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INSTITUTE OF DIPLOMACY AND INTERNATIONAL STUDIES

**THE IMPACT OF ENVIRONMENTAL DEGRADATION ON
SECURITY: A CASE STUDY OF MAU FOREST**

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FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF
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MANAGEMENT**

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DECLARATION

I, the undersigned, declare that this project paper is my original work and it has not been submitted for an award of a degree in this University or any other institute of Higher learning for examination.

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R52/73845/2014

This Project paper has been submitted for examination with my approval as the university supervisor.

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DEDICATION

This study is dedicated to my entire nuclear family and Catholic Diocese of Murang'a.

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LIST OF ABBREVIATION

API	African Policy Institute
AU	African Union
CO2	Carbon dioxide
EAC	East Africa Community
ED	Environmental Degradation.
EIA	Environmental Impact Assessments
EU	European Union
FAO	Food Agricultural Organization
GDP	Gross Domestic Product
GHG	Green House Gas
GoK	Government of Kenya
ICM	International Conflict Management
IDIS	Institute of Diplomacy and International Studies
IMF	International Monetary Funds
KANU	Kenya African National Union
KMC	Kenya Meat Commission
KNBS	Kenya National Bureau of Statistics
KSH	Kenya Shillings
MNCs	Multinational Corporations
NCCRS	National Climate Changed Response Strategy.
NEMA	National Environmental Management Authority
NGOs	Non-Governmental Organizations

NRM	Natural Resources Management
PES	Payment of Ecosystem Services
PEV	Post-Election Violence
T21	Threshold 21
UN	United Nations
UN_HABITAT	United Nations Human Settlements Program
UNEP	United Nation Environmental Program
UoN	University of Nairobi
USA	United States of America
WB	World Bank

ABSTRACT

Environmental degradation is progressively a security problem. The increase of environmental degradation has led to the escalation of structural and violent conflict. In this regard, Mau forest has undergone serious destruction as a result of growing population. It is therefore for this part of research which will examine implications of environmental degradation as a result of vulnerability to scarce resources, security as well as violent conflict. It is also important to interrogate the mandate of a legitimate government in protection of human life, properties and environment. The implication here is that if a government does not put proper mechanism and policies to curb environment degradation, this will threaten and undermine prosperity of the future generation. Services of security agencies can be diverted to offer humanitarian activities. Environmental degradation has both direct and indirect consequences based on security hence increases propagation of structural violence as well as violent conflict. This research paper focuses on the implications of destruction of Mau complex and carryout an empirical research into the dangers and threats of its destruction and in the long run, transforms human security and conflict into peace and peace building.

CHAPTER ONE

1.0 General Introduction

In the contemporary world, competition of environmental natural resources continues to manifest itself among different stakeholders, actors and multinationals with varying pursuits. These pursuits are for example; current trends of rural urban migrations, globalization, industrialization, homelessness, joblessness, religious radicalization and more so poverty all which have threatened environment and human security. These threats have deteriorated degradation of environment which is evident in different parts of the world. According to Kenya Threshold 21 Starting Framework model approximate of 60 percent of the ecosystem are being degraded.¹In this regard, forests and other woodlands systems are the most vulnerable because they are main sources of income and livelihood for majority of Kenyans. With this in mind, the detrimental impacts of environmental degradation are being borne disproportionately by less fortunate, politicians thus leading to inequalities among the people and in most cases they are the main causes of environmental conflict and poverty². Mau complex and its environ aren't exceptional of this conflict.

Still being confronted by the limited job opportunities in rural areas, there is inadequate control of forest policies and other natural resources. This implies that there is more reaping of forests products just to meet basic necessities and other livelihood needs³. In this regard, conflict erupts between government agencies, different communities through the competition of forest resources, leads to death of population,

¹GoK, "Report on strengthening Institutional Capacity for Integrated Climate Change Adaptation and Comprehensive National Development Planning in Kenya". Government press, Nairobi, 2012.

² See "R., Cronin, "Exploiting Natural Resources, Growth Instability and conflict in the middle east Asia", Washington DC, Henry L. Stimson Center, 2009.

