of these institutional factors and socioeconomic comprise those relating to agricultural research, land governance, irrigation, extension, infrastructure development, admittance to credit and famers' cooperatives, regulating input and output markets and organizations. This calls for robust policy and intervention of administration and an effective oversight system. Thus, to properly play that function, the KFS must take responsibilities of these perspectives and in addition, invest in decision of conflict capacity building.

Knowledge Gaps

The link between land degradation, resource scarcity and conflict has received a great deal of attention in modern scholarship. On the other side, the correlation between environment and conflict has been epitomized in the 'resource wars' argument. Numerous studies have explored the conceptual intricacies on how to counter resource-related risks. However, experiential studies of the outcomes of measures in respect to risk mechanisms of resource-related remain scarce. There is a dearth of specific empirical literature of academic on this particular topic of research highlighting the role of KFS, hence this Study.

1.6 Hypothesis

H1: Land degradation in the Mau Forest Complex contributes to environmental conflict and poses a challenge to security and stability for the communities.

H2: The Kenya Forest Service does not play a pivotal function in managing environmental conflicts in the Mau Forest Complex.

1.7 Justification of the Study

Challenges created by developing efficient responses strategic function of natural resources in the fast-changing global political economy is a priority for governments around the world. It has been argued that endowment of resource and Africa's conflict are almost synonymous.³⁴ Natural resources encourage conflicts through at least three mechanisms: provide a intention for conflict, since violence is caused by disputes due to benefits; natural resources, mostly the lootable resources, can provide opportunity for violence by financing it; resources may cause conflict during indirect mechanisms: political institutions might be weakened by resources and destroy efficiency of public bureaucracy where they raise the incentives for corrupt behaviour.³⁵

However, some basically peaceful and stable resource-exporting countries show that natural resources do not essentially lead to violent conflict. Therefore, the appearance or lack of conflict depends on some more conditions.³⁶ Recent studies argue that management of resources can assist to avoid resource-related conflicts and can even aid the funding of

³⁴ Abiodun Alao, 2007. *Natural Resources and Conflict in Africa: The Tragedy of Endowment*. Rochester, UK: University of Rochester Press.

³⁵ Collier, Paul, and Anke Hoeffler (2004), "Greed and Grievance in civil war", in: *Oxford Economic Papers*, 56, 4, 563–595.

³⁶ Shabafrouz, 2010. Shabafrouz, Miriam (2010a), *Oil and the Eruption of the Algerian Civil War: A context-sensitive Analysis of the Ambivalent Impact of Resource Abundance*, GIGA Working Papers, 118, online: <www.giga-Hamburg.de/workingpapers> (April 10, 2016).

peace-related needs like economic development and cost of health care.³⁷ The KFS is thus singularly placed to both advocates for the right policy frameworks and even to judiciously manage the resources of the forest of the MFC. Thus, a possible solution to the problem of degradation of soil and resource conflicts in the MFC would have far reaching ramifications for peace, steadiness and development in Kenya, also for Africa and the whole world.

History documents how resource-based conflicts have added to highly destructive wars in Karamoja and Kagera regions of Uganda, Darfur area of Sudan, in the Rwanda and Niger Delta genocide. The aerial survey of MFC destruction done on 7th May 2008 with help of the UNEP, the ministry of Environmental and Mineral Resources, had documented the extraordinary level of obliteration and Mau ecosystem degradation. Thus, land degradation and environmental conflict in the MFC present a clear and present threat, not just to Kenya's domestic political stability and achievements of its goals under Vision 2030 of Kenya, however it has significant regionally and international threats as well.

This study helps unravel some of the main factors that have continually contributed to degradation of land and environmental conflict in the MFC. It helps throw some light on the fundamental causes of similar degradation and its concomitant conflicts, thus affording all the concerned agencies and authorities the singular hope of instituting effective counter-measures at the most nascent level, the resource management and conflict prevention and its management. That way, many lives may be saved as destructive rhetoric by politics, who often whip up ethnic and political tension, can be headed off. That would also help in ensuring harmony and stability and throw in towards the achievement of Vision 2030 of Kenya goals, among others. For the academic community, this study provides contemporary insights on particular aspects of environment conflict in a forested ecosystem such as the

³⁷ Le Billon, 2008; Le Billon, Philippe (2008), *Resources for peace? Managing revenues from extractive industries in post-conflict environments*, New York: Center for International Peace.

MFC. It presents clear findings and recommendations that would be useful to researchers, students, policymakers and administrators at the KFS, among other key players and stakeholders.

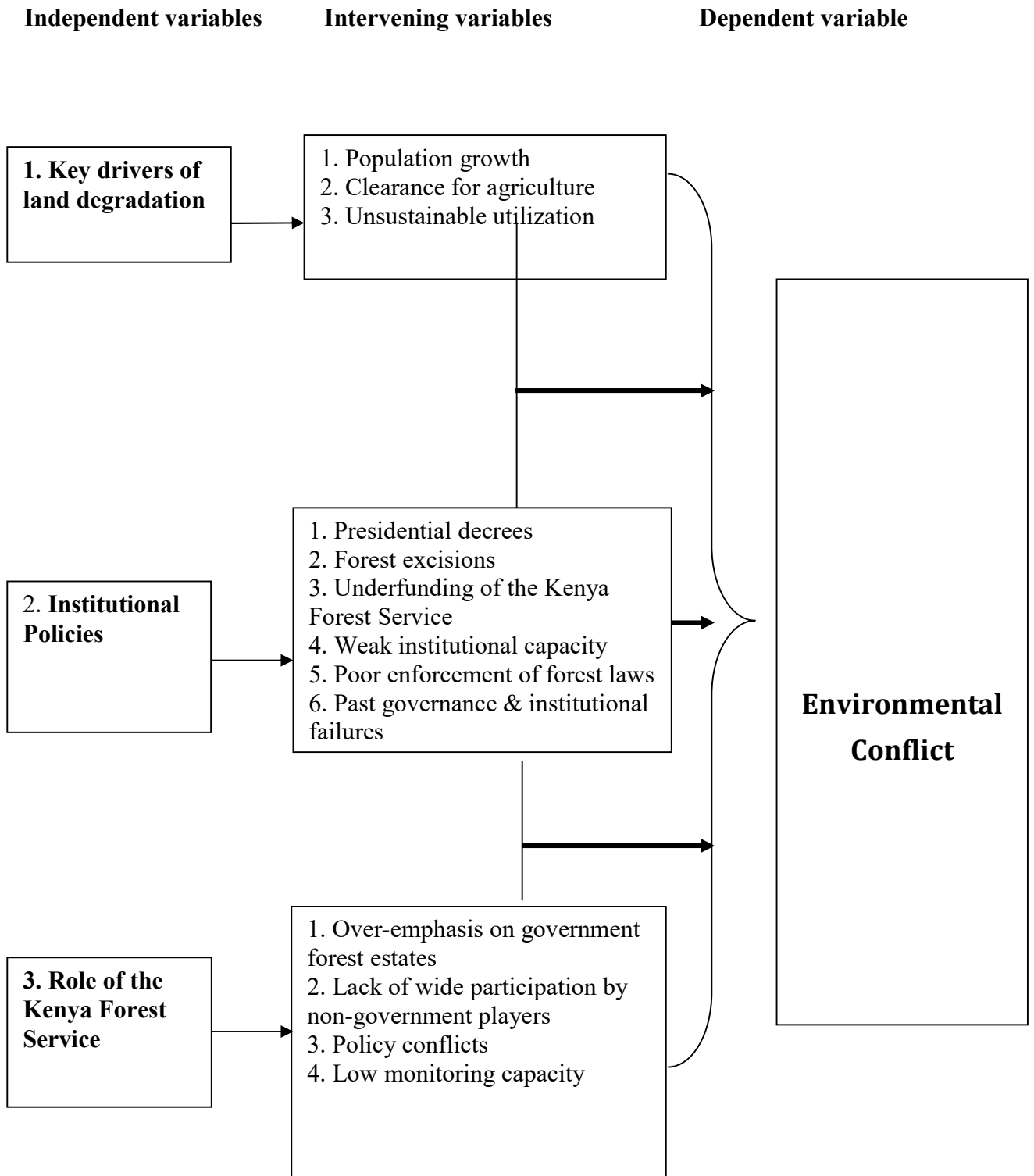
1.8 Conceptual Framework

Kenya's rural population is intense in what are termed 'high' and 'medium-potential' agro-ecological zones in which rainfall levels are adequate enough to support agriculture. Surprisingly, these are also area where water towers and closed canopy forests like as the MFC are located. Other agro-ecological zones, population increase rates for previous four decades have been very high. The high population increase rate has driven agricultural expansion, which is believed as major driver of forest cover loss in Kenya. The principal drivers of degradation of land and environmental conflict, including forest cover loss, clearance for agriculture that is linked to rural poor quality and rapid growth of population; unsustainable utilization like timber harvesting, production of charcoal, grazing in forests; the past institutional failures and entire governance in forest sector.³⁸ There is need to examine these factors in detail and see just how they can lead to conflict.

Three major variables identified therein in bid to know the truth of the factors that affect soil degradation and thus cause environmental conflict. Thus, a conceptual framework was developed that contain three independent variables and one dependent variable environmental conflict. The conceptual framework is shown in Fig. 1.1.

³⁸ Ministry of Forestry and Wildlife (2013). *Analysis of drivers and underlying causes of forest cover change in the various forest types of Kenya*. GoK: Nairobi. Pp 26-42.

Figure 1.1: Conceptual Framework for the Factors of Land Degradation Affecting Environmental Conflict in the Mau Forest Complex



1.9 Research Methodology

The study utilised companion primary and secondary sources of data. Secondary data was interrogated to get a better understanding of the literature on the land and forestry resources, land degradation, resource depletion, and environmental conflict. This was sourced through both library and internet research on published sources, including books, reports and journal articles, print and online. This study used the descriptive research design. This method is used to get information that seeks to know how people perceive issues and how the information collected in a research is analyzed, recorded and reported.³⁹ The two basic of research approaches are: quantitative and qualitative approaches. The quantitative approach deal with the generalisation of data in a quantitative manner which can be subjected to accurate quantitative analysis in a formal and firm fashion, while the qualitative research approach deal with subjective appraisal of attitudes, opinions and behaviour. The study used questionnaires, focus group interviews, and major informant interviews to collect primary data. The target groups included environmental scholars and academicians, environmental policymakers at relevant government institutions as well as key officers at the KFS in Nairobi, local leaders and residents of the MFC area.

1.9.1 Research Site and Target Population

The research site explains the research location and clearly outlines the location geographically and the reason for the preference of the location within which the study. For this particular study, the research covered two main locations, namely Nairobi and the MFC region. In Nairobi, the study sampled environmental scholars, academicians even officials and policy makers in relevant government sections and agencies while, at MFC areas, it

³⁹ Kothari, C. R. (2004). *Research methodology: Methods and techniques*. (2nd Ed.). New Delhi: New Age International Publishers.

sampled local leaders and residents. The MFC covers over 290,000 hectares and is located approximately 250 km from Nairobi. It borders Nakuru on the North, west of Kericho and south it border Narok. The lager Mau is formed by seven blocks comprises of South West Mau, East Mau, Transmara, Western Mau, Mau Narok, Maasai Mau and Southern Mau. Among the seven blocks, only Maasai Mau is yet to be gazetted. To make the task manageable, the study concentrated on the South West Mau.

1.9.2 Sample Size

A sample is a segment of a part that represents the larger whole. A sample of the population possesses the same characteristics as the population and is considered a smaller version and a rep of the entire population under researcher’s investigations. The sample size for this research was obtained using the formulae for a target population of less than 10,000 scientifically computed as follows⁴⁰:

$$nf = \frac{n}{1+n/N}$$

Where

nf = Sample size (when the population is not more than 10,000).

n = Sample size (when the population is greater than 10,000); 384.

N = Estimate of the population size; 51

The sample size for this study was calculated as follows:

$$nf = \frac{384}{1+384/51} = 45 \text{ Respondents}$$

Using the above formula, the sampling proceeded are summarised as in the table below.

⁴⁰ Mugenda, O.M & Mugenda. A.G (1999). *Research methods. quantitative and qualitative approaches.*(pp. 46 - 48). Nairobi, Kenya: ACTS Press.

No	Target Group	Target Population	Sampling Procedure	Sample Size
1	Researchers and officials at the Kenya Forest Service	35	41/ 51x45	31
2	Local leaders around the Mau Forest Complex areas (South West Mau)	6	6/51x45	6
3	Local residents around the Mau Forest Complex areas (South West Mau)	10	15/51x45	9
	Total	51		45

Table 3.1: Sampling Procedure and Sample Size

1.9.3 Sampling Procedures

Data are mainly of two types: primary and secondary data. This study used purposive and snowball sampling to select and interview respondents in the identified categories in the two main research sites. It used primary and secondary data since valid research can equally be done out on data already collected by someone else.

1.9.4 Data Collection Procedures

There are numerous ways that a researcher can employ in collecting data. Data collection can be quantitative or qualitative. This study employed aspects of qualitative, quantitative and descriptive approaches to both collected data and make logic of the data. The questionnaires used checklist and rating scales. Mainly, however, the Study used a qualitative data collection method that relied on purposive and snowball sampling and structured data collection instruments that shape predetermined response categories as already identified.

1.9.5 Data Processing and Analysis

It is the method of bringing the order and meaning on the information collected.⁴¹ The qualitative and quantitative data collected in this research was collected and offered specific according to the study's objectives. The study objectives here are reflected in the sections within the survey instrument. The researcher utilized equally quantitative and qualitative data to find out the factors. Quantitative data was extracted through frequency tables and diagrammatic presentations, thus allowing for visual clearness of data presented, which are presented in the research results in Chapter Four. Qualitative information gathered through the survey instrument formed portion of the perspectives highlighted in the analysis.

1.10 Scope and Limitations of the Research

The geographical extent of this study was limited to Kenya, with much of the information to be collected within Nairobi and in the Mau Forest Complex. As Kenya's seat of government offices, commercial and industrial center, are based in Nairobi with entire relevant regulatory and oversight institutions like KFS and the Ministry of Environment and Natural Resources. Nairobi is center of academic research, so it facilitated access to some of the leading scholars in the topic of this project. For these reasons, and also for practical considerations of effective reach, the study used Nairobi and the South West Mau region as its twin centers of focus.

This Study was limited due to several subject matters. In terms of primary data collection, it was limited in its geographical scope to Kenya, even though its implications will be valid for the other Eastern Africa region, at least. Otherwise the paper was subject to several other constraints including: logistical challenges that may prevent the researcher from physically sampling a maximum number of respondents; inadequate finances; time factor as the researcher is a full time employee; and the course requirements itself for projects of this

⁴¹ ⁴¹ Mugenda, O.M & Mugenda. A.G (1999). *Research methods. quantitative and qualitative approaches.*(pp. 146 - 148). Nairobi, Kenya: ACTS Press.

nature. In addition, the researcher noted that land issues and resources, including their ownership, distribution and governance, are very sensitive in Kenya. The researcher noted that respondents may be subject to fear of victimization for ‘speaking out’, while government officers may be reluctant to be seen to criticize the government or its policies on the subject matter.

1.11 Chapter Outline

This Section provides the layout of the research study. Chapter One introduces the topic of our research study by first setting the broad context of our research study, statement of the problem, research objectives, justification, theoretical framework, hypotheses and the methodology of the study.

Chapter Two provides research perspectives on land degradation and environmental conflict in Africa and in the MFC in Kenya. It explores the issues around deforestation, land degradation, resource depletion and environmental conflict, with a specific reference to the MFC. It also point out the function of the KFS in conservation of forest in Kenya.

Chapter Three delves into detail on the matter of environmental conflict and various ways where conflict resolution theories and methodologies can be applied for more positive outcomes. Chapter Four discusses the summary findings and conclusions of the Study, while Chapter Five gives the recommendations from the study.

CHAPTER TWO

LAND DEGRADATION AND ENVIRONMENTAL CONFLICT IN THE MAU FOREST COMPLEX

2.1 Introduction

This Chapter provides research perspectives on land degradation and environmental conflict with specific reference to the MFC. It examined the issues around deforestation, land degradation, depletion of resources and environmental conflicts. It also point out the function of the KFS in conservation of forest in Kenya.

Environmental conflict results from environmental shortage of a natural resource which affects the ecosystem equilibrium. As such, among the main causes of environmental conflict is environmental shortage of resources which are renewable. Such a scarcity can be caused by growth in population, resources unequally distributed and environmental change.⁴² The global framework for environmental conservation is supported by the UNEP. Guidelines for Land Policy, the African Union continental Framework and Land Reforms in Africa is a vital tool aimed at assisting regional and national processes for policy formulation of land and implementation, with a sight to promoting land productivity, rights, and securing livelihoods.

At the regional level, Kenya being member of the Inter-Governmental Authority on Development (IGAD), which comprises the countries of Somalia, Djibouti, Sudan, Eritrea, Kenya, Ethiopia, and Uganda. The collective gross domestic product (GDP) of the region of IGAD by 1999 was approximated at US\$ 35.9 billion, representing an average per capita GDP of US\$ 233. Agriculture is the economic foundation of IGAD in the area that has heavy dependence on environment and natural resources. As such, IGAD pursues a sustainable and

⁴² Homer-Dixon, T.F. (1999) *Environment, Scarcity, and Violence*. Princeton: Princeton University Press.

trans-boundary of management of natural resources and defence of environmental. Regarding the management of sustainability of biodiversity and utilise, such as, it requires member countries to prepare National Biodiversity Strategy and Action Plans (NBSAPs). The same can be used to share information, build institutions and implement hub programmes designed in promoting wise use of biodiversity.⁴³

At East African Community (EAC) level, the State's Partners recognise their susceptibility to natural resource hazards like droughts, landslides, floods, earthquakes, lightning, urban fires, human-induced disasters of conflicts, and environmental degradation have evolved a joint approach in handling the issues.⁴⁴ Land and national resources degradation are grave problem within the region. Eastern Africa in general has limited forest and woodland cover of about 13% of the whole area. It is approximated that forest change wrap within the region is 0.51% per year.⁴⁵

Kenya retains a robust institutional and legal structure which deals with conflict of environmental and either determine or manage them. These institutions can be identified as the law courts and tribunals under various Acts.⁴⁶ The National Environmental Management Authority, Environmental Tribunal, Public Complaints Committee and other informal communities relied on resource governance bodies. The laws can combine the numerous statutes that address the challenges of environment like Environmental Management and Coordination Act (EMCA), Public Health Act, Forest Act, Water Act and various statutes dealing with land.

⁴³ Inter-Governmental Authority on Development, 2007. *IGAD Environment and Natural Resources Strategy*. IGAD: Addis Ababa. p 1-18.

⁴⁴ *East African Community Disaster Risk Reduction and Management Strategy* (2012 – 2016). EAC Secretariat Arusha, Tanzania.

⁴⁵ United Nations Environment Programme. *Africa Environment Outlook: Past, Present and Future Perspectives*. Nairobi, UNEP, 2002.

⁴⁶ They include the Land Disputes Tribunal established under the Land Disputes Tribunal Act 1990, the Provincial Land Appeals Board and Central Land Appeals Board under the Land Control Act (Cap 302) , etc.

Even though we have the survival of the above said laws and institutions, environmental conflict have continued them to manifest in Kenya, which conflicts are well documented.⁴⁷

Some communities such as Maasai, Meru, Giriama and others still contain councils of elders who sit together to resolve their disputes erupting in between their communities. Decision of environmental conflicts has mostly been attempted through legal frameworks and institutions, including the oversight function of the KFS.

2.2 Importance of Forests to the Economy

Kenya's resources from forest are of great importance to urban and rural water supplies, and in addition they support the production of hydro-electric power, which supplies more than 70% of the country's power needs. In addition, much of Kenya's biodiversity and wildlife resources, which are the main component of the country's thriving tourism industry depend on forests. A larger rural inhabitant depends on forests to supply charcoal and firewood. By mid-1990, it was approximated that industries with sawmilling provided concerning 30,000 direct employments and 300,000 indirect jobs. About 1% of the GDP was approximated have been generated by forest zone by 2007, and over 10% of households living inside five kilometres from forest reserves depended on them for subsistence resources.

2.3 Environmental Degradation and Deforestation Processes in Kenya

People's vulnerability to resource depletion depends on the level to which natural resources and ecosystem services and also their ability to acclimatize to changes in these resources. For the purposes of definition, deforestation means destruction of forest wrap and the change of forests into other land uses. Otherwise, forest degradation describes processes which do not

⁴⁷ The Akiwumi Report of the Judicial Commission Appointed to Inquire into Tribal Clashes in Kenya (31st July, 1999) notes the contribution of the issue of land to violent conflicts in Kenya due to the way it is treated with fervent sentimentality and sensitivity and in many ways, considered explosive. The report at pg. 53 notes that "Whereas, the constitution guarantees the right of ownership of property anywhere in the country, the peaceful co-existence of the forty two tribes that live within our national borders, appears to have been profoundly undermined by diverse man-made problems that are either directly or indirectly connected to land."

convert forest lands to non-forest purpose but reduce the quality or impair the functioning of forest ecosystems by interfering with structure, spatial distribution, crown cover, diversity and related attributes. Either way, resource depletion can be a national issue of security. The risk to security of National can be both cause and consequence of human insecurity.

While deforestation and land degradation processes in Kenya can be tacit within the political and socio-economic changes in Kenya previous and after its political independence until now, it is significant to appreciate Kenya's situation within an Africa-wide context. This is because deforestation has become a global issue related to global climate change discussions which lead to the Bali Action Plan. The Bali Action Plan noted the enhancement and preservation of forest carbon as an economically feasible option toward climate change mitigation.⁴⁸ savings in conserving and managing Africa's forests sustainably, tackling proximate, sufficiently managing fires, and maintain causes in adjacent sectors in agriculture, energy and infrastructure, will assist alleviate the global climate change rate.

The fundamental drivers of land degradation and deforestation have been observed as complex and often lie exterior of sector of the forest. A few major drivers of land degradation and deforestation identified include: Policies – excisions, they over-emphasis on forest estates of the government instead of a wider contribution by non-government players; policy conflicts settlement, agricultural policies, agricultural expansion, firewood and poles harvesting, and low monitoring capacity.⁴⁹

For the last two decade, Kenya has skilled considerable losses in forest cover. The major reasons included growth in agricultural and a rapidly growing population. Poor governance within the forest sectors has been solely most important driver of deforestation which

⁴⁸ Stern, N. (2007). *The Economics of Climate Change: The Stern Review* (Cambridge: Cambridge University Press).

⁴⁹ Mugisha, S (2002). *Root causes of land cover/use change in Uganda: An account of the past 100 years*. LUCID Working paper No.14. Int. Livestock Res. Institute. Nairobi. Available at www.Lucideastafrica.org. (Accessed 23 May 2016).

affected the gazetted forest land in vital water catchment areas like Mau Forest, Mt Elgon and Mt Kenya. Huge areas of forests cover were also cleared to cater new settlements and during illegal logging. 12,000 hectares of forest wrap were cleared in South-Western Mau forest and 15,000 hectares in South Nandi forests for settlements in late 1990s. Thereafter, South-west Mau forest was reduced to approximately 60,000 hectares from 84,000 hectares, while Maasai Mau forest has since rehabilitated over 15,000 hectares into unauthorized settlements.

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It was noted that on diverse dates between 1993 and 1994 areas with forest plantation were extensively burned after a sequence of presidential decrees, which legalized the return of settlers previously evicted following the elimination of the 'shamba' system in 1987.⁵¹ A section of MFC was excised between 1990s and early 2000 to settle forest-dwelling communities with aspire of saving the remnant forests, while Mau East was reduced to 25,000 hectares from 65, 000 hectares. When those excisions of injudicious took place it was coincided that the KFS was underfunded and there were regeneration failures of plantations after harvesting. Utilization of forests for charcoal was and still is assumed to be the key cause of degradation. Weak institutional policies and deprived enforcement of forest laws have been identified also as major drivers of forest wrap change in Kenya.⁵²

2.4 The Concept of Forest Transition

The Forest Transition (FT) model tries to explain the overall human induced changes of forest wrap over time. It presents the various combined effect of drivers at national scale. It gives an inverse J-shaped trajectory which may be wrecked into four phases: Pre-transition,

⁵⁰ Ochieng, R.M. 2009. "A review of degradation status of the Mau Forest and possible remedial measures." *GRIN: Publish and Find Knowledge*.

⁵¹ Ochieng, R.M. 2009. "A review of degradation status of the Mau Forest and possible remedial measures." *GRIN: Publish and Find Knowledge*.

⁵² (Ochieng, 2010).

early-transition, late-transition and post-transition phases.⁵³ The phases of transition are associated by drivers of varying significance that include: Agricultural expansion, which dominates the early and transition phases; fire wood and fires, which are in the late post transition phases become extra dominant; subsistence agriculture, which is quite stable in all phases, and; urban expansion which is largest in the post-transition phase. Kenya is placed by the study in the late transition phase.⁵⁴

2.5 The Linkages to and Perspectives on Environmental Conflict

Disputes of environmental can happen among communities or a centre of a community and decision makers, in a community or with planners. International environmental conflicts are conflicts that occur due to the use of natural resources by a country, in a way that lead to negative environmental consequences for another country or group of countries.⁵⁵

Without doubt, problems of water shortage, deforestation, and land degradation in the world which are developing often foster wars, illegal emigrants and contribute to legal asylum seekers to the first world. Scholars have made a model of conflict driven by growth of population in the states which are irresponsible in the developing world, arguing that problems of water shortage, deforestation and land degradation in the world which are developing foster wars, illegal emigrants and contribute to legal asylum seekers to the first world. In addition, countries which are overpopulated, environmentally-stressed or both risk of being politically stressed, and their governments can collapse.⁵⁶ In the same vein, a UNEP

⁵³ Mather, A., 2001. "The transition from deforestation to reforestation in Europe". In: Angelsen, A., Kaimowitz, D. (Eds.), *Agricultural Technologies and Tropical Deforestation*. CABI, Wallingford, UK, pp. 35–52.

⁵⁴ Hosonuma, N, et al; 2012, "An assessment of deforestation and forest degradation drivers in developing countries". *Environmental Resources Letter*, Vol. 7, no. 4, pp. 1-12.

⁵⁵ Trollidalen, J.M. 1998. *International Environmental Conflict Resolution: The role of the United Nations*. WFED, UNITAR, NIDR

⁵⁶ Diamond, J. (2005) *Collapse: How societies choose to succeed or fail*. London: Penguin.

study and report presented similar linkage between resource degradation and conflict. This led the UN Secretary General, Ban Ki-Moon used to claim that Darfur as the world's first 'climate war'. The report writes:

“UNEP’s analysis found very strong link between desertification, land degradation and conflict in Darfur. Growth of Population and environmental related stress in Northern Darfur was exponential that shaped the conflicts conditions to be accelerated and sustained by tribal, political or ethnic differences, could be considered a terrible social fail example that can lead from ecological collapse. The region long-term peace will not be likely unless these underlying factors which are linked closely to environmental and livelihood issues are resolved.”⁵⁷

Arguments have been made that even water levels reduction in Lake Chad will increase regional conflict.⁵⁸ Further arguments for the imminence of 'water wars' are provided by Joyce Starr, who argues that 'water security soon will placed to military security level in the war rooms of defence ministries' while Barry argues that 'it is possible to think of water allocations along rivers like Nile issues, the Indus and the Mekong leading to use of military force'.⁵⁹ Indeed, in a matter that is directly relevant to this study, Boutros-Ghali, the then Egyptian Foreign Minister who later went on to serve as UN Secretary General, speaking of the conflicting demands to water rights by Nile basin countries, once observed that 'the next war in our region could be caused as a result of waters of the Nile and not politics'.⁶⁰ John Kerry the US Secretary of State also pointed out in February 2014 that: "In a sense, climate

⁵⁷UNEP (2007). *Sudan: Post conflict environmental assessment*, Nairobi: UNEP.

⁵⁸ Hall, E. (2009). 'Conflict for Resources : Water in the Lake Chad Basin', School of Advanced Military Studies, Fort Leavenworth , Kansas.

⁵⁹ Barry Buzan, *People, States and Fear: An Agenda for International Security Studies in the Post-Cold War Era*. Hertfordshire: Harvester Wheatsheaf, 1991.

⁶⁰ Gleick, Peter H. 1993. "Water and Conflict: Fresh Water Resources and International Security". 18: 79-112.

change need now to be well thought-out another weapon that can cause mass destruction, perhaps the world’s most terrifying weapon of mass destruction.”⁶¹

2.6 Land Degradation and Environmental Conflict: An Analysis

It is evident that there is connection between deforestation, land degradation and environmental conflict. The challenge will be an understanding on how impacts will occur, and then using that knowledge to develop adequate responses. The human angle in the land degradation and environmental conflict continuum may be summarized as follows:

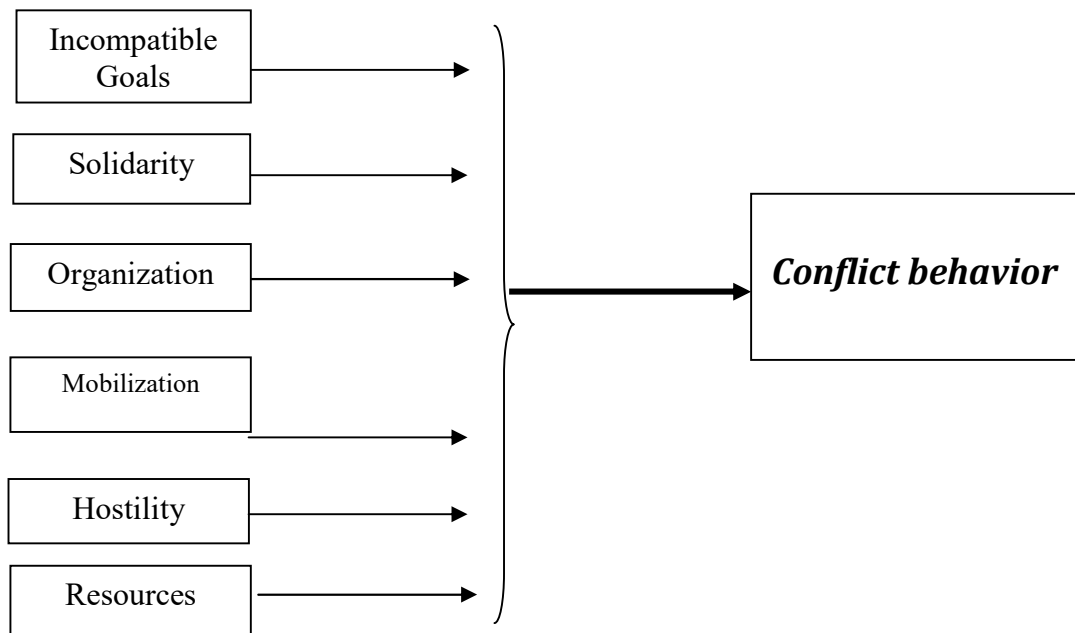


Figure 2.1: A Theory of Conflict Behavior

Source: Bartos, Otomar J. and Wehr, Paul (2002). *Using Conflict Theory*. Cambridge: Cambridge University Press. p 27.

2.6.1 Resource scarcity and conflict

⁶¹ US Secretary of State for Foreign Affairs, Remarks on Climate Change made in Jakarta, Indonesia on February 16, 2014. Available at <http://www.state.gov/secretary/remarks/2014/02/221704.htm>. Accessed on 2 June 2016.

It has been argued by scholars that the warfare driven of scarcity of resources, scramble for oil globally, minerals, natural gas and water are entering an era of warfare. Similar conflicts are expected to get worse where the fault lines coincide with deep-rooted religious, ethnic, or tribal cleavages. Other scholars admit that environmental or resource scarcity, were not adequate as a reason of violent conflict, but is likely more to be activated when accompanied by population growth density or major population displacements, thereafter will give increase to changes in resource or distribution access. An example, the 1991 Rwanda genocide has been attributed to among other factors, the scarcity of arable land, falling prices of agricultural production and poor institutional quality.⁶²

2.6.2 Resource capture and ecological marginalisation

Scholars have used the concepts of ‘resource capture’ and ‘ecological marginalisation’ to refer to, respectively, the political opportunities for control from elites arising from scarcity of resource and of people retreat from areas with resource-scarce into fragile ecosystems, thus creating added environmental challenges.⁶³ Other studies have noted that scarcity of resource indentify group identity conflicts, mostly amongst those who practice animal husbandry. It has been provided by some studies an overview of the Sahel and argued that economic marginalisation, vulnerability and political is a critical predictor on whether conflict will occur.⁶⁴

⁶² Val Percival & Thomas Homer-Dixon (1996). “Environmental Scarcity and Violent Conflict: The Case of Rwanda”. *Journal of Environment & Development*, Vol. 5, No. 3, September 1996 270-291. Princeton: Sage Publications.

⁶³ Homer-Dixon, T.F. (1999) *Environment, Scarcity, and Violence*. Princeton: Princeton University Press.

⁶⁴ Raleigh, C. (2010), ‘Political Marginalization, Climate Change, and Conflict in African Sahel States’, *International Studies Review* 12(1), 69-86.

2.6.3 Aggravating existing risks

The cumulative effect of land degradation and other resource-based conflicts also may be a ‘threat multiplier’. Scholars have posited that land degradation could be ‘the straw that will break the camel’s back’, especially concerning pastoral communities within East Africa. Others have also argued that environmental deterioration joined with other political, economic and social factors ‘tremendously increase’ conflict likelihood in the Horn of Africa. Conversely, land degradation will cause people in developing countries to migrate, and this can cause conflict in the receiving end. It was noted that this type of conflict happens in presence of resource competition, distrust, ethnic tension and socio-economic even in cultural fault lines. This model applies to general migration as well, which is accelerated by scarcity of resources. This is directly pertinent to the situation in the Mau area, since some communities could have been displaced due to efforts to rehabilitate the Forest, thus causing a lot of political posturing and realignment on both local and national levels.

2.6.4 Gender dimensions of environmental conflict

Specific social groups like children and women are vulnerable especially to resource-based conflicts because of cultural and social practices. Scholars have presented a gendered analysis of how environmental conflict impacts human security, and whether sufficient scope exists for women to contribute in to improving human security. Such emphasis on social categories may imply to certain solutions. Changes that drive conflict also increase women economic vulnerability. Mostly, labour gendered division in many countries lead women to suffer from direct and indirect threats caused by violent conflict. Not surprisingly, women are often the largely important actors in peace-building endeavours.

2.7 The major Drivers of Land Degradation, Deforestation and Environment Conflict in Africa and the Mau Forest Complex

2.7.1 The function of Technological Factors in Land Degradation and Environmental Conflict

Modern technologies often occasion decreased labour demand in agriculture, creating labour surplus within agricultural sector. Such labourers will look for jobs in urban areas, thus requiring more lands to feed the growing economy and population. Industrial development is generally seen as an engine for economic growth. In China, for example, rural industries are situated in areas where agriculture is better developed and are located close to urban centres.⁶⁵ Thus, the rural industries exerted considerably extra pressure on rural communities that convert land for agriculture to non-agricultural uses. A study done for regions surrounding Jakarta in Indonesia establish that industrial estates development was the major factors that leads to extensive agricultural land conversion, which includes deforestation.⁶⁶

Often, also, technological advancement goes step in steep with urbanization. Both urbanization processes and migration on rural–urban are major factors that manipulate agricultural land conversion. Researchers found an important positive correlation between farmland conversion and the growth of urban population. They finished that the industrialization process is often harmonized with farmland conversion and urbanization.⁶⁷ Thus both directly link, for example, enabling faster methods of forest exploitation and highly mechanized farming that often cause land degradation, even indirectly through urbanization and industrialization, technological change often contributes to environmental

⁶⁵ Lin, George C. S. and Samuel P. S. Ho. 2005. “The State, Land System, and Land Development Processes in Contemporary China,” *Annals of the Association of American Geographers*, 95, 411–436.