³ Ibid 2.

aridity as well as desertification⁴ . With this increased resources scramble, conflicts escalate to higher notes thus resulting to violence. The situation of a number of conflicts around Mau forest is a clear manifestation of all to have proper expertise in managing conflict and natural resources as well as forestry⁵ .

As forests do regulate climate, qualify rainfall and slow aridity and desertification, they are also agents of carbon dioxide storage for an indefinite period of time. With all these advantages, deforestation and encroachment into the forests are visible where negative effects are being felt significantly. This means that forests are important ecosystem and acting on the role of water towers and there are environmental conflict induced disasters associated with this. Rainfall for example, is determined by the location of forests which means that cutting down of trees leads to change of rainfall patterns thus facilitating droughts, arid and semi-arid lands. Moreover, as a result of unpredicted sustainable rainfall for subsistence farming, some people have engaged into Green House farming and there is Green House Gas (GHS) emission as a result of deforestation, agricultural reduction productivity thus compromising livelihood.

1.1 Background of the Study

Environmental degradation had and still has serious implications to all sectors in the society which affect people differently in all circles of life. This means that the importance of forests cannot be underrated. This is because forests regulate climate thus emergence of desertification, thus makes people vulnerable to lack and inadequate food for their sustainability. In Kenya there are three major wooded areas which are Mount Kenya, Abadares and Mau Complex. The researcher will concentrate to Mau

⁴Kaplan, R., "The Coming Anarchy". The Atlantic monthly 1994.

⁵UNESCO. "Second water development report. Paris: United Nations Economic Scientific and Cultural Organization". 2006.

forests which are located in part western of Rift valley, Kenya and it is a major source of many rivers which all leads to Lake Nakuru and Lake Victoria where Lake Victoria is the major source of River Nile. As a major water tower, biodiversity has been encroached and this dictates the change of rainfall pattern causing recurring droughts and more importantly desertification. This has more effects on agricultural production, thus compromise livelihood of the population.

In this research, the researcher will look the effects of population growth as well as the expansion of its demand for land which is one of the agents that trigger environmental degradation especially desertification⁶ . More so, it is from rural urban migration where charcoal has increased demand and facilitates to deforestation. Generally, at the attainment of independence in Kenya, the year 1963, reduction of closed canopy forests is manifested from 3.0 percent to 1.7 percent⁷ . With this in mind, even economic areas such as tourism, pastoralist, generation of energy, cash crop and subsistence production all depend on environmental services which are provided by diminishing Mau forests.

1.2 Problem Statement

The population growth has reached to an advanced stage in Kenya where at independence the population was approximate 15 Million people and in the economic survey of 2015 the population hit 41.5 million. As a matter of fact, the effects can be visible all over the country through modernization and industrialization where some of the forests areas have to be cleared due to rapid growth of population in order to establish human settlements as well as industries. Without any prejudice, the cutting down of tress for industrial development and other means of livelihoods has threatened

⁶GoK, "Natural Climate Change Strategy." Nairobi Government of Kenya. 2010.

⁷Stockholm Environmental Institute. "Economics of Climate Change in Kenya." Stockholm 2009.

the significance changes taking place in relationship between the population and the physical environment. The perceived successes of population growth have created an atmosphere of conflict where these given population have to scramble for the scarce resources and forests are the greatest target.

An ongoing debate over the restoration of Mau forests and relocation of the population that has encroached it, at the same time has resulted to conflict and skirmishes, limited the growth of water catchment areas. More problems are even after the resettlement of these populations elsewhere, there is the prosperity. Without any prejudice, the shift from restoration of the forests to the modernization and development might continue to be unsustainable due to high demand of wood for construction in urban center, charcoal for domestic use which at the same time gives environmental uncertainties as a result of this affluent population.

As we know industrial development cannot be sustained without population, the major concern is how are we going to sustain this modernization, population and industrialization without encroaching to forests and destroying even wildlife habitat? What is the viability of deforestation for economic stability which is for short term? Concern for population and protections of forests is supposed to be a long-term for human progress in the line with Brundtland commission which *states that we need to meet our demands of the present without compromising the ability of future generations to meet their own needs freely.*

The learner seeks to find out the role of population growth as well as human activities which have led to the decline of Mau complex which is one of the biggest water towers in East Africa with an approximate 273,300 HA⁸. Population growth has

⁸ Wass, P., (Ed.). "Kenya's Indigenous Forests: Cambridge," UK. 205 PP. 1995.

led to decline of major rivers which are tributaries of Lake Victoria and Lake Nakuru just to mention but a few. This means that the researcher will dig into economic, social and political implications of destruction of Mau complex. Moreover, what are the human activities associated with the destruction of environment, why human population encroach into restricted areas and what are their effects on land use, its biodiversity, forest cover at the expense of water, cropland, rangeland, forests and marine resources.