⁶⁶ Lin, George C. S. and Samuel P. S. Ho. 2005. “The State, Land System, and Land Development Processes in Contemporary China,” *Annals of the Association of American Geographers*, 95, 411–436.

⁶⁷ Ding, Chengri. 2004. “Urban Spatial Development in the Land Policy Reform Era: Evidence from Beijing,” *Urban Studies*, 41, 1889–1907.

conflict. However, it must be noted that technology is a double-edged sword that may mitigate the effects of land degradation and thus help alleviate the causes and the environmental conflicts severity.

2.7.2 The Role of Cultural Factors in Land Degradation and Environmental Conflict

Kenya is endowed with diverse land based natural resources, that contribute indirectly or directly to the socio-economic well-being of the people. These resources include: wildlife, forests, minerals, water, marine products, and the land itself. Other resources comprise biodiversity, palaeontology, archaeology, cultural heritage and native knowledge. However, rising demand for fuel, wood and food is putting unsustainable and unprecedented demand on the region's remaining forests, which can lead to environmental conflicts. Another cause of land degradation is the extractive proliferation actions such as logging and mining.⁶⁸

Shared ecosystems like lakes, river basins and forest ecosystems have implications for land rights. For example, the Mara–Serengeti ecosystem management raises the need for land use plans that cover Kenya and Tanzania together. Similarly, the Virunga Volcanoes comprising Parc National des Virunga in the DRC; Parc National des Volcans in Rwanda and Mgahinga Gorilla National Park in Uganda call for accommodating management arrangements for land. We have seen that Kenya's activities contributing to Lake Jipe in Tanzania drying up. Countries within the region have trans-boundary resources like River Nile Basin, which covers Burundi, DRC, Egypt, Ethiopia, Sudan, Kenya, Rwanda, Uganda and Tanzania. Lake Victoria, the largest lake in Africa, is shared among the three countries and those in the Nile Basin. Activities in one country, such as irrigation, can affect the resources in another country.

⁶⁸ UNEP (2007). *Sudan: Post conflict environmental assessment*, Nairobi: UNEP.

Degradation of land can be caused through fertility loss, top soils loss, forest cover loss, soil erosion, creeping, soil Stalinisation, creeping, and desertification, among others. The management of cultural land practises may directly contribute either to resource conservation or degradation, whichever the case may be. Poor management of land and population increase pressure on natural resources and land also has contributed to the degradation of land and desertification. Land is a primary asset for survival and development with important cultural and historical meanings. Land is source for livelihoods and carries spiritual values that can provoke very profound reactions.

Vague understanding of traditional land rights to access natural resources and land can also cause environmental conflicts. Kenya's land regime is categorized by access of legal pluralism, ownership, natural resources and land administration. Both modern tenure and customary co-exist side by side, and now we have the local (county) regime as well. Often, the practices of customary tenure are based on local practices and norms under management of councils of elders or local/traditional rulers who are flexible. The system dynamics of customary tenure nature have their diversity challenge to the processes of codification of norms.

2.7.3 Functions of Economic Factors in Land Degradation and Environmental Conflict

Economic growth depends on the primary commodities export and increased agricultural products demand where timber is identified as major deforestation and degradation indirect drivers in global economy across the tropics.⁶⁹ Remote sensing data done recently, combined with economic trends and population illustrates that export of products of agricultural to other

⁶⁹ Rademaekers, K., L. Eichler, J. Berg, M. Obersteiner, and P. Havlik. 2010. *Study on the evolution of some deforestation drivers and their potential impacts on the costs of an avoiding deforestation scheme*. Rotterdam, The Netherlands: European Commission Directorate-General for Environment.

countries and production of agricultural for domestic urban growth are indentified as primary drivers of tropical deforestation.⁷⁰ There is a connection between population growth and density with agricultural land increased demand, arrangements of land tenure, pressures on fuel wood, agro-technological change, and easier access to distant forests because of infrastructure development and increased of forest products demand. There is also growing pressure for big land tracts acquiring for commercial purpose. Recently a report was published on grabbing of land that disagreed with four myths over large-scale land deals: that new projects of land will hub on marginal areas; that projects will bring about food and energy security for the communities and countries providing the land; that projects create jobs and can do something to alleviate poverty, and; that the projects will bring in tax revenue. In Kenya, land has often been used like a political tool, and politicians acquire patronage and a mechanism using acquired land to hold people to the same political system or party.⁷¹

2.8 The function of Institutional Policies in Land Degradation and Environmental Conflict

Researchers have identified two distinct “state-centric” underlying pathways from scarcity of resources to conflict: the “state failure” and the “state exploitation” hypotheses. Both indicate that scarcity of resources may place severe pressure on society and state institutions. The state failure hypothesis suggestion on scarcity of resources will weaken state institutions and opportunities for potential rebels provide to defy state authority. The state exploitation

⁷⁰ Defries, RS, Rudel, T, Uriarte, M & Matthew, H 2010, ‘Deforestation driven by urban population growth and agricultural trade in the twenty-first century’, *Nature Geoscience*, vol.3, pp.178 – 181.

⁷¹ UNECA (UN Economic Commission for Africa) (2000) *Transboundary river/lake basin water development in Africa: Prospects problems and achievements*. Available at http://www.uneca.org/awich/Reports/Transboundary_v2.pdf (Accessed 20 March 2016)

hypothesis suggestion on scarcity of resources can weaken state to boost their support based on opportunity of mobilizing ethnic groups to capture scarce resources.⁷²

A major reason for modern existence of the state is the security of its citizens. States are crucial to providing chance for people, providing measures for protecting people when livelihoods contract and providing a steady environment so that livelihoods may be pursued with self-assurance. They may be promoted actively or repress personal security rights, social services even economic opportunities. They can use their sovereign rights to mediate among global flows in conduct that undermine or enhance entire or certain groups' livelihoods. Acknowledging that no violent conflicts which are entirely local and that most of them have important regional and global forces at work, where many states can be involved in the causes of solutions to violent conflict.⁷³

The state's role is important in creating and sustaining stability, peace and predictability. Where people have less concern about the future, the mechanisms of resolution of conflict inclined to be effective, and economies are expected to grow while poverty levels tend to fall. These are features of 'strong states' that have effective hierarchies of administrative, impending conflicts can be mediated before they turn to violent, control use of legitimate force and are capable of degradation of environmental management and change. The livelihood factors in tough liberal democratic states and its structural conditions decrease the violent conflict risk.⁷⁴ State functions that give the impression to be of particular importance to mitigate against the creation of violent conflicts consist of the provision of protection of human rights, education and health care, accountable and transparent police services and

⁷² Kahl, Colin H. (2006). *States, scarcity, and civil strife in the developing world*. Princeton, NJ: Princeton University Press.

⁷³ Reno, W. (2000). "Shadow states and the political economy of civil wars". In M. Berdal, & D. Malone (Eds.), *Greed and grievance: Economic agendas and civil wars* (pp. 43 -68). Boulder: Lynne Rienner.

⁷⁴ Sen, A. (1999). *Development as freedom*. New York: Anchor Books.

armed forces, establishment and maintenance of independent and strong judiciary and protection of democratic processes.⁷⁵

Due to above reasons, groups that live beyond state protection or fall outside of or for reasons of social and geographic distance, are often more probably to experience violent conflict. Indeed, much of violent conflicts in marginal regions ecologically and/or economically offer proof that relative poverty or inadequate access to the state due to opportunities of poverty which is major cause of violence.⁷⁶ Thus, where states deny its people actively deliberately represses or abuses them, violence become likely more tool of resistance.⁷⁷ This can be seen in Nigeria's River State in disputes due to proceeds from exploitation of oil resources distribution. The weapon availability, a history of violent conflict, resource dependence, a 'youth bulge' among the working people and immigration may be among the causes that increase risk of violet conflict.⁷⁸

Environmental politics is deeply impacted by the situation of the natural environment and major environmental incidents. In the US, it was noted that shifts in party control had key influences on the legislative achievement of the environmental movement. Also, political party support for presidential candidates may influence environmental policy by helping or hindering the mobilization of significant segment of the population. It is however the political and institutional responses to new migrants quite than the existence of migrants *per se* that seems to be most important in causing or exacerbating conflicts. Thus, governance and policy

⁷⁵ Kahl, Colin H. (2006). *States, scarcity, and civil strife in the developing world*. Princeton, NJ: Princeton University Press.

⁷⁶ Goodhand, J. (2003). "Enduring disorder and persistent poverty: a review of linkages between war and chronic poverty". *World Development*, 31, 629e646.

⁷⁷ Nafziger, E., & Auvinen, J. (2002). "Economic development, inequality, war, and State violence". *World Development*, 30, 153e163

⁷⁸ Boutwell, J., & Klare, M. (1999). *Light weapons and civil conflict*. Lanham: Rowman & Littlefield.

as instrumental state responses to challenges in its jurisdiction may directly impact the cause and course of any resultant environmental conflicts.⁷⁹

Poor governance in Kenya's land has a long history. The 2007 December and early 2008 post-election violence, translate proof of the deep-seated rivalries to land and natural resources access. These were preceded by many 'land clashes' that littered the Nyayo era between 1978 and 2002. Such conflicts will have important implications for economic and political stability in Kenya and for the whole of East Africa. Clashes due to pasture and water have considerably drought increase affecting north eastern area of Kenya in the past three years, as traditional conflict resolution mechanism fail to rein in warring communities. The land disputes within Kenya can be traced back to colonial era when massive land displacements were being done by the colonial government. It is hoped that the newly-minted National Land Policy (NLP) will help readdress these land and resource-related grievances. The NLP insist on the use of Alternative Disputes Resolution (ADR) mechanisms like mediation, negotiation, and arbitration to decrease the number of cases that result to court or criminal justice system.

The Land Policy Initiative defines land governance as "the political, process and structures administrative where decisions concerning land use and access to resources are made and implementing that include the manner in which general oversight on the land sector performance are managed". The aspects of good and weak land governance systems include consultation, participation, interactivity, inclusivity, consensus-based; timeliness, professionalism, transparent, gender sensitivity, innovativeness and cost effectiveness.⁸⁰

⁷⁹ Goldstone, J. (2001). Demography, environment, and security. In P. Diehl, & N. Gleditsch (Eds.), *Environmental conflict* (pp. 84e108). Boulder: Westview Press.

⁸⁰ FAO (2011). *Sustainable Land Management in Practice Guidelines and Best Practices for Sub-Saharan Africa*. Rome, 2011.

The Kenya forest regulatory framework has seen significant developments in the recent past, especially with the Constitution of Kenya, 2010 promulgation. The KFS is in charge of the pursuit of and compliance with international commitments and Kenya’s national land plans as guided by national strategies like the Kenya Vision 2030, Climate Change Strategy, the Semi-Arid and Arid Lands Policy, the Land Policy use and the Energy Policy.

Further research on how land degradation provides occasions of conflict are needed in order to present a more intense linkage to environmental. Below is a diagrammatic summation of the major factors in how land degradation affects environmental conflicts.

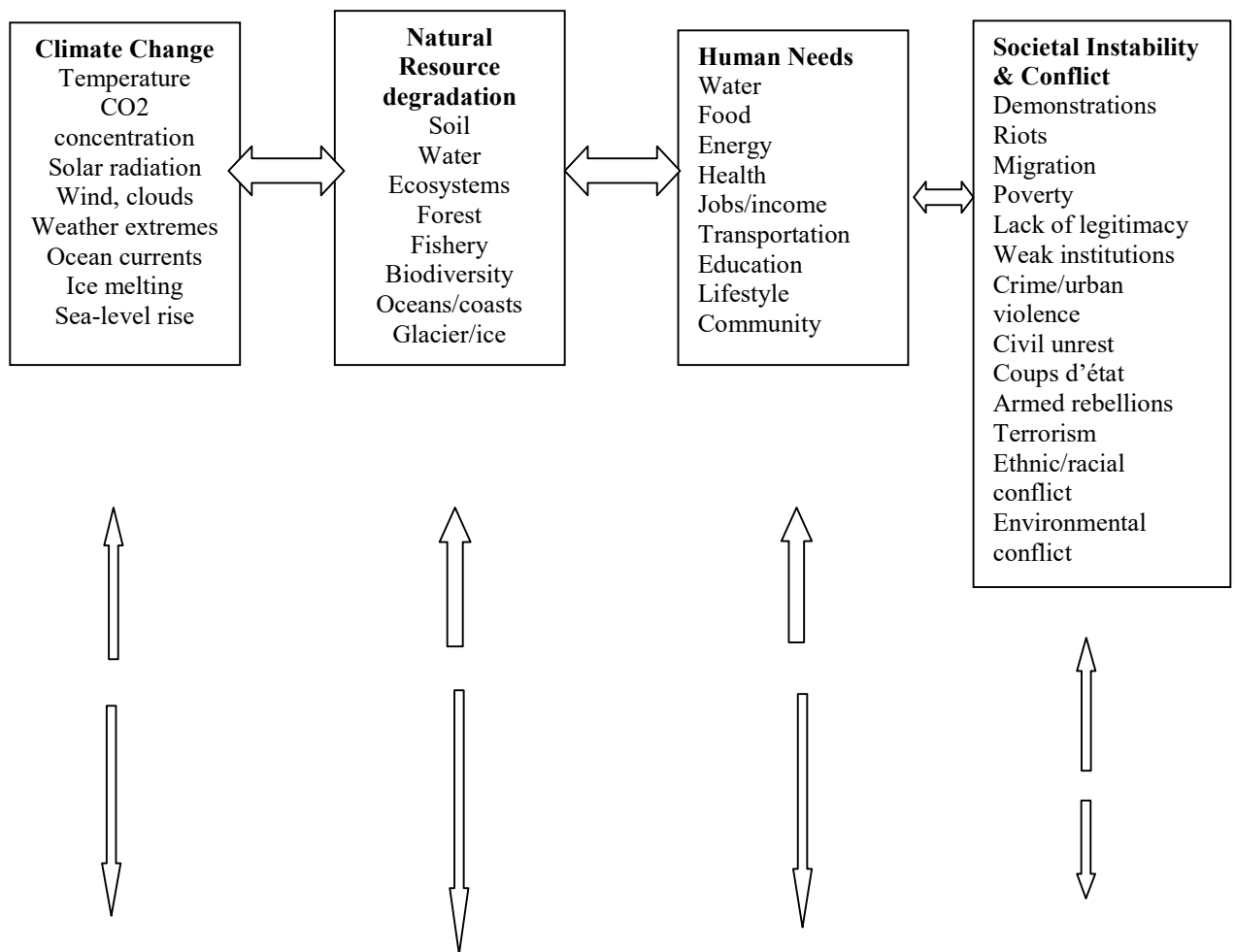


Fig 2.2: A linear causal relationship between resource degradation and conflict

Source: Tim Forsyth and Mareike Schomerus (2003) *Conflict: A Systematic evidence review*. The Justice and Security Research Programme (JSRP). JSRP Paper 8. September 2003.

2.9 Conclusion

This paper argues that human security will be undermined by land degradation and environmental conflict and will continue doing so in the future. It does this by reducing access of natural resources to people which are important to sustain their livelihoods. In addition, it is also likely to destabilize capacity of state to provide opportunities and services that assist to sustain people's livelihoods and help to sustain and build peace. In some circumstances, these can boost the conflict risk. The paper also argues that as the primary guarantor of effective management of forest and enforcement of related Kenya's laws, the KFS is called over an augment of its capacity to discharge this role. This calls for greater capacity is not resolution of conflict and management expertise on the part of KFS, something which has not traditionally been its domain. This study attempts to cover that ground, particularly in relation to the MFC in Kenya.

Yet, beyond this research, there is need therefore for significantly more research on ways human security may be undermine, at least because the people's level of vulnerability understanding is still adequately uncertain for the purposes of designing effective version strategies. This calls for richer approaches that consider cultural and social perspectives, which may often contribute to conflict or determine how the people react to perceived threats.

CHAPTER THREE

MANAGEMENT OF LAND DEGRADATION AND ENVIRONMENTAL CONFLICTS

3.1 Introduction

This Chapter discusses the environmental conflict aspect of land degradation. It explores the link in between land degradation, scarcity of resources and conflict, including through some theoretical perspectives. It also explores some established management of conflict and resolution approaches that are applicable to the decision of environmental conflicts. These are anchored both in international instruments and domestic law, namely the Kenya Constitution, 2010. The perspectives offered in this chapter will assist the study evaluate, based on actual findings, which are useful methods in the MFC, what works, and what measures may be made in terms of recommendations.

3.2 The Concept and Nature of Environmental Conflict

Conflict is a notion that assumes a different definition. It can be conceived of as cultural behaviour helping to explain disputes over seemingly similar substantive issues which may be handled so dissimilarly indifferent among citizens.⁸¹ Conflict occurs when incompatible deeds occur that prevents, obstructs, interferes or injuries are caused to other groups. Thus, the necessity of sharing, acquiring, maintaining or preserving human or natural resources is a necessary cause of environmental conflict.⁸²

In the modern world, conflict has unfocused from being fought by blocks/groups of nations or nation against ideas, to conflict within civil groups like ethnic groups, sectors and nation

⁸¹ Sears, A. (2008). *A Good Book, In Theory: A Guide to Theoretical Thinking*. New York: Higher Education University.

⁸² Deutsh, M. *Conflict and its resolution in Africa*. USA: McGraw Hill, (1986). P. 201.

boundaries. Those conflicts are linked to social and economic issues. Many researchers have noted association between conflict's risk and environmental change. According to bargaining school of conflict, resource-based conflicts are defined as a reflecting process of values and needs of effective decision in resources sharing when being processed. If there is ineffective sharing formula of the resources, it leads to turbulent conflicts.⁸³

Conflicts can be placed in category of whether they happen at the micro–macro or micro–micro levels, i.e. between groups in community or among community groups and outside government or civil society or private organisations.⁸⁴ Micro–micro conflicts is where they occur either directly within the group involved in a specific regime of management of resources (e.g. ecotourism association or user group of forest), or between those indirectly involved and those group (e.g. women collecting fire wood in forest and between the user group).⁸⁵ The short-term conflicts impact can be either a reduction temporary in the effectiveness of regimes management of the resources, to the entire initiatives collapse or abandonment of government, NGO or donor-sponsored projects. On the other side conflicts against natural resources can escalate into physical or even organised, large scale violence, as it was witnessed in Nigeria's Niger Delta.

After reviewing several definitions of conflict, scholars argued that definitions overlap even though they are not identical due to some elements as following: 1) Conflict includes the *opposing interests* which is between a zero-sum situation or individuals groups; 2) The *recognized* for opposed interest must be identified for the conflict to subsist; 3) Conflict can involve *beliefs*, from any side, that the other will foil (or has already foiled) its interests; 4)

⁸³ Sheriff G.I. "Global terrorism: An African perspective" in *Journal of Political Studies*. Abuja: Family Communication Press. 2004. Vol. 1 No. 1 p. 231.

⁸⁴ Grimble, R. and Wellard, K. (1997) 'stakeholder methodologies in natural resource management: A review of principles, contexts, experience and opportunities'. *Agricultural Systems* 55, pp.173–193.

⁸⁵ Conroy, C. Rai, A., Singh, N. and Chan, M. K. (1998) 'conflicts affecting participatory forest management: Some experiences from Orissa'. Revised version of a paper presented at the Workshop on Participatory Natural Resource Management in Developing Countries: Mansfield College, Oxford, 6–7th April, 1998).

Conflict is a *process*; where it can develop out of existing relationships between groups or individuals and reflects their past interactions and the contexts in which they took place; and 5) *Actions* by either party does, actuary, produce thwarting of others' goals.⁸⁶

The conflict representation can be described in the following subsequent categories: 1) *Individuals and Societal Tensions*: The tensions are formed whenever a group or an individual feels that he/she/it has not received what was due or has been wronged. These kind of tensions, can also occur due to inequalities in historical socio-economic. Deprived governance is a major cause of strain between individuals and the society. 2) *Latent Conflict*: The tensions can cause a emotion of injustice and may give increase to simmering dissatisfaction. Often, tensions could manifest themselves in the form of needs to authorities, etc. Management and Governance feel that is best opportunity time for managing a conflict or rather preventing a conflict. 3) *Escalation of Tensions*: Unattended grievances, overlooked concerns and neglected tensions by the relevant authorities like in the case the KFS lead to further annoyance of the discontent. The opposing parties stand begins to harden. In this phase, half-hearted attempts may prove to be of little help. The feeling of involved parties begin to express it through more violent methods like strikes, demonstrations, processions etc. 4) *Eruption*: filer to manage tensions properly it can guide to a state where a small 'spark' can leads to violence eruption. The 'spark' or activate can by itself not be a main event, but it can cause additional polarisation of the people concerned and becomes a justification for the violent eruption. Generally the relevant authorities move into action at this stage and try to manage the violence. It has been argued that even though violence has been contained, sufficient efforts are often not made to lecture to the origin of the conflict. 5)

⁸⁶ Baron, R. A., & Greenberg, J. (1990). *Behavior in organizations: Understanding and managing the human side of work* (3rd ed.). Needham Heights, MA: Allyn & Bacon.p. 199.

Stalemate: This state is like the ‘latent tension’ and has the possibility for outbreak of violence at ordinary intervals.

It is required to be emphasised that in at every stage, there would be governance issues involved. Where governmental interventions lack or handling of the situation would seem to push the emergent circumstances to the next level of conflict therefore, appropriate and timely measures mainly would lead to decision of the situation of conflict. On reaching a stalemate situation, the conflict may go into a cyclic phase, causing repeated escalations and eruptions. A more compound and multi-pronged move is necessary to save the situation, including taking negotiations and settlement route that would result in de-escalation of tensions and initiation of post-conflict confidence peace building process. This study posits that such a nuanced approach may be required to determine the intractable challenges of the MFC.

The World Bank research suggests that the largely dependent wealth countries on primary exports of commodities like natural resources and agricultural produce are highly prone to civil violence. The connection of natural resources, war onset and length could be explained at least six families rival mechanism as follows⁸⁷:

The greedy rebels mechanism. In this conceptualisation, engagement of quasi criminal activities by domestic groups can benefit them from independent resource from the state, which can lead to the local expulsion of the state similar to Colombia case and parts of Mexico and Afghanistan. Ultimately, this may progress to state capture.

The greedy outsiders mechanism. Apart from consequential from the rebels who are greed, natural resources existence can be an inducement for third parties states and engage in

⁸⁷ Collier, Paul and Anke Hoeffler (2000b). “Economic causes of civil conflict and their implications for policy. In Chester A. Crocker, et al (eds.). *Managing global chaos*. Washington, DC: United States Institute of Peace.

corporations to or indeed foster civil conflicts. An example, the Democratic Republic of Congo's escalation of the civil war has contributed in part from the participation of neighbouring nations in the fight for valuable raw materials. The Katanga in Congo secessionist bid was supported by the Belgian firm Union Minière du Haut Katanga if not instigated. Evidence suggests that conflict escalation in the Republic of Congo was because of French oil corporation Elf action.⁸⁸

Under *the grievance mechanism*, natural resource depends and results to conflicts that are linked to grievances instead of greed. First, middling levels countries that dependence on natural resources can experience fleet of inequality as part of the development process. Second, natural resources dependant on economies states can be highly at risk in terms of trade shocks, causing dissatisfaction and instability inside groups that suffer from the shocks. Third, product of grievances may cause extractions process like forced migration; an example is the Aceh and Papua New Guinea externalities extraction process or unjustly distributed wealth other than natural resource the way it has been claimed in Nigeria and Sierra Leone.

In *the feasibility mechanism*, rebellions can look for a way of being financed by natural resources that have been underway for other reasons, thus increasing the prospects of success. This can occur moreover through control of production during conflict. But in *the weak states mechanism*, natural-resource economic dependent can be caused by weaker state structures. One variant of this argument focuses on the weak society-state's weak side relations and holds that the government which have fewer powers to untaxed citizens, who can retain less information over government activity, weaker monitoring incentives to government behaviour and fewer instruments at their side to withdraw governments support. Otherwise, the states that depend on resource can have little compulsion to react to their citizen demands or make structures that engage them. The second channel looks on the relation of state-

⁸⁸ Verschave, François-Xavier. 2000. *Noir Silence*. Paris: Éditions des Arènes.

society, arguing that governments may weaken its indicative when they rely on natural resources instead of taxation to create strong bureaucratic institutions. Under the *sparse networks mechanism*, natural resources importance can lie in their impacts on the economic activities of the citizens daily and how these attitudes affect citizens or relations among them. Natural-resource-dependent economies states can have manufacturing sectors which are weak.⁸⁹

From the foregoing, one can argue that environmental conflict most commonly manifests within state borders. However, where main natural resources like fresh water are shared, like in the Nile basin, such conflict may also involve several states.

3.3 The function of the KFS in Preventing Land Degradation and Environmental Conflict in Kenya

For the last ten years, Kenya's forest sector has skilled poor performance in the past and forest governance improvement has been an understood objective reform in forest sector. The KFS is mandated to perform several key functions, including: Policies formulation and guidelines concerning the conservation, management and utilization of entire country's forest areas; management of entire state forests; management of entire provisional forests through consultation with the owners of forest; Kenya forest protection in accordance to the provisions of the Act; capacity building promotion of management of forest; collaborating with individuals, public and private research institutions through guidance for research needs and research application findings; extension services be provided to forest owners, farmers and Associations in the forest sustainable management; while for the forest use in recreational and ritual; water catchment areas management mainly for purposes of

⁸⁹ See especially Collier, Paul and Anke Hoeffler (2000b). "Economic causes of civil conflict and their implications for policy. In Chester A. Crocker, et al (eds.). *Managing global chaos*. Washington, DC: United States Institute of Peace.

conservation of water and soil, sequestration of carbon and other environmental services, regulations pertaining to logging enforcement, charcoal making together with other forest utilization activities; development of programmes and facilities in partnership with other tourism interested parties, and; promotion of national welfare in relation to international forest-related conventions and principles.⁹⁰

Among the key guiding frameworks for the KFS is the Forests Act of 2015. It introduced local engagement to communities, and sectors of private investment promotion in gazetted forest reserves, participatory of forest management, concomitant institutional and organization change, notably the establishment of the KFS and the Community Forest Associations (CFA) formation. The National Forest Policy of 2014 was meant to offer an updated framework compliant with aim of development of National agenda and the Kenya Constitution of 2010. The policy had set responding measures and actions broadly to the challenges faced by entire forest sector. The Constitution, Inter-governmental Relations Act, national land policy, 2012, Transition to Devolved Government Act, 2012, Land Act, 2012 even the National Climate Change Response Strategy entirely address issues which underscores forestry's unique role mainly climate change adaptation and mitigation.

In fact, the KFS is responsible of the conservation, governance, management and forest-related laws enforcement, rules and regulations. Forest governance means the process of articulation, formulation, administration, and implementation of policies, regulations, guidelines, legislation and norms recounting to ownership, control, right, access, responsibilities and practices for forests sustainable management at local or national levels. This is placed on the major principles guidelines of forest good governance including justice and equity; empowerment; transparency; accountability; subsidiary, and; sustainability. Actually, law enforcement of forest refers to various undertaken measures to make sure the

⁹⁰ Kenya Forests Act, 2005.

formal rules and regulations are in compliance to promote forest sustainable management. The measures may include detection, prevention and suppression.

3.4 Kenya Forest Service Strategies in the Mau Forest Complex

Passage of the Kenya Forests Act, 2005

The passage of this key legislation was the culmination of a long period of advocacy by major forestry stakeholders and environmental conservation sector in Kenya. The Act mainstreams conservation of forest and national land systems management usage and delineates a clear responsibilities division among public sector and the regulatory role of the sector, thus allowing KFS to focus on forest management on the public land. It also deepens participation of community forest management through encouragement of Community Forestry Associations (CFA), and the benefit-sharing arrangements introduction, where both have important use of resource and conflict management applications as borne out in literature. The adaptation of approaches of ecosystem for the forest management in addition, had recognises users right and customary rights to support sustainable forest management in its conservation in the way of instituting key plans in combating the cultural and economic drivers in degradation of land and environmental conflict, especially in the MFC. Further, by introducing a chain-of-custody system for wood and timber products, legal origin and compliance certificates for exporters of wood and timber products, the Act has provided great impetus against illegal forest exploitation activities that have been the bane of the Mau ever since Kenya's independence in 1964.

Establishment of the Task Force for the Mau Forest Complex

This taskforce was created by the Grand Coalition Government (2008-2013) and was domiciled in then the office of the Kenya's Prime Minister, with the primary mandate of

recommending strategies for restoring the MFC in line with Vision 2030 for Kenya. The taskforce spearheaded several conservation initiatives, like eviction of illegal squatters on forest land and to restoration of forest cover through diverse re-a forestation programmes.

Development of institutional frameworks and strategic Management Plan

Under the framework of the Task Force for the Mau Forest Complex (TF-MFC), Mau Forests Complex Authority (MFCA) was to oversee its management and find its management. The representation of board of directors include the major stakeholders, economic sectors directly dependent of both goods and services of the MFC such as energy, water, tourism, wildlife, forestry and agriculture had authority to guide. Other initiatives under the taskforce included boundary surveys, issuing of title deeds, monitoring, enforcement relocation, resettlement, support of livelihood and development.

Multi-stakeholder approach to Mau Forest Complex conservation

The KFS has adopted a comprehensive approach to conservation and the management of the MFC.⁹¹ Thus, it has worked with diverse environmental scholars and concerns, including local forest associations, even international bodies, especially the UNEP, through its Division of Early Warning and Assessment (DEWA).

Public awareness and community sensitization

The KFS has actively sought and cultivated awareness to public and community participation programs for the indigenous communities residing near the forest. Sustainable livelihood options were also explored and natural resource-based income generating activities inside and within the forest. This has included partnership provision with institutional nurseries of seedlings and other private and international organizations.

⁹¹ The Kenya Forest Act (2005).

3.5 Land Degradation and Environmental Conflict: Some Theoretical Perspectives

None of accepted universally or formulation consistent of the driving forces of environmental change. However, some of perspectives on the major driving forces have been developed by scholars. Even though different theoretical models have been developed, some of those have developed into a substantive literature are Neo-Malthusian Models and Ecological Modernization Theory (EMT), Political Economy/World Systems Theory and Lateral Pressure Theory (LPT). The entire models define different approaches to the solution of environmental problems and have significant political impacts. This paper discusses over the main two theoretical frameworks that directly relate to land degradation and environmental conflict: These are the Ecological Modernization and Lateral Pressure Theories.

3.5.1 Ecological Modernization Theory

The basic hypothesis of Ecological Modernization Theory is the ecological interests of centripetal movement, ideas, and social practices and institutional developments. This results in ecology-inspired, process of environment-induced of transformation, main practices for reform and central institutions of modern society. These process within Ecological Modernization Theory have been conceptualized at the level of analytical since the growing autonomy or independence of an ecological viewpoint and ecological rationality vis-à-vis other perspectives and rationalities.⁹²

Different scholars of ecological modernization have explained the dynamics, social mechanisms, and during process of development of institutional at national level and social practices taken up by environmental welfare and considerations. Mostly concentration has been concentrated to technological change, market dynamic and economic actors, political

⁹² Mol, Arthur P. J. 1995. *The Refinement of Production: Ecological Modernisation Theory and the Chemical Industry*. Utrecht: Jan van Arkel/ International Books.

modernization, and new forms of governance, strategies and ideologies of social movements.⁹³

This theoretical approach checks on the function of development in technological, economic expansion, environmental governance growth in creating and mitigating environmental problems. In this viewpoint, technology shift and economic development cause the initial generation of environmental problems. However, economic development further can also mitigate these problems. Whereas technological advancement may be concomitant with urbanisation and also spawn destructive technologies such as automated mills, the modernization process leads to the development of higher technologies and a shift from production of highly polluting to less polluting production methods. This process follow the form of an Environmental Kuznets Curve (EKC), i.e. levels of degradation of environment trail an inverted U curve, in which at a sure point of development, degradation of environmental would stop increasing and start decreasing. Thus economic growth perspective can result in a complete decline in levels of environmental pollution.

Various scholars concluded that the end of the global capitalist economic order may be caused by globalization since it jeopardizes the nourishment base of consumption and production.⁹⁴ They have combined the global aggressive idea in capitalist economy expansion with the on-going and intensifying formulate to (global) crisis on environmental “second contradiction of capitalism” argument. They think that economic expansion and growth that are intrinsic within the global capitalist economy will rotate the tide of the global capitalist economic order and it changes it beyond recognition, run up against boundaries of environmental that will, in the end, rotate the tide of the global capitalist economic order and

⁹³ Andersen, Mikael S., and Ilmo Massa. 2000. “Ecological Modernisation—Origins, Dilemmas and Future Directions”. *Journal of Environmental Policy and Planning* 2 (4): 337–345.

⁹⁴ Schnaiberg, Allan, Adam Weinberg, and David Pellow. 2002. “The Treadmill of Production and the Environmental State”. In *The Environmental State Under Pressure*, edited by A. P. J. Mol and F. H. Buttel, 15–32. London: JAI/Elsevier.

change it beyond recognition.⁹⁵ Other notable scholars have a similar conclusion on the impending environmental.⁹⁶

The Ecological Modernization Theory offers useful perspectives that may help to conceptualise and understand the drivers of land degradation in the MFC and their potential for conflict. It points two ways where technology, which is otherwise destructive to environment, and on the other time be utilized to mitigate the effects of degradation of environmental arising from change in climate and human interventions.

3.5.2 Lateral Pressure Theory

Lateral pressure refers to 'the extension of a country's behaviour and interests outside its territorial boundaries (and in some circumstances, the expansion of the boundaries themselves).⁹⁷ Several elements drive this expansionism and growing population will create an increasing demand for resources. Advances combination in technology, the rising demand puts pressure on domestic resources. Lateral pressure within a state makes it probably to expand to where it's territorial or economic aspirations crash with those of other pressured states, with militarization of international conflict as the result.⁹⁸ The states which mostly are prone to conflict are those with high technology, high populations and inadequate resources. Thus far, the authors have applied the model to six major powers from 1870 to 1914 and to Japan over the longer period 1878 to 1987, although they also claim broader applicability.⁹⁹

Lateral pressure theory generally supports the Malthusian claim that conflict and rivalry within the international system guided partly by expansion, growth in domestic and

⁹⁵ O'Connor, James. 1998. *Natural Causes. Essays in Ecological Marxism*. New York and London: Guilford.

⁹⁶ Hobsbawm, Eric. 1994. *Age of Extremes: The Short Twentieth Century, 1914–1991*. London: Michael Joseph.

⁹⁷ Choucri, Nazli & Robert North, 1975. *Nations in Conflict*. San Francisco, CA: Freeman.

⁹⁸ Choucri, Nazli & Robert North, 1989. "Lateral Pressure in International Relations: Concept and Theory", in Manus Midlarsky, ed., *Handbook of War Studies*. Boston, MA: Unwin Hyman (289-326).

⁹⁹ Choucri, Nazli; Robert North & Susumu Yamakage, 1992. *The Challenge of Japan Before World War II and After*. London: Routledge.

subsequent contest for market and resources. Even if the theory does not preclude resolutions which are peaceful to resources in interstate competition, it attest that necessary goods may be acquired by countries outside their own borders, to meet resources growing demands, which can be a basis of conflict and war.