1.3 Objectives

This study will be guided by both general and specific objectives.

1.3.1 General objectives

The main objective of this study is to examine the link between environmental degradation and violent conflict in Mau forests' Complex.

1.3.2 Specific objectives

The researcher will be guided by the following specific objectives:

1. To examine the causes of environmental degradation in Mau Complex.
2. To examine the impacts of environmental degradation on community relations and security in Mau Complex.
3. To determine the effects of environmental degradation on violent conflict in Mau Complex.
4. To investigate the efforts made by various actors to curb environmental degradation and insecurity.
5. To offer recommendations and finale to curb environmental degradation and violent conflict.

1.3.3 Research Questions

The following questions will guide the researcher in his study:

1. What are the causes of environmental degradation in Mau complex?
2. What is the impact of environmental degradation on communities and insecurity in the area?
3. What is the effect of environmental degradation on violent conflict in Mau Complex?
4. What are the efforts conducted by various actors to curb environmental degradation and insecurity?
5. What is the conclusion, recommendation in environmental protections and conflict transformation?

1.4 Justification of the study

As much as this study poses dangers and threats of environmental degradation and conflict, it is important and especially to the developing nations to employ strategies and policies for environmental protection. This is as to avoid issues like heat waves and global warming. The study recognizes that the fact that deforestation is an environmental conflict and a real threat hence Mau forests need to be managed properly so that the environment on which natives finds themselves within to be of great help to them and the entire world.

At the same time, as forests and conflict are being independent disciplines, they have been fragmented into the discipline of International Conflict Management (ICM). This is because ICM is a multi-disciplinary course with diversity that leads to peace building for both population and environment. Despite on having numerous researches being conducted by both individuals and global bodies like United Nations (UN) on

deforestation and conflict, danger and threat experienced in Mau forests is still a problem to Kenya as a nation and the neighboring nations. In this paper, the researcher will try to use systemic analysis and identify the gaps left out in the previous conducted research and this is through explorations of new concepts and ICM theories in environmental conflict.

1.5 Significance of the study

Without any prejudice, in the modern world there is increased use of forests products and scramble of natural resources. This can have contributing to desertification and aridity to most of the part of the Mau forest and globe at large. In the final analysis there is high increase of poverty and those people rely with forest habitats. Conflict cannot be left out as some of the population is tried to be resettled in different parts of the country. ICM played an important role especially in post conflict transformation into an egalitarian community. It is therefore important to draw attention to the role of forests, conflict and environmental degradation for environmental protection.

As the dangers of environmental conflict will be felt and become more apparent in the next few years to come in Kenya. The reason here is that Kenya is still in initial stages on the issues of environmental protections and conflicts. The implication here is that if as a nation we hesitate to cater for environmental threats and conflicts we risk of becoming a semi-arid or arid nation wholly. It is therefore important to anticipate the outcomes of environmental threats and use of the strides made so far so that citizen can benefit from natural and unpolluted environment.

On the other hand, this ideal condition cannot be realized without confronting those challenges adequately. This means that we need to draw much attention on the

issues that threaten and endanger the environment. In the final analysis, this study is important because of the application of ICM theories and typologies and suggests models which can help Kenyan people and world at large to protect environment for the betterment of future generation of both wildlife and human population.

1.6 Environmental degradation and poverty:

The current literature establishes that the world population is 7 billion and at the year 2050, it will hit 8 billion. In this regard about 2.8 billion live in absolute poverty with an additional 1.5 billion living in substance standards⁹. As a matter of fact, there is no reduction of relative poverty but on the other hand, increases in disparity between rich and poor has been noted both in local and global arena¹⁰. The implication here is that the situation will worsen when the poor discover their own resources. This is for example wealth acquisition which is gained through natural resources for example forests where most of the population depends to it for their livelihood.