Richard Ullman argued that important national security in purely military terms make states to ignore other more harmful dangers, thus reducing their entirety security. Among the possible dangers, he mentioned interruptions in the flow of importantly needed resources, a drastic worsening of environmental quality due to sources outside or inside a state, and domestic urban conflict possibly due to "the presence of big numbers of poor immigrants from poor nations."¹⁰⁰

Richard Ullman argue that "due to growth of more extreme as demand for some vital commodities increases and supplies appear more unsafe it was likely to cause conflict over resources" He espoused a firewood based narrative edition of the degradation:

"As more forest is cut down by third world villagers in search for fuel wood, the denuded land left behind is exposed to erosion. Rain carries away topsoil, making the land unsuitable for cultivation. The topsoil therefore silts up streams in its path. Meanwhile, due to fuel-shortage, villagers will replace dung (which they would have otherwise used for fertilizer) for the wood which can no longer available, robbing further soil the nutrients and bringing on agricultural failure. Unable to sustain themselves on the land, many would be forced to migrate worldwide to cities from the countryside."¹⁰¹

Referencing the Nile conflict-eliciting power dynamics, it has been hypothesised that in case a war was to be spark due to any renewable resource, it would be over fresh water. Similarly,

¹⁰⁰ Richard Ullman (1983). "Redefining Security." *Journal of International Security* 8(1):129-153.

¹⁰¹ Richard Ullman (1983). "Redefining Security." *Journal of International Security* 8(1):129-153.

non-renewable resources have been touted as more expose to violent behaviour between states, because they are 'lootable' and may be quickly utilized to build and fuel the military. Thus, it has been claimed that oil access could be a genuine root of war between nations, especially in resource-rich areas like the Caspian Sea, Persian Gulf and South China Sea. Further arguments for the resource-conflict relationship have exhaustively been discussed elsewhere.¹⁰² Territorial conflicts over 'spheres of influence' in resource-rich Africa played a significant role in the continents eventual colonisation and in World War I.

Most importantly for this study, it has also argued that violent conflict due to resource depletion and climate change can be more common at the level of intrastate rather than the interstate one. Thus, unresolved environmental issues like loss of forest cover, destruction of water towers and water resources loss may cause conflict. Perhaps in natural resources sensitivities recognition and their potential for conflict, the collection of United Nations Treaty for the periods between 1920 and 1944 then 1946 to 2010 reports over 1,128 treaties in regard to environment. Resource scarcity and degradation of environment are thus often at the root of both intra-state and inter-state conflicts.

The perspectives offered by the lateral pressure theory will be useful in helping the study identify the nascent causes of conflict. These which have been identified include the resource depletion and climate change, forest cover loss, destruction of water towers and water resources loss. Problem identification is always the vital first step towards procuring an effective and lasting solution. Thus, the theory will be useful in helping the study come up with relevant and workable recommendations on better management of environment and resources to prevent conflict.

¹⁰² Collier, Paul, and Anke Hoeffler (2004). "Greed and Grievance in civil war", in: *Oxford Economic Papers*, 56, 4, 563–595.

3.6 Conflict Resolution and Transformation Approaches

Environmental conflict Resolution (ECR) today has many labels, including collaboration, building consensus, collaborative learning, planning, natural resource management and community-based conservation. Environmental conflict Resolution term may be explained as a practice area within the broader with conflict resolution field that addresses controversies linked to the use, contentious disputes, natural resources management, growth, development, individual as well as community health, and a variety of related concerns.¹⁰³

Environmental conflict Resolution is combined solving of problems that brings party of interest together that encompasses: Face-to-face discussions, intended deliberation to enhance participants' joint education and understanding, manifold sectors representing varied inclusion and often perspectives of conflict, flexibility and openness of process, compromise or some other variation instead of unilateral decision making as the basis for agreements, and a strong environmental element that takes consider the interrelated biophysical, political, economic, and social systems.

Disputes of Environmental can be marked as *upstream*, *midstream*, or *downstream*. Upstream environmental conflicts entail policymaking or planning. Example, they may involve creating and implementing governmental policy on the environment, natural resources, health, or safety at the national, regional, state, or local level. Midstream environmental conflicts entail administrative permitting, such as granting or continuing environmental permits or exemptions. Downstream environmental conflicts deal with compliance and enforcement, and thus can involve people's ways of use of land, allocating or distributing natural resources, and sifting industrial and any other large facilities. Downstream conflicts can also entail the prevention, clean-up and penalty of air, water, or soil pollution.

¹⁰³ Rosemary O'Leary, et al. *Environmental conflict resolution strategies*. The Maxwell School of Syracuse University/The William and Flora Hewlett Foundation, p.10

In addition, environmental conflicts also differ in their scope as compared to classes of natural resources, locations, or situations. Generally and prospectively issues are addressed by policy-level disputes, while disputes of site-specific may use meticulous media (water, air or land) in convinced locations. A dispute of policy-level more often than not is upstream phenomenon, while a site-specific conflict is often downstream.

Environmental conflict Resolution processes originate from the philosophy of the Appropriate Dispute Resolution (ADR) or alternative movement, which stands in contrast to adversarial, traditional methods for resolving conflict, particularly litigation. For traditional litigation, is where a case is decided by judge or jury, in Environmental conflict Resolution where people use different forms of problem solving collaboration to reach a jointly satisfactory agreement on their own terms? Given recurrent failures in the administrative and legislative arenas and the drawbacks of litigation, it is significant to have a feasible alternative to traditional modes of dispute resolution of environment and policymaking. Resolution is non-coercive and non-power based thus enabling it achieve shared contentment needs without relying on either of parties' power. It ascertaining the origin of the conflict by digging dipper among the parties aiming at a post-conflict link that in not founded on power. Thus, this result is lasting, due to non-coercive, jointly satisfying, addresses the origin of the conflict with zero-sum because gain by one party does not mean loss by the other and party's needs are fulfilled. Need's of that kind cannot be bargained or fulfilled through coercion and power. These advantages make resolution for settlement potentially superior to settlement. Conflict resolution mechanisms comprise negotiation, mediation in the process of political and problem solving facilitation.¹⁰⁴

¹⁰⁴ Mwangiru, M., (2006). *Conflict in Africa; Theory, Processes and Institutions of Management*. Centre for Conflict Research, Nairobi. p. 42.

Article 33 of the UN Charter, outlines the mechanism of conflict management that it can be resolved through enquiry, negotiation, mediation, arbitration, conciliation, judicial settlement and resorting to regional agencies or arrangements or other people's own peaceful means of choice.¹⁰⁵ The national legal systems are usually based on Constitutions, policy statements and legislation which may include judicial and regulatory frameworks. This approach, majority uses the arbitration and adjudication processes to settle the arising conflicts.

3.7 Conflict Resolution Provisions in the Constitution of Kenya, 2010

The 2010 Constitution of Kenya has provisions that relates to natural resources and environmental management. Indeed, The Constitution directs how the natural resources within the Kenya's territory are to be managed. The State is in charged for the commitment to make sure sustainable utilization, management and preservation of the natural resources and environment also make sure the equitable sharing of the accruing payback; work to attain and sustain ten per cent at least of the land area with tree cover of Kenya; public participation encouragement in the protection, conservation and management of the environment; biological diversity and genetic resources protection; systems of environmental audit establishment, impact, assessment and monitoring of the environment; eliminate activities and processes that are probable to endanger the environment; and natural resources and environment utilization for the benefit of the people of Kenya.¹⁰⁶

One of the land's policy Principles as provided for under the Constitution is communities be encouraged to resolve land disputes using local community initiatives known in consistent with this Constitution. National Land Commission Act, the National Land Commission under this Constitution are even mandated to commence investigations, on its own ideas or a

¹⁰⁵ United Nations, *Charter of the United Nations*, 24 October 1945, 1 UNTS XVI, Available at: <http://www.refworld.org/docid/3ae6b3930.html>. Accessed on 1 June 2016.

¹⁰⁶ Article 69(1). See also the various laws covering forests, wildlife, water, land, minerals (Land Act 2012, National Land Commission Act 2012, Water Act 2002, Forest Act 2005, Wildlife (Conservation and Management) Act 2013, Mining Act Cap 306, etc.

complaint, into present or historical land injustices thereafter recommend suitable redress; and encouragement of application of traditional dispute resolution mechanisms in land conflicts.¹⁰⁷ The Constitution allows court's protection to healthy and right to clean environment by allowing persons to use a court of law for redress among other lawful remedies that are available concerning to the same matter.¹⁰⁸

Most importantly for this study, the Kenya's Constitution of 2010 provides for ADR form as one of the principles that will guide the tribunals and courts in the use of judicial authority.¹⁰⁹

The formal recognition of customary dispute resolution mechanisms and ADR is predicated on the cardinal doctrine to make sure that every person has access to justice; disputes are resolved expeditiously and without excessive regard to technical hurdles. Also, it is based on acknowledgment of the cultural diversity of the nation as foundational of the Kenyan nation, in that way helping address important cultural factors that drive or influence both degradation of land and environmental conflict the way it was discussed in Chapter Two. This marks an important step towards promoting public participation by communities in management of conflict. Further, Article 189(4) therefore provides for county and national governments cooperation. Government is required at each national or county level to collaborate in the performance of functions and exercise of powers, may set up joint committees and authorities. The national legislation is mandated to give procedures for settling dispute resolution mechanisms of intergovernmental through alternative like negotiation, mediation and arbitration.¹¹⁰ In this way, the Kenya's Constitution of 2010 offers solution of realising environmental justice which is entirely fair treatment and meaningful involvement of entire people.

¹⁰⁷ Article 67(2); See also the *National Land Commission Act*, No. 5 of 2012.

¹⁰⁸ Article 70(1).

¹⁰⁹ Article 159(2) (c).

¹¹⁰ Article 189(4). See also the *Intergovernmental Relations Act*, No. 2 of 2012; Also noteworthy, is sec. 32(1) which states that any agreement between the national government and a county government or amongst county governments must include a dispute resolution mechanism that is appropriate to the nature of the agreement; and provide for an alternative dispute resolution mechanism with judicial proceedings as the last resort.

3.8 Judicial Mechanisms of Environmental Conflict Resolution

Most nations and National governments constitutions, establish institutions with extra justifiable manner with objectives of settling disputes, collectively called the Judiciary. However, formal dispute settlement in the courts has been criticized as one that cannot guarantee justice administration fairly because of some factors. The geographical location, high court fees, complexity of rules, regulations, procedure as well as use of legalese.¹¹¹ Thus, for parties to get justice through litigation in conflict management it can take years. In fact, litigation is not a solving problems process but it is a winning arguments process.¹¹² However, the court process is useful where an expeditious injunction remedy form is required.

The Kenyan land and Environment Court is also granted power to hear and decide applications for redress of a violation, denial or threat to, or infringement of, or rights or fundamental freedoms regarding to a healthy and clean environment.¹¹³ Again, the Court has power to adopt and implement any other appropriate means of ADR not limited to conciliation, mediation and customary dispute resolution mechanisms.¹¹⁴ Indeed, the Court must stay proceedings until such condition are fulfilled where ADR mechanism is a condition precedent proceeding in the court.

3.9 Alternative Dispute Resolution and Informal Methods of Environmental Conflict Resolution

3.9.1 The Alternative Dispute Resolution Mechanisms Approach

¹¹¹ 65*Strengthening Judicial Reform in Kenya: Public Perceptions and Proposals on the Judiciary in the new Constitution*, ICJ Kenya, Vol. III, May, 2002.

¹¹² See Patricia Kameri Mbote et al., *Kenya: Justice Sector and the Rule of Law*, Discussion Paper, A review by AfriMAP and the Open Society Initiative for Eastern Africa, March 2011, Available at <http://www.opensocietyfoundations.org/sites/default/files/kenya-justice-law-discussion-2011> Accessed on 27th May, 2016.

¹¹³ Articles 42, 69 and 70 of the Constitution of Kenya, 2010.

¹¹⁴ Article 159(2) (c) of the Constitution.

The mechanisms of ADR is a phrase used to refer to entire process of decision-making instead of litigation including but not limited to enquiry, negotiation, conciliation, mediation, expert determination and arbitration. A wide variety of natural resource conflict and disputes are solved through ADR mechanisms. It must be noted, however, that these techniques are not exclusive mutually in any particular conflict, but can be used successively or in a modified mixture with other adjudicative methods for managing disputes.¹¹⁵

3.9.2 Negotiation and Natural Resource –Based Conflicts

Resolution mechanisms are the best placed to manage conflicts since they aim at fulfilling the needs of each party through joint construction of legitimate outcomes. Conflict resolution mechanisms are interactive and participatory; the parties attempt to reconcile their differences themselves using a variety of techniques. The negotiations focus is for the ordinary interests of the parties instead of their relative power or position. The aim is to evade dispute overemphasised on how they arise but to make options that please both the joint and individual interests. It may be argued that negotiation is best efficient in conflict management mechanism regarding the management of time, costs, preservation of associations and has been identified as the route preferred in most disputes. Negotiation can be interest-based, power-based or rights-based and each may produce different outcomes. Both parties must take care to generate a number of options before settling on an agreement and avoid hard-line positions or defining the problem in win-lose terms.¹¹⁶ Negotiation may be used in facilitating the effective of management of natural resources based conflicts.

¹¹⁵ Hamilton, G., ‘Rapporteur Report: Alternative Dispute Resolution (ADR) —Definitions, Types and Feasibility’ *International Investment and ADR*.

Available at <http://investmentadr.wlu.edu/deptimages/Symposium%202010/Rapporteur%20Report%20-%20ADR%20DEFINITION%20-%2019%20March.pdf> [Accessed on 3 June 2016].

¹¹⁶ Attorney General’s Office, Ministry of Justice, *The Dispute Resolution Commitment-Guidance For Government Departments And Agencies*, May, 2011, Available at <http://www.justice.gov.uk/downloads/courts/mediation/drc-guidance-may2011.pdf> [Accessed on 08th March, 2014].

3.9.3 Mediation and Natural Resource –Based Conflicts

Mediation in other mean is a continuance of the negotiation process other than having a two-way negotiation, a mediator is called in. Mediation is defined as a standard conflict or negotiation intervention by an acceptable third party who has limited or has no authoritative decision-making power, who assists the involved parties in voluntarily reaching a mutually satisfactory settlement of issues in dispute.¹¹⁷ Mediation allows parties to have independence over the option of the mediator, outcome and the process. The process is related with voluntariness, informality, cost effectiveness, hub on interests and rather than rights, personal empowerment, creative solutions, improved party control, addressing conflict root causes, non-coerciveness and enduring outcomes.

3.9.4 Conciliation

It is similar process to mediation except that the third party can propose for a solution. Conciliator can make parties lose some control over the process by proposing solutions in away but have disadvantages and advantages of negotiation. Conciliation works best in trade disputes. Conciliation has been recognised by several international legal instruments as a means of management of natural resource-based conflicts.

Conciliation is different from mediation whereby third party takes a more interventionist function in harmonizing the two parties. When parties are unable to reach a jointly satisfactory settlement, the conciliator issues a binding recommendation to the parties unless it is rejected by one of them. Conciliator can have an advisory function on the result of its resolution or on the happy of the dispute but it is not a determinative function. A conciliator has no power to inflict a settlement. This is a consideration of the Model Law on

¹¹⁷ Christopher Moore, *The Mediation Process: Practical Strategies for Resolving Conflict*, (Jossey-Bass Publishers, San Francisco, 1996), p. 14.

International Commercial Conciliation of the United Nations Commission on International Trade Law.¹¹⁸

3.9.5 Arbitration

Arbitration is referred as mechanism for dispute settlement that comes in when a neutral third party (known as an arbitrator) is appointing authority or appointed by the parties to determine the dispute and is required to give a last and obligatory award. Arbitration or confidential consensual process is where disputing parties concur to present their grievances to a third party for resolution.¹¹⁹ Its goodness is that parties can agree on an arbitrator to determine their matter where the arbitrator has skill in the matter. Arbitration provide the best vehicle to assist to find justice in disputes involving parties with equivalent bargaining power and one with the need for quicker settlement such as business disputes.

3.9.6 Adjudication and Conflict Management

Adjudication can be defined as the dispute settlement mechanism where a neutral, impartial third-party referred as adjudicator makes a rapid, fair and inexpensive judgment on a given dispute arising over a contract.¹²⁰ It is an unofficial process which functioning under very tight time scales (is hypothetical to achieve a decision within 28 days or the stated period in the contract), flexible and very inexpensive process. It allows the power inequity in associations to be dealt with so that weaker sub-contractors have a clear way to deal with more influential contractors. The decision made is obligatory unless the matter is referred to

¹¹⁸ Article 6 (4) of the Model law states that the conciliator may, at any stage of the conciliation proceedings, make proposals for a settlement of the dispute, UNCITRAL Model Law on International Commercial Conciliation with Guide to Enactment and Use 2002 (United Nations 2002). Available at http://www.uncitral.org/uncitral/en/uncitral_texts/arbitration/2002Model_conciliation.html [Accessed on 3 June 2016].

¹¹⁹ Farooq Khan, *Alternative Dispute Resolution*, A paper presented Chartered Institute of Arbitrators-Kenya Branch Advanced Arbitration Course held on 8-9th March 2007, at Nairobi.

¹²⁰ The Chartered Institute of Arbitrators (CI Arb) (K) *Adjudication Rules*.

arbitration or litigation. Adjudication is therefore effectual in simple disputes that require to be settled within some very severe time schedules. However, in future a possible way to have a framework for settling environmental disputes would be through adjudication.

3.10 Summary

This Chapter has delved into the conflict aspect of land degradation. It has explored the link of how degradation of land and scarcity of resource, also using given theoretical perspectives. It also explored some established management of conflicts and resolution approaches that are applicable to the environmental conflict resolution. These are anchored both in international instruments and domestic law, namely the Kenya's Constitution of 2010. The perspectives offered in this chapter will assist the study evaluate, based on actual findings, which methods have been applied in the MFC, what works, and what adjustments may require to be made in terms of recommendations.

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter presents the study findings whose main goal was to find out the causes and manifestations of land degradation and environmental conflict in MFC and how this interfaces with the term of office and work of the KFS. Also the study attempted to explore how such conflicts may be prevented or resolved peacefully.

Quantitative and qualitative techniques were equally used. The data obtained from the research instruments was analyzed using descriptive statistics (frequencies and percentages) and also inferential statistics using the Statistical Package for Social Sciences (SPSS). Qualitative data analysis method was employed to analyze qualitative data gathered using open-ended questionnaires. The data analysis process entailed the subsequent steps: gathering all the questionnaires issue to all respondents in the sample size, checking questionnaires for completeness, data coding, data collection templates designing like tables, numerical data entering in the templates, response percentages calculation, data for errors checking, and data on pie charts presentation, bar graphs and tables.

4.2 Quantitative analysis

4.2.1 Response rate

The study targeted 30 respondents as sample size. A total of 25 questionnaires were filled presenting 83.3% response rate. This response rate was quite representative, because it conforms to Mugenda and Mugenda (2003) view that 70% and above response rate is excellently rated.

4.2.2 Respondents' background information

The respondent's background information was analysed by use of descriptive methods (frequencies). The background information included: gender, age bracket, marital status, highest education level attained, years one living around MFC for residents and, for KFS officials, their position classification.

4.2.3 Gender

From Figure 4.1, 68% males and 32% females of the 25 respondents participated in the study. The results point towards gender disparity in favour of males in regards to living near the MFC.

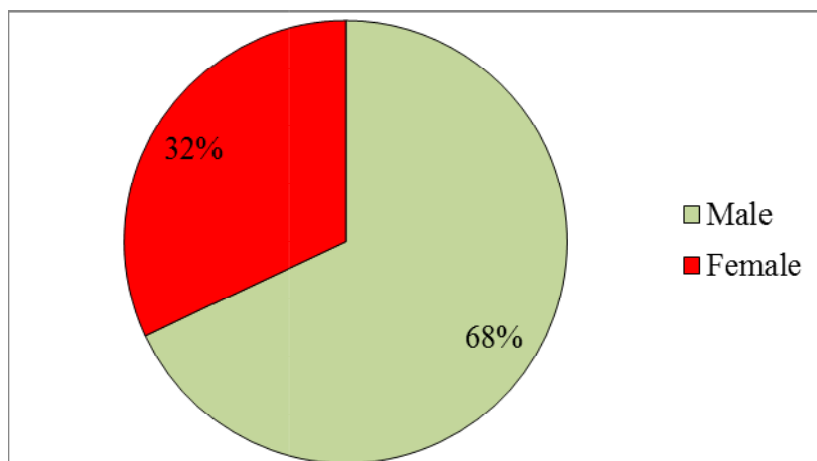


Figure 4.1: Gender of the respondents

4.2.4 Marital status of the participants

As illustrated in Figure 4.2, the findings indicate that irresistible majority respondents (76%) were married. The remaining respondents (24%) indicated that they were single.

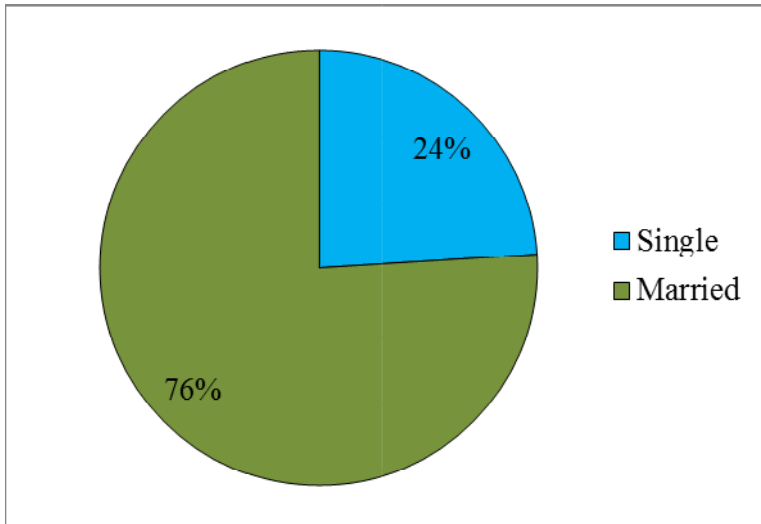


Figure 4.2: Distribution of respondents by marital status

4.2.5 Age bracket of the participants

The findings indicate that most respondents (36%) were between 41-50 years, (28%) were aged between 21-30 years, (12%) between 31-40 years of age whereas (16%) were 51 years and above while (8%) of these respondents refused to disclose their ages. This is captured in Figure 4.3.

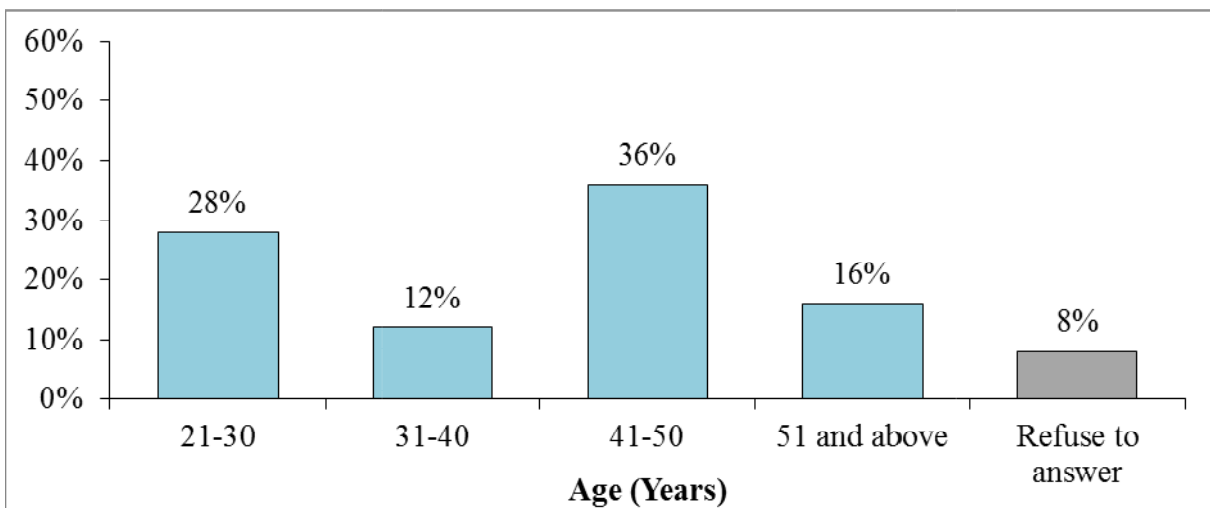


Figure 4.3: Distribution of respondents by age brackets

4.2.6 Distribution of respondents by their highest level of education

The results indicate that (44%) respondents surveyed had certificate as their highest level of education, (36%) indicated that they had a diploma whereas only (16%) had university degree as their highest level of education. However, respondents (4%) did not disclose their level of education. These are captured in Figure 4.4.

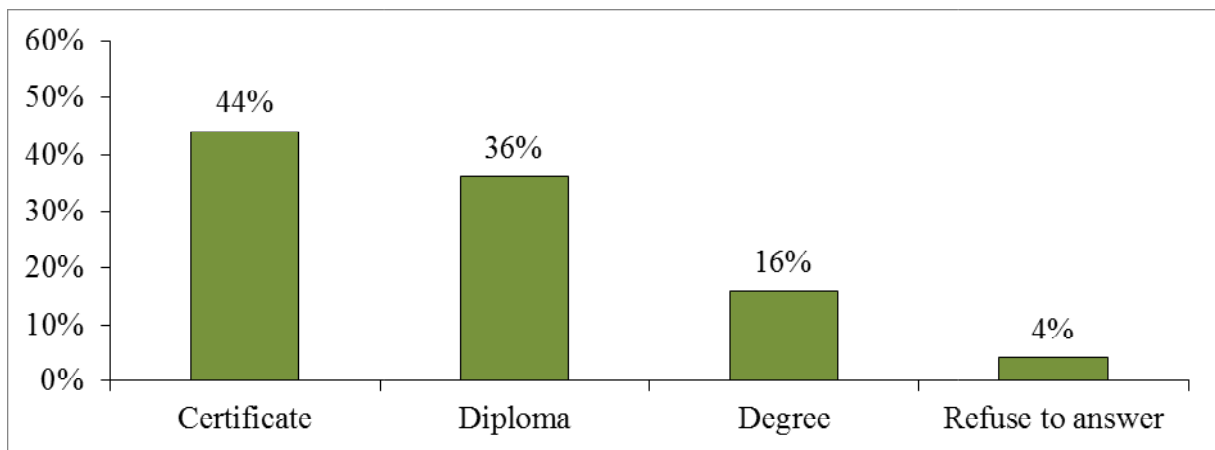


Figure 4.4: Levels of education of the respondents

4.2.7 Distribution of respondents by the number of years they have lived around Mau Forest Complex

Figure 4.5 shows respondents distribution by duration living around Mau Forest Complex. It came out that most of the respondents surveyed (40%) had lived around MFC for more than 15 years while (24%) had just lived between 1 and 5 years, respondents (16%) had lived around MFC for between 6 and 10 years, while (12%) had lived there for 11-15 years.

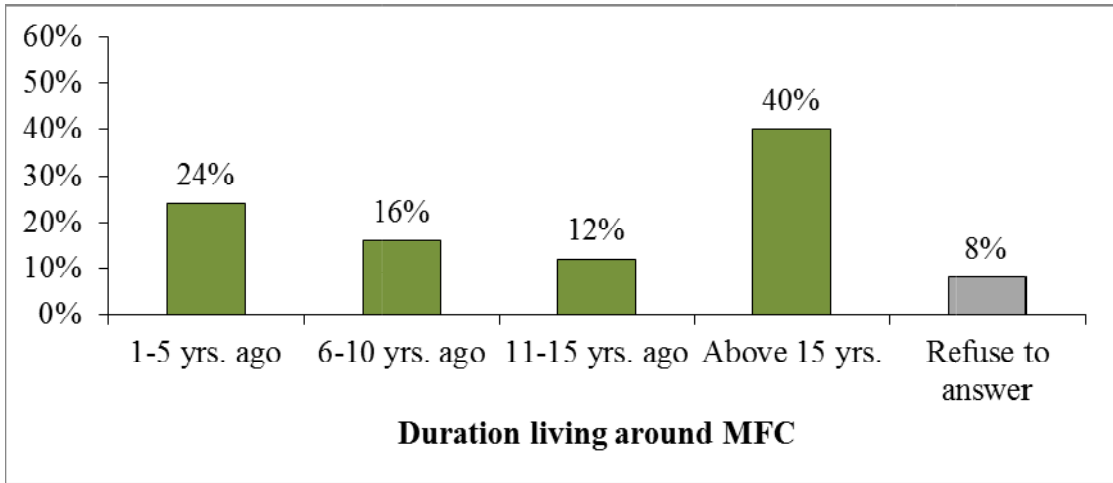


Figure 4.5: Number of years the respondents has lived around Mau Forest Complex.

4.2.8 Position classification for respondents working with Kenya Forest Service.

As shown in Figure 4.6, the survey marks show that only respondents with (48%) were working with KFS. Half of these respondents held non-executive positions with KFS, while others stating that they are part of 'Research & Extension' and 'Administration'.

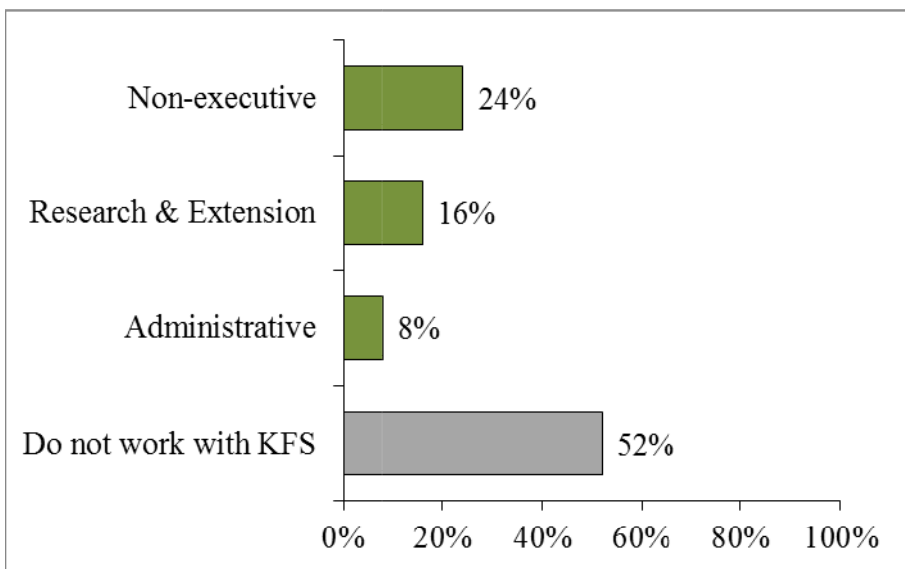


Figure 4.6: Position classification with Kenya Forest Service

4.3 Qualitative analysis

4.3.1 Major drivers of Land Degradation and environmental conflict in the Mau Forest Complex.

Economic factors are the major cause of land degradation in the MFC as stated by (84%) who agreed/agreed strongly with the statement. In terms of rank, cultural beliefs and practices form the second level of causes while technological factors are ranked as stated by (52%) and (36%) of the respondents respectively. The way Figure 4.7 show, the results also confirm that deforestation and land degradation have led to conflict in the MFC.

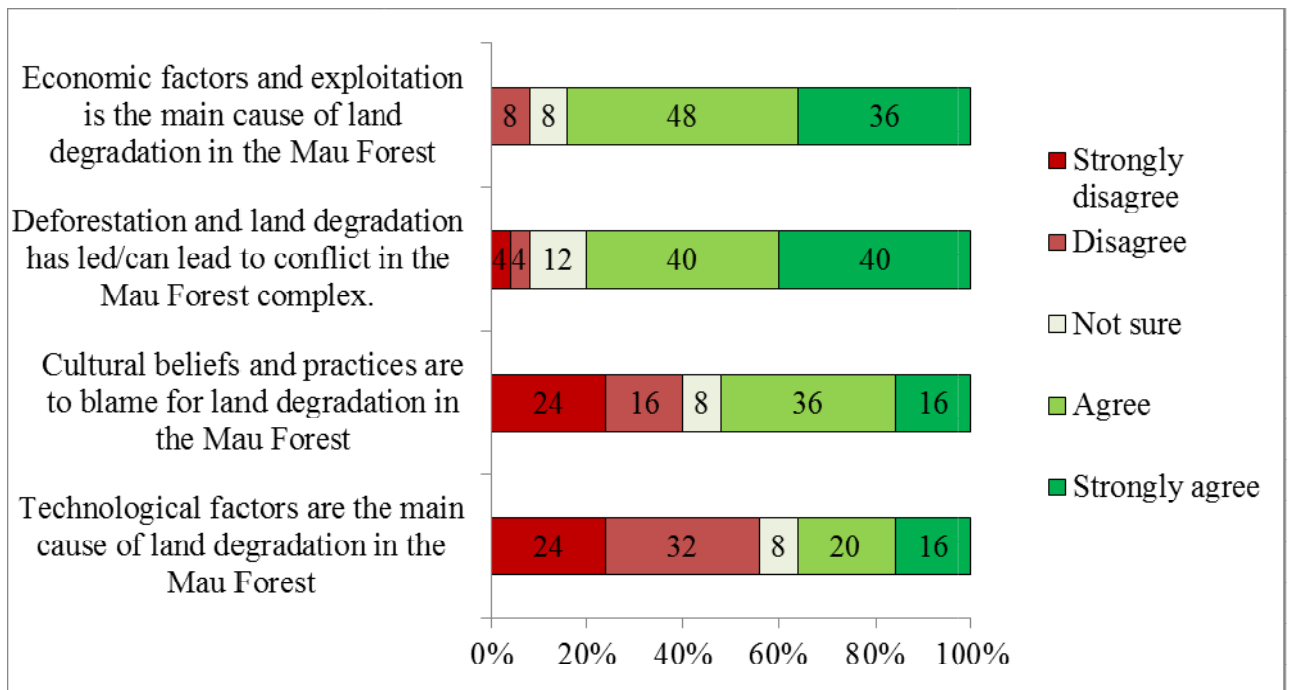


Figure 4.7: Key drivers of land degradation and environmental conflict in the Mau Forest Complex.

When asked about other factors they feel to have contributed to land degradation in the MFC or may cause conflict in the MFC, respondents (40%) mentioned forest fires, (36%) mentioned grazing/over grazing in the forest while (28%) claimed charcoal burning is one of

the main contributors of land degradation in Mau Forest. Other reasons mentioned the way indicated in Figure 4.8.