According to the World Bank and Kenya economic survey of 2015, household expenditure is the one used to measure the poverty line and especially if one is living below one American dollar¹¹. This means that if an individual whose household's expenditure is below one dollar a day is regarded as a poverty stricken individual. This is done through basic necessities as well as necessities consideration. The current literature views this as a narrow way in determining poverty level where other indicators with broader understanding should be used like infant mortality rate, level of

⁹ See "UN population Division world population prospects accessed may 2016: www.un.org/esa/population/publication/wpp2015/wpp2015_text_tables.pdf.

¹⁰Chambers, R., "Sustainable Rural livelihoods: a strategy for people, environment and development." Institute of Development Studies paper no 7 Sussex, UK: 2000.

¹¹ GoK (2015). "The Economic Survey". Government press.

education and literacy are supposed to be used¹² . Despite this argument from scholars and overdevelopment from UN and UNDP, the people below the poverty line are confronted by great challenges and uncertainties facilitated by environmental degradation.

For the sake of this research paper, the learner will combine poverty and environmental degradation as a measure of vulnerability to acquire livelihood¹³ . This means that through vulnerability a line can be drawn to arrest a huge proportion of individuals who are easily pushed into poverty when environment is degraded and these people rely on environment for their daily livelihood. Without any prejudice environmental degradation is caused by deforestation, inadequate of water and its contamination, different forms of pollutions, degradation of land and loss of its biodiversity¹⁴ as some of the challenges that confront the developing nations as a result of environmental degradation. Despite likelihood of poverty, environmental degradation is composed of higher degree on the people who own these resources and using them is of great concern. This means that environmental degradation is a very complex concept for example degree of deforestation and pastoralism and agriculture where natives have to tolerate to this level of environmental degradation. In a nutshell, the analysis of environmental degradation and its conflict its pose several mechanisms which are supposed to be revealed and adhered to so as to reduce deforestation and poverty.

¹²Anand; S. & Hams; C. J. "Choosing a welfare indicator. American Economic Review and proceedings". May 1994.

¹³UNDP, "Disaster-Conflict Interface: Comparative Experiences," UNDP, New York, 2011.

¹⁴World Bank's, "World Development Report", Washington 2000.

1.6.1 Poverty and human security

Through universal declaration of Human Rights, security is a basic entitlement of any individual. Environmental degradation and poverty threaten the lives of majority of citizens. This is for instance globalization and capitalisms are some of the concepts that hinder development of people who are below poverty line and they have no option other than relying with environment so that they meet their basic necessities¹⁵. Poverty incapacitates citizen and thus creates an environment of insecurity where some people end up encroaching into restricted places by either government or international law. There is cause of alarm from citizens when the government is not in a place when it wants to rehabilitate the forests fragmentation of population as well as violent conflict is experienced¹⁶. As a consequence, lives are lost, destruction of properties, displacement of families which is a threat to human security. At the same time due to destruction of environment in a country like; Kenya which almost 70% with agricultural practices which are rain fed, food insecurity will be experienced, tourism industry.

1.6.3 Environmental degradation and resource depletion

Tourism is vulnerable to such undertakings especially the migration of wildest. At the same time pastoralism will be vulnerable due to the drying up of rivers which will contribute to social erosions as a result of overgrazing. Moreover agricultural production will reduce due to this overgrazing and deforestation which will contribute to drought and both internal and external conflict.

¹⁵ Muti, S.M., & Kibe, A.M “The Effects of east African Low Level Jet on Food security”. Mombasa Kenya. 2009.

¹⁶ See R. Cronin., “Exploiting Natural Resources, Growth, Instability and conflict in the Middle East Asia”, Washington DC. 2009.

1.6.4 Environmental degradation as a Threat to security

Protection of environment and security are intertwined and at the same time, the proponents who look at the interwoven of these two are key in the debate of environmental and security. Without any prejudice, environment and security need not to be separated as issues like demographic figures, climatic changes and loss of diversity¹⁷ will be always affecting the security of a given nation. This means that problems that are associated with environment which have either direct or indirect impacts on a nation or international based on the interests. In a nutshell we need to make an assessment of global effect independently based on specific effects other than citing environment and security is inseparable¹⁸.

Internationally, there is manifestation of rapid environmental changes as a result of deforestation for example where future climate change are very uncertain, and any analysis of adaptation to this future climate change needs to take these uncertainties into account¹⁹. The uncertainty of climate does not justify complacency, since future climate change is still expected to further increase the climate variability to Kenya and the whole world²⁰. Generally, Kenya and its neighboring countries according to climate projections, there is a likelihood to experience hotter and wetter weather conditions in future where there is also a threat to National and international peace and security²¹.

The existing literature shows that environment degradation is a risk to security and therefore it is important to securitize environment²² this can be realized through setting specific solutions to specific threats. At the same time most of the researchers

¹⁷Jessica T., Matthews. "Redefining Security" vol 68, No. 2, 1989. Pp 162-167.

¹⁸ Ibid 19

¹⁹IPCC. "Climate Change: Impacts, Adaptation and Vulnerability." Cambridge. Cambridge University Press. 2007.

²⁰ AEA. "Technology PLC. Kenya: Climate Change Screening Information and Change". London: DRID 2008.

²¹ Ibid 22,

²² Nina., G. "Environmental Security" Vol. 33No 1 1996. PP 109-116. Sage Publication.

do not offer authentic solutions but vague solutions like use of more money in environmental protections as well as reforestation. Increase of foreign aid for environment, trade liberalization as well as discourage corruption²³ so that environmental protection can be realized.

At the same time environmental degradation undermine national goals of environmental protection. This means that situation of security by undermining the natural support system on which all human activities depends²⁴. This given scenario implies that ancient concept of National security is not acceptable in favor of a more comprehensive and integrated *view which takes environmental harm into account, all the human society is at risk*. Moreover examination of individual environmental problems cannot be underrated and individual too are supposed to take adequate measures which are required and it takes in global environmental protection as a fundamental for national security.

Some scholars agree that, for environmental degradation to be a security threat there must be indications relationship into the following areas: humanitarian concerns, regional and local stability, public health and human lives²⁵ just to mention a few. At the same time, environmental challenges are related to national interests either stated or spelled out. This means that relationship of national interests is associated with a certain measure to counter the vice of environmental degradation especially sustainable development and poverty. One of the tentative argument from the researcher is that different actors have different interested on environment and this affect them and the rest severely because the effects have security implications. Moreover, security

²³ Ibid 22.

²⁴R., Michael. National Security. "The economic and Environmental Dimension World watch Institute paper". Washington D.C. 1989.

²⁵ Myers., N. "Environmental and Security". Foreign Policy No. 74 PP 23-41, 1989.

problems do not impact assessments and analysis of environmental degradation therefore security is a protective measure to national interests and goals.

1.7 Conceptual framework

The researcher will take the form of resource Curse theory and Nature/Nurture theory. In Resource Curse theory, it shows how the population growth and scarce resources are being depleted hence becoming a scarce of both local and global conflict as well as insecurity in the modern age as it was indicated by Homer Dixon. The resource scarce theory states that the increased scarcities of natural resources, decline of biodiversity as well as deterioration of forests cover. Dixon foretells that the future generation will be severely affected by the environmental degradation which will affect the well-being of population as a result of climate change and food security. This theory states that scarcity of resources will lead to violent conflict in developing nation where Kenya is in this category and confronted by this opinion where we have witnessed civil unrest in Mau Complex, fighting for green pastures from pastoralist communities as well as agricultural farming. This implies that the conflict in Mau began as a native issue but escalated into ethnic, sub-ethnic, national and international issue. The theoretical interpretation of this is that poverty has incapacitated population to protect themselves from environmental degradation thus creating a social disorder and crisis. Due to degradation of natural resources and especially the environment has suffered severely to access the natural resource as environmental resources which are scarce.

1.7.1 Nature/ Nurture

Nature means that something has a potential to happen and there exists potential for it to exist. Environmental degradation, conflict and violence are inherent in society

and they are endemic. This theory states that human beings are aggressive and violent in nature while the poor are dominated by the fortunate in the society. As violence is inevitable people strive to transcend and as a result of evolution there is a capacity to move to protected areas to meet their basic necessities and after getting this transcend to the next level. Whether applying genuine means or violent means.

Nature means that an event will occur. At the same time it states that for an event to occur has to depend on one another and triggered by other concepts like decision making, oppressive regimes. Human being are not violent it is poverty and scarce resources which make civilian aggressive and more so in the situation where they find themselves in. The use of force to evict the population in forest creates conflict as a result of use of repression despite use of use of diplomatic etiquette like accommodations and negotiations to see how the population can be resettled elsewhere.

1.7.2 Resource Curse Theory

There is another name of this theory which is paradox of resources. This given theory indicate that some of the communities which have access to abundance of natural resources like forest, rangelands, land and water seems to be less developed in terms of economic costs and growth compared to areas with less access to natural resources. The implication here is that there are a number of factors which promote the decline of these resources for example poverty, population growth industrial development as well as competitiveness of these resources for economic growth where some are traded in overseas, volatility of income from these natural resources as well as structural violent and conflict perpetuated as a result of poor management of these resources, struggle to access, weak government institution in dealing with corruption in

access of these resources. This theory may not be global but with abundance access of natural resources, many countries and communities in Kenya is a reality²⁶.

This theory was first launched by Richard Auty in the year 1993 where he explained the way different countries with rich in natural resources were unable to embrace the pride of their wealth and be boastful of their economic growth, and counter-intuitively of countries and communities with less economic growth compared with communities and countries with abundance access of these natural resources²⁷. There are so many studies conducted with direct interlink age of access to natural resources, wealth, population growth and violent conflict, poor economic development and growth. The displeasure between access to natural resources with population and growth, clearly manifest itself in construction industries, rural electrifications using posts from Mau complex, drying up of rivers that feed pastoralism and fishing industries. At the dawn of this millennium the precipitations has declined due to environmental degradation especially deforestation and logging. This threaten security of citizenry as well as some of the government funding being taken to special program to counter the effect of environmental degradation where access to resources is seen as a curse²⁸.

1.7.3 Relevance of this study

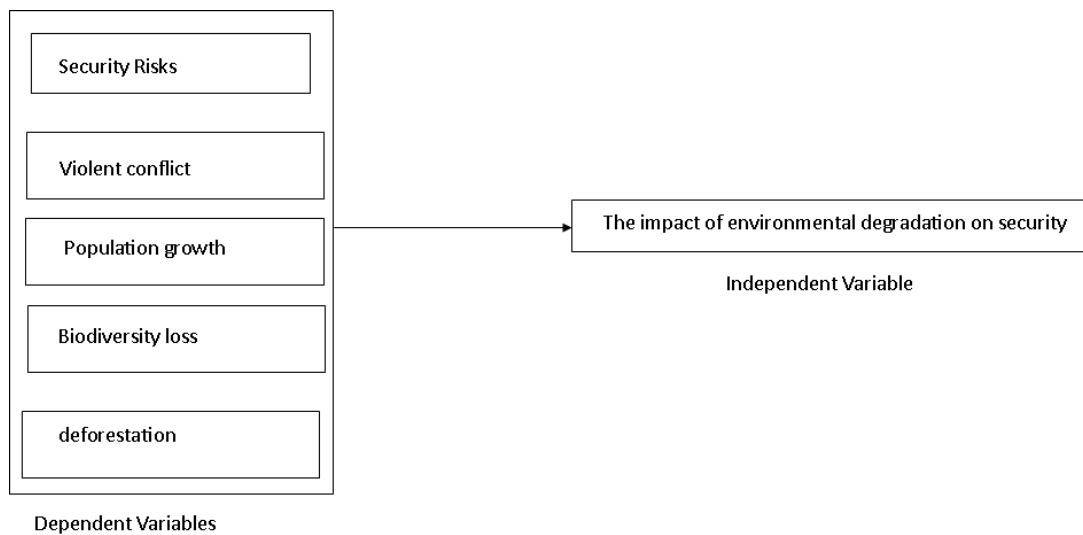
Nature/nature and resource curse theories are the best suited theories that could ascertain on what is happening in Mau complex on the impact of environmental degradation and security. Mau complex and it has been explained by the above two

²⁶ Jeffrey Sachs, D; Warner, Andrew M. "Natural Resource Abundance and Economic Growth, NBER Working Paper 5398, 1995-02-02". Retrieved from <http://ideas.repec.org/p/nbr/nberwo/5398.html>. Last accessed on 16th January 2016.

²⁷ Richard M. Auty. "Sustaining Development in Mineral Economies: The Resource Curse Thesis," London: Routledge, 1993.

²⁸ S. Djankov; J.G; "The Curse of Aid" Journal of Economic Growth (Springer) 13 (3): 169-194, doi: 10.1007/s10887008-9032-8,2008.

theories as a water tower is rich and abundance of forest resources as well as regulator of air but due to poor governance where some colonies were rewarded by the former regimes facilitated to the destruction of Mau Complex thus hindering economic social development. The three successful governments in Kenya were not in a position to come up with appropriate land policy, mechanisms to counter the population growth as well as unemployment. Mau being a multicultural environment is not in a position to diversify her resources so that there can be peace and harmony in the communities living around there.



The above model explains key variables which will guide the researcher in the research process.

1.7.4 Hypothesis

1. Population growth does not give a separation of environmental degradation, security and violent conflict.
2. Environmental degradation seems to be a key regulator on security, violent and structural conflicts in different levels of the society.

3. Violent conflict has negative implications on native security, economic and political stability.

1.8 Methodology of Research

My research will take the form of a mix-method kind of research. As the primary objective of this study is to investigate environmental degradation and its impacts on human security, the researcher will design a questionnaires distribute them to his study sample population and get feedback. It is also the intention of the researcher to rely with officials from Ministry of Environment and Natural Resources as well as parastatals like Kenya Forestry Service conduct an interview Greenbelt Movement will also be given serious considerations. The questionnaire will be tentatively consisting 20 questions with five respondent options that are excellent, very good, good, poor and very poor. The feedback will be analyzed and tabulated by the use of simple computer application which is MS Excel and standard software.

It is also important for the researcher to visit consultancy firms for environmental objectives. In the final analysis, the data collected will be tabulated in the form of data tables with the help of Statistical Package for Social Sciences (SPSS). Ethical considerations will be taken seriously as the researcher will inform the respondents that this is for research only.

Focus group discussion where the researcher intend to visit Mau complex develop hypothesis by looking the knowledge of the participant on that given issue which the researcher is investigating. At the same time, it will be accompanied by observation, interview as well as observations. Data will be also tabulated with the help of SPSS. All the data that will be collected for this research will be primary in nature where researcher will visit ground and offices related to his subject.

1.9 Research Design

The research will take the form of a mixed method. This study will be a cause-effect comparative case study of Mau Complex. As the primary objective of this study is to examine the link between environmental degradation and violent conflict in Mau forest complex, the researcher will administer primary and secondary data to approximate sixty (60) respondents/ participants and get feedback from them.

1.9.1 Primary data

The researcher intends to visit Mau Complex to collect data through questionnaires from locals, political leaders, administration, forgers wanders as well as any other relevant field related to the researcher area of study and he deemed necessary for data collection. This set of questionnaire will be distributed to the study sample population. It is also the intention of the researcher to conduct interview to officials from the Ministry of Environment and Natural Resources, NGOs like Greenbelt movement, parastatals like National Environmental Management Authority (NEMA). At the same time, the researcher will give focus group discussion to a group of minimum of two and a maximum of fifteen. This means that simple sampling and purposive sampling will be used in selecting the participants in the interview. The questionnaire will be tentatively consisting of ten questions with two respondent's options that are YES or NO and a room of explanation. The feedback will be tabulated by use of simple computer application which is MS Excel and standard software.

With the consideration of focus group discussion the researcher will visit Mau complex, develop hypothesis by looking the knowledge of the participants on that given issue which the researcher is investigating. At the same time, it will be accompanied by observation and interview. Data will also be tabulated with the help of

Statistical Package for Social Sciences (SPSS). All the data that will be collected for this research will primary in nature.

1.9.2 Secondary data

For secondary data, the researcher will rely mostly on the current literature especially in environmental documents and documentaries, academic journals, policy oriented document especially Vision 2030, periodicals and books. It