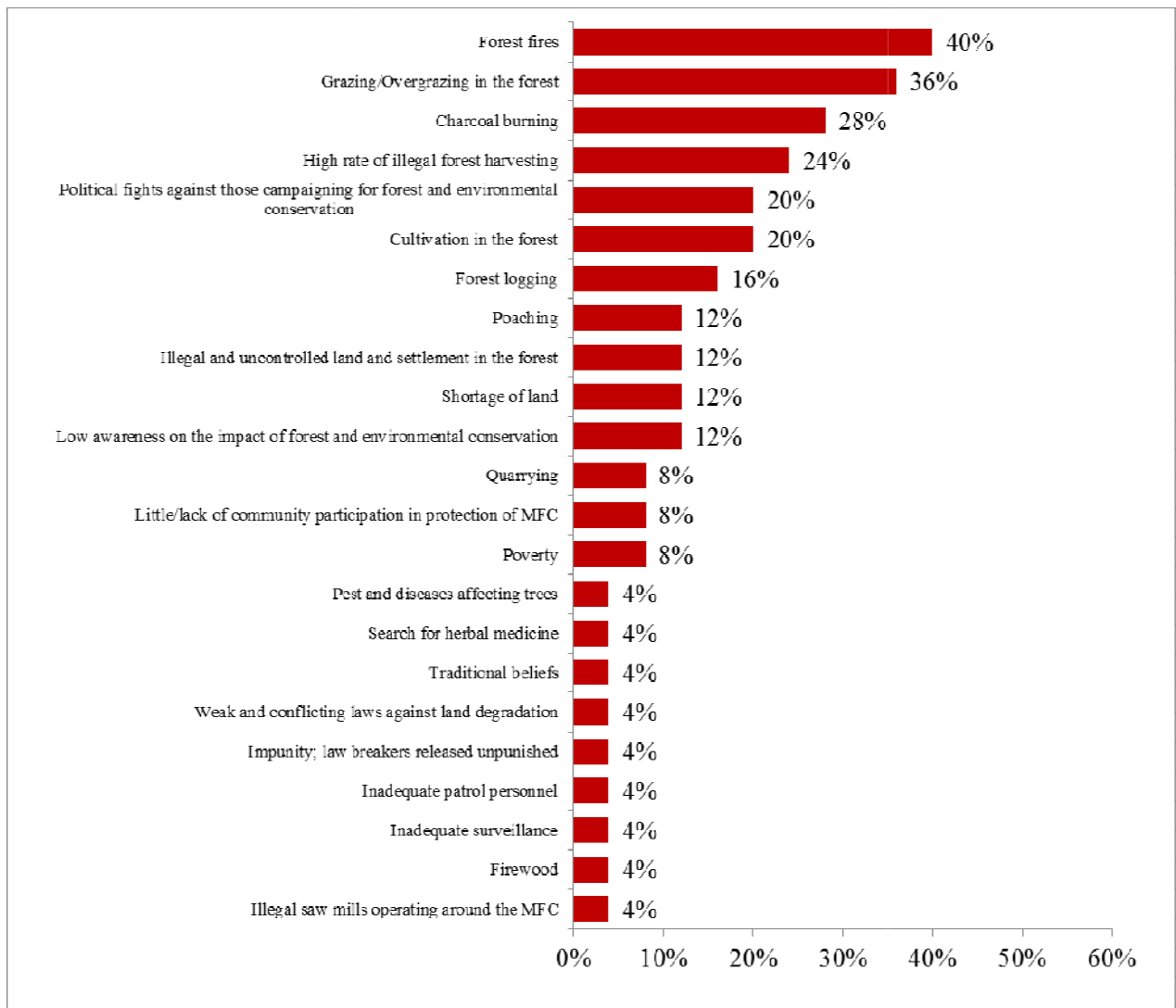


Figure 4.8: Other factors that have contributed to land degradation in the Mau Forest Complex.

4.3.2 The function of institutional policies in causing and/or abetting land degradation and environmental conflict in the Mau Forest Complex.

The survey results also confirmed that uncontrolled settlement and migration have contributed to land degradation and environmental conflict in the MFC as cited by respondents (92%), with (8%) stating that they were not sure. Another contributor to

degradation of land and environmental conflict was political interference, which was mentioned by (78%) respondents. The last contributor identified by (68%) respondents is the historically poor national management policies. These findings are captured in of Figure 4.9. The most promising mitigation measure highlighted by (88%) respondents was involvement of local communities and groups in participations that gear towards combating degradation of land and environmental conflicts.

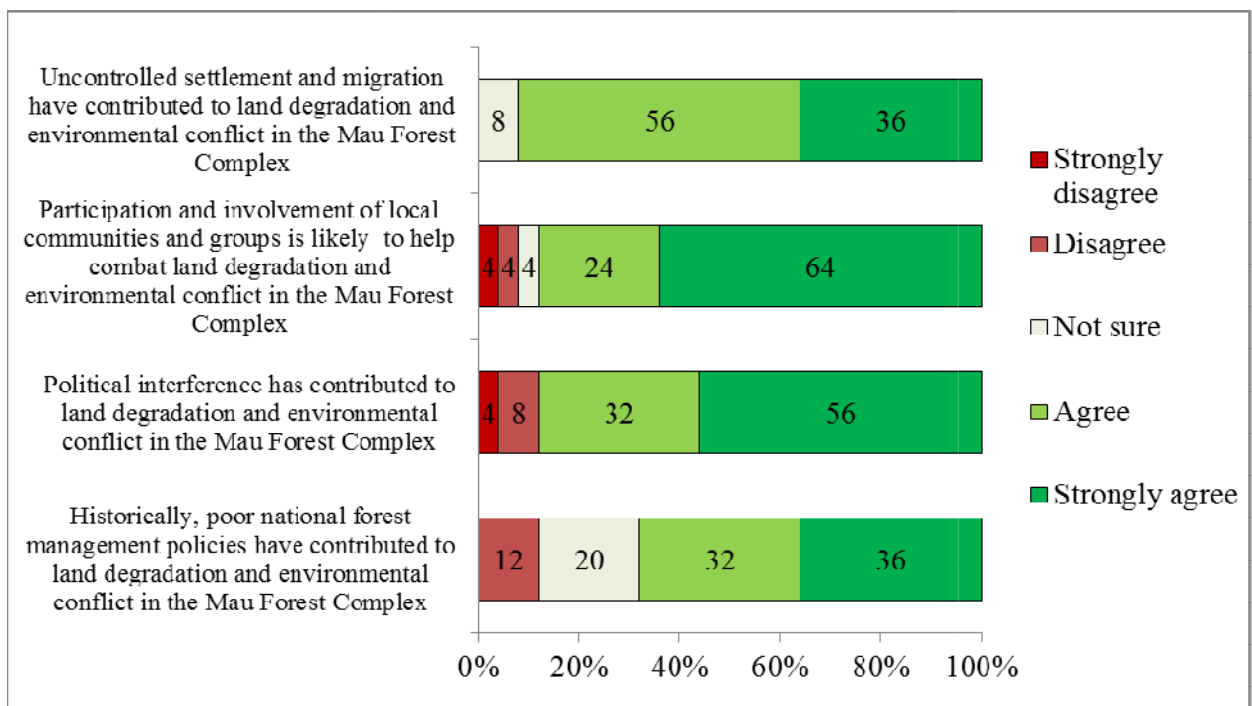


Figure 4.9: The function of institutional policies in causing and/or abetting land degradation and environmental conflict in the Mau Forest Complex in Kenya.

4.3.3 Remedies to faulty policies and governance frameworks that contributed to land degradation and environmental conflict in the Mau Forest Complex.

In understanding the policies and government frameworks that have contributed to degradation of land and environmental conflicts in MFC, the respondents were requested to suggest possible remedies to the above effect. Two core remedies were suggested. Respondents (29%) mentioned strict government forest management policies and punishment

of culprits, and engaging the neighboring communities to take charge of forest conservation. This simply communicates the loose points that exist in the current policies and laws and the neglect of involvement of the local communities in the conservation and management of forest effort. Other remedies suggested by more than respondents (10%) included: training and engaging local communities in KFS meetings; avoiding land excisions; and engaging local politicians and local leaders like Chiefs, Assistant Chiefs, etc. Other suggestions are as shown in Figure 4.10.

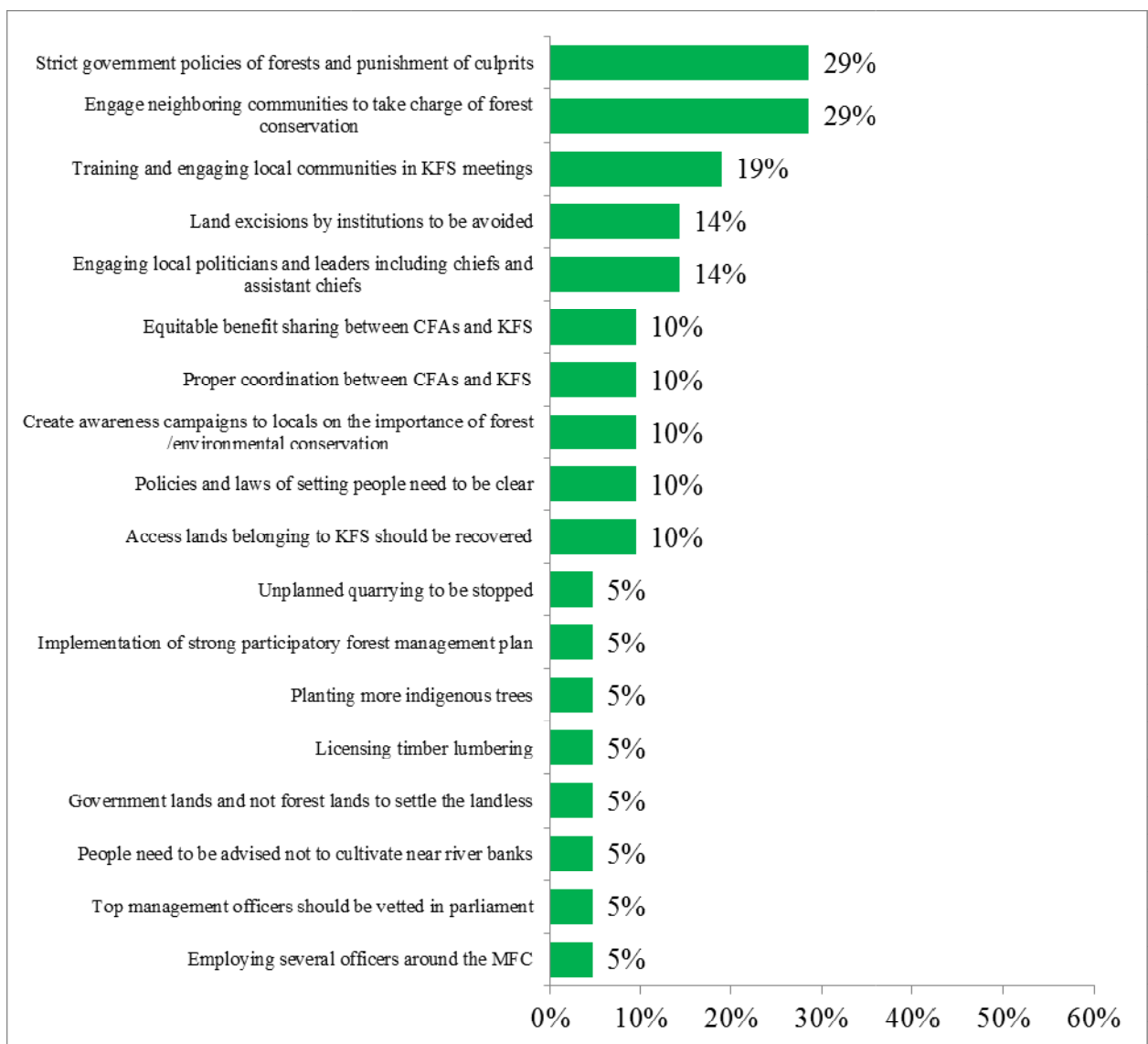


Figure 4.10: Remedies to faulty policies and governance frameworks that have contributed to land degradation and environmental conflict in the Mau Forest Complex.

4.3.4 The function of the Kenya Forest Service in dealing with issues of land degradation and environmental conflict in the Mau Forest Complex.

From the survey, respondents (92%) believe that enforcement of regulations and laws which are relevant by KFS can help in dealing with the issues of degradation of land and environmental conflicts in the MFC with respondents (88%) holding a strong belief that KFS can do better in dealing with these issues. Figure 4.11 summaries the role of the KFS in dealing with these issues.

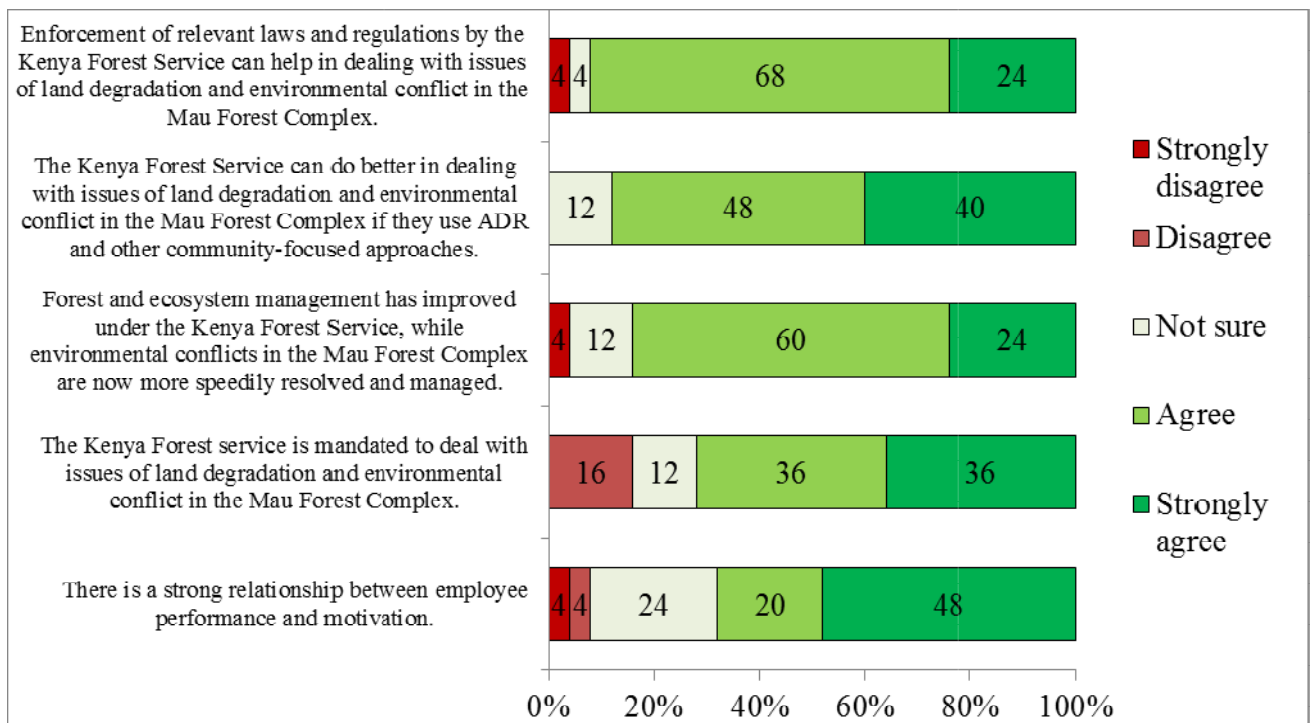


Figure 4.11: The function of the Kenya Forest Service in dealing with issues of land degradation and environmental conflict in the Mau Forest Complex.

4.3.5 Some of the ways that respondents feel Kenya Forest Service has intervened to help prevent and control deforestation and land degradation in the Mau Forest Complex.

While others believe that KFS has done little to prevent/control deforestation and degradation of land around MFC, half of the surveyed respondents believe that KFS has done a lot through engaging communities. (38%) also believe in the validity of the KFS efforts to promote a forestation by giving out free tree seedlings to firewood fetchers. Also, respondents (21%) trust the fact that KFS have engaged in constant mobilization and sensitization of the nearby communities on the forest conservation and protection importance. Other ways that respondents feel KFS has intervened to help prevent and control deforestation and land degradation in the MFC are summarized in Figure 4.12

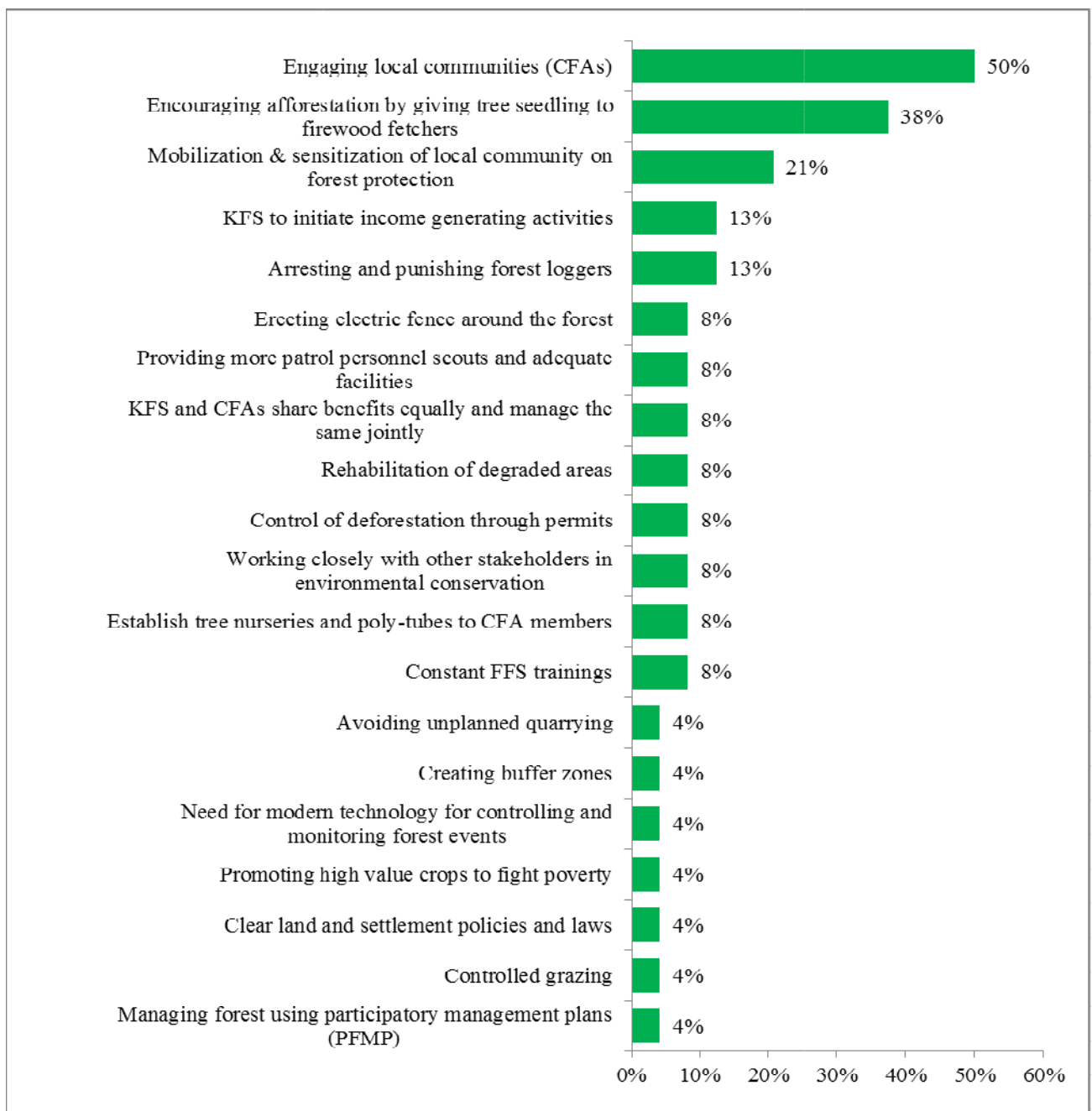


Figure 4.12: Some of the ways that respondents feel KFS has intervened to help prevent and control deforestation and land degradation in the MFC.

4.3.6 Other possible ways/recommendations on how Kenya Forest Service can better handle the challenges of land degradation and environmental conflict in the Mau Forest Complex.

To add on what KFS has done, (30%) of the surveyed respondents still feel that constant mobilization and sensitization of local communities on the impact of forest protection is still needed. Many believe that this is the main important step that KFS should focus on. (22%) also feel that employment of rangers/informants should be done from the nearby community; these should be complimented by constantly engaging the local communities in the struggle in promoting a forestation and reforestation.

4.4 Conclusion

It can be concluded that land degradation and environmental conflict contain facts of life around the MFC, something that is recognized by all stakeholders. The study also finds out that the current situation has been brought about through a mixture of factors, thus suggesting that any remedial interventions must similarly be multi-pronged.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary and key findings

This study contributes to the growing conviction of a link among environmental degradation and conflict against natural resources, which has not been extensively documented. Human needs and issues that include the distribution, allocation and natural resources management will lead to environmental conflicts. The general goal of this study is to establish the causes and manifestations of land degradation and environmental conflict in the Mau Forest Complex and the way these interface with the mandate and work of the Kenya Forest Service.

The Mau Forest Complex is one of the Kenya's most important water towers. It is an important source of rivers that sap into the Lake Victoria, the basis of River Nile, the world longest river. This important resource has come under enormous human pressure, which has caused significant degradation and which is pregnant with the antecedents of conflict. In 1993 and early 1994, for example, areas with forest and plantation were widely burned after a sequence of presidential decrees, which allowed resettlement of evicted settlers after the elimination of the 'shamba' system in 1987. In 1990s and early 2000, several areas of the MFC were excised to settle forest-dwelling communities aiming to conserve the remnant forests. Weak capacity for institutional and poor enforcement of forest laws also have been identified as major drivers of Kenya's forest cover change.

The 7th May 2008 UNEP, the Ministry for Environment and Mineral Resources participation assistance in an aerial inspection of forest destruction in the MFC, which documented the unprecedented level of obliteration and degradation of the Mau ecosystem. Over 80% of the Kenya's land area consists of ASALs with low population density and mainly livelihoods are

based on livestock. Just about 12% is climatically suited of land area with closed canopy forest, where most of which is protected, as Forest Reserves which is under KFS management, as National Parks under KWS management, or as trust land forests under by Local Authorities management.

The study reveals that the growth of human population, agricultural intensification and unsustainable land use practices have resulted in degradation of land and other related problems such as habitat loss, water pollution, natural resources scarcity and even human-wildlife conflict. The study reveals that land degradation and conflict are frequently driven by growth in population, deforestation problems, shortage of water, and soil degradation. In addition, countries which are environmentally-stressed and overpopulated may become at risk of getting politically unstable. Similar conflicts are likely to get worse where the fault lines concur with deep-rooted ethnic, religious, or tribal cleavages. Study contends that environmental or resource scarcity is a prominent cause of violence within the MFC.

History documents how resource-based conflicts have contributed to highly destructive wars in the Karamoja and Kagera regions of Uganda, Sudan within Darfur region, in Rwanda genocide, and in the Niger Delta. The 1994 genocide in Rwanda, for example, has been attributed to, among other factors, the scarcity of arable land, falling prices for agricultural produce and poor institutional quality. Thus, land degradation and environmental conflict in the MFC present a clear and present threat, not just to Kenya's domestic political stability and achievements of its goals under Kenya's Vision 2030, but is has significant regional and international threats as well.

The survey established that different types of conflicts can be traced at the MFC, including the micro–micro and micro–macro level conflict (i.e. against groups in community or among community groups and outside government, private or civil society organisations). The study

found conflicts between the old (indigenous) inhabitants of the MFC, people who had earlier been evicted through government schemes, and those who have subsequently resettled on the suburbs of the forest. Conflicts were also noted in regime of the management, between the management sections of National-government of the MFC (through the KFS) and the County Government of Narok managed areas, with the latter particularly badly affected by degradation of land and conflict.

The study describes to the fundamental understanding of conflict as natural and inevitable in human existential dynamism, and thus it is as good as a motor of change that idea of conflict change is based on a basic concept.¹²¹ Conflict is experience whenever incompatible actions happen that prevents obstructs, interferes or injuries are contributed to other groups. Thus, the necessity of sharing, acquiring, maintaining or preserving natural or human resources is a necessary cause of environmental conflict. For the classical idea of conflict as inherent and an inevitable feature of social change that generates new heterogeneity of interests, values, and beliefs. However, as Clark observes, “stability in itself can be an indicator of social stagnation and potential decadence. If so, a more positive light of social tension would be seen as an indication of social change dynamics and as social progress inevitable factors.”¹²²

Thus, conflict simply wants to be managed through transformative approaches that better handle the agony of change and ensure just and equitable outcomes for all stakeholders for a harmonious co-existence. Thus, the study outcome can be used in formulating suitable resource utilization policies with intensive community involvement.

As conceptualised by the Ecological Modernization Theory the interests, ideas and considerations of ecological movement interest in social practices and institutional developments that marks the process of change and reform in ecology-inspired and

¹²¹ John P. Lederach, *Little Book of Conflict Transformation* (Intercourse: Good Books, 2003), p. 14

¹²² Kenneth B. Clark, *The Pathos of Power* (New York: Harper and Row, 1974), p. 60.

environment-induced processes of change and reform going in the core practices and central institutions of modern society. Thus, the Kenya Forest Service functions must similarly evolve, including its approaches, to better keep up in social and environmental dynamics of both management of forest and conflict. In that case, enlightened forest management regimes have to take into account of the technological development functions, economic expansion, and the environmental growth governance in creating and also mitigating environmental problems. Thus, a major challenge for the Kenya Forest Service is: in what ways can it utilise technology, which is otherwise destructive of the environment, to what effects of environmental degradation mitigation arising from both climate change and human interventions at the Mau Forest Complex?

Also, as we learn from the perspectives of the Lateral Pressure Theory, the study has presented literature to the effect that violent conflict due to resource depletion can be more common at the intrastate level instead of the interstate one. Thus, unresolved environmental issues like forest cover loss, water towers destruction and loss of water resources may cause conflict. Resource scarcity and environmental degradation are thus often at the root of both intra-state and inter-state conflicts. The study has presented arguments showing that the nascent causes of environmental conflict include resource depletion, loss of forest cover, destruction of water towers and loss of water resources. The question at this juncture is: What are some of the relevant and workable recommendations on how the environment and resources may be better managed to prevent conflict?

5.2 Conclusions

The key resources which support community livelihoods include water, land, wildlife and aquatic vegetation. To a large extent, these depend on natural endowment, specifically continuous canopy forests like the Mau Forest Complex. It is in recognition of its primary

role in influencing climate and livelihoods that the Mau Forest Complex has been designated a ‘water tower’, whose influence covers entire parts of Kenya and the region through its contribution to the Lake Victoria and the River Nile head water. It is undeniable that, because of a combination of factors, including the policy failures and human interference, the Mau Forest Complex has suffered serious damage, something that has serious ramifications not only just to the local communities but to the country and region at large. All actors and stakeholder, including administrators, political, community and religious leaders, and even researchers and academicians have a strong interest in the proper conservation and management of the Mau Forest Complex. It is in that spirit this study offers its recommendations as follows:

5.3 Recommendations

1. Policies, incentives measures to address degradation deforestation

The study findings indicate that among the key policies and incentives that could help reverse forest degradation and deforestation in the Mau Forest Complex are:

- i. Effective cost- benefits sharing the resources of forest with local communities.
- ii. Full implementation of Charcoal rules and Forest Act, 2005.
- iii. Formulation of regulations that take into account local traditional values on and uses of forests
- iv. Earlier policy enforcement of having buffer zones of 100 meters all around the forests to be controlled by Nyayo Tea Zones or other similar concept.
- v. Adequate funding of forest protection, especially the Kenya Forest Service to improve its capacity for protection, management, and conservation of the Mau Forest Complex, including enforcement of the laws and regulations which are relevant.

2. *The most promising mitigation measure highlighted by respondents (88%) was involvement of local communities and groups in participations that gear towards combating Land Degradation and environmental conflicts. Thus, local communities must be accorded an appropriate package of incentives for to actively participate in the forest conservation and protection for forest resources, including;*
 - i. Conservation funds
 - ii. Extension services
 - iii. Forest product market chain enhancement
 - iv. Charcoal regulations
 - v. Waiver of forest product and service rates
 - vi. Co-management of resources
 - vii. Benefit sharing
3. *Augmenting the ability of the Kenya Forest Service and other key local stakeholders through systematic and enduring interventions such as:*
 - i. Better budgetary support through increased allocations and more streamlined donor support mechanisms
 - ii. Development of human and financial capital resources
 - iii. Capacity building of local communities through advocacy and enhanced awareness creation
 - iv. Development and implementation of existing and new management plans
 - v. Use of capacity building in creative and alternative dispute resolution management approaches e.g. transformational conflict management, mediation, arbitration, etc.
 - vi. Identification and gazettement of trust land of forest for conservation purposes

- vii. Placement of all endangered forest and forest segments under the Kenya Forest Service at least for rehabilitation purposes, after which these may revert to other management regimes e.g. the County Government of Narok.

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APPENDIX I: SURVEY QUESTIONNAIRE/INTERVIEW GUIDE

TOPIC: THE ROLE OF THE KENYA FOREST SERVICE IN LAND DEGRADATION AND ENVIRONMENTAL CONFLICT MANAGEMENT IN THE MAU FOREST COMPLEX IN KENYA

My name is Samuel Kariuki Mwaniki. I am undertaking a Master's degree in International Conflict Management in the Institute of Diplomacy and International Studies of The University of Nairobi. As part of the academic programme requirements, I am currently conducting a survey on the role of the KFS in dealing with issues of Land Degradation and Environmental Conflict Management in the Mau Forest Complex. Kindly take a few minutes of your time to respond to this questionnaire to help us understand some things better. The information you provide us will be kept strictly anonymous and confidential and will be used solely for the purposes of this survey.

SECTION A: Background information

Tick or write answers in full where applicable.

1. Gender

- a) Male b) Female c) Other

2. Marital status:

- a) Single b) Married c) Widow(er) d) Divorced

3. Age bracket (years)

- a) 21-30 b) 31-40 c) 41-50 d) 51 and above

4. Highest level of education attained

- a) Certificate b) Diploma c) Degree d) Postgraduate

5. When did you start living around the Mau Forest Complex?

- a) 1-5 years ago b) 6-10 years ago c) 11-15 years ago d) 15 and above

6. If you work at KSF, what is your position classification?

- a) Administrative b) Research and Extension c) Non-executive d) Executive

SECTION B: Key drivers of land degradation and environmental conflict in the Mau Forest Complex

On a scale of 1-5, tick in the appropriate box on how you strongly agree or disagree with the statements given.

Scale	1	2	3	4	5
	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree

Statement	1	2	3	4	5
1. Cultural beliefs and practices are to blame for land degradation in the Mau Forest					
2. Economic factors and exploitation is the main cause of land degradation in the Mau Forest					
3. Technological factors are the main cause of land degradation in the Mau Forest					

4. Deforestation and land degradation has led/can lead to conflict or is the main cause of land degradation in the Mau Forest.					
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5. Outline any other factors that you feel have contributed to land degradation in the Mau Forest/and or may lead to conflict in the Mau Forest Complex.

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SECTION C: The role of institutional policies in causing and/or abetting land degradation and environmental conflict in the Mau Forest Complex in Kenya

On a scale of 1-5, tick in the appropriate box on how you strongly agree or disagree with the statements given.

Scale	1	2	3	4	5
	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree

Statement	1	2	3	4	5
1. Historically, poor national forest management policies have contributed to land degradation and environmental conflict in the Mau Forest Complex					
2. Uncontrolled settlement and migration have contributed to land degradation and environmental conflict in the Mau Forest Complex					
3. Political interference has contributed to land degradation and environmental conflict in the Mau Forest Complex					
4. Participation and involvement of local communities and groups is likely to help combat land degradation and environmental conflict in the Mau Forest Complex					

5. Suggest ways in which you feel that faulty policies and governance frameworks have contributed to land degradation and environmental conflict in the Mau Forest Complex. In what ways do you think this can be remedied?

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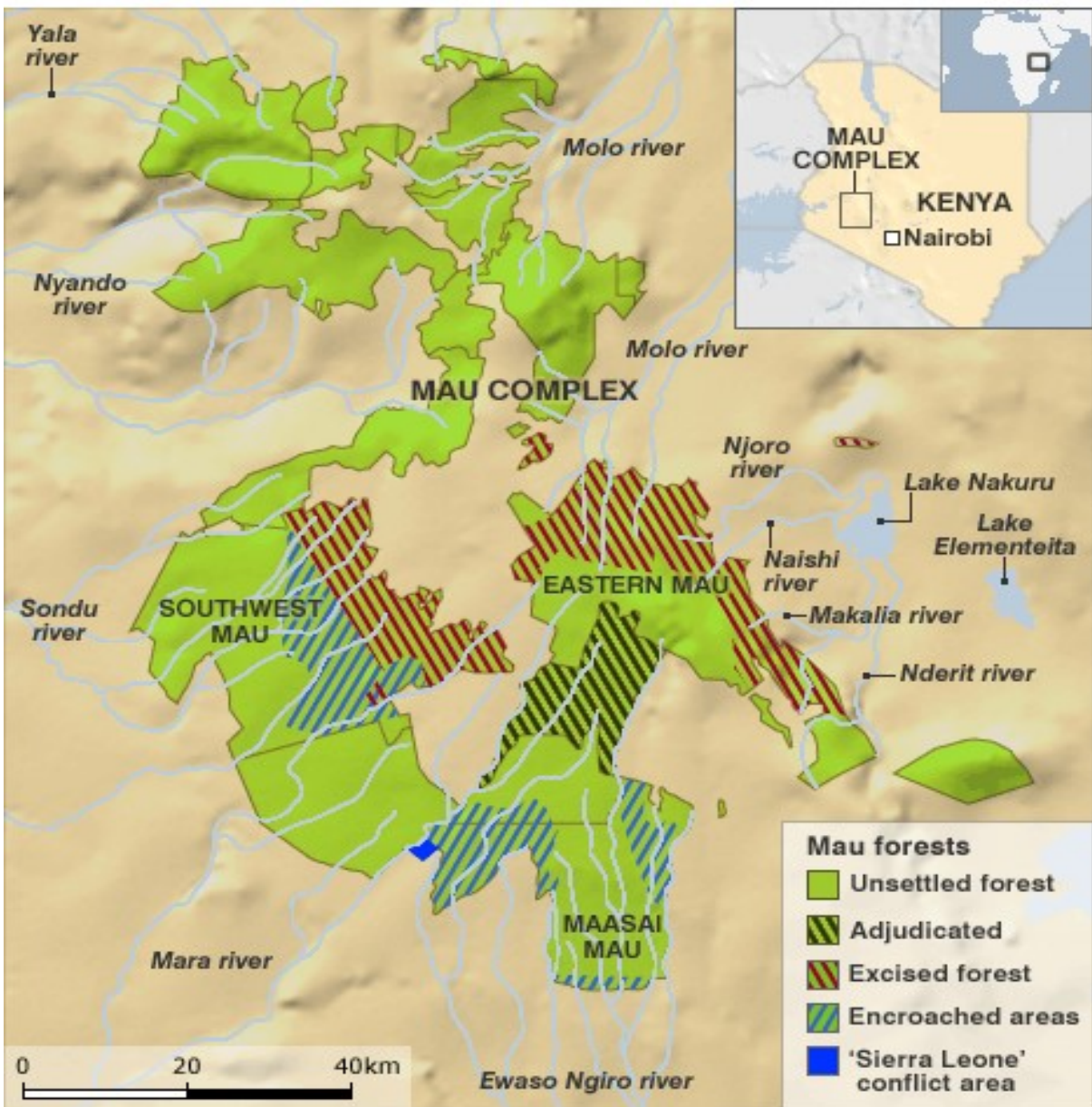
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APPENDIX II: RESEARCH SITE MAP

Kenya's Mau forest complex



Map of the Mau Forest Complex showing South West Mau, including areas of encroachment

APPENDIX III: FIELDWORK BUDGET

Budget Category	Amount (KSHS.)
Stationery (Writing, printing& photocopy)	25,000
Communication (Email and telephone)	20,000
Transport and field expenses	75,000
Field assistant Stipend	65,000
Miscellaneous (20%)	37,000
Total:	222,000/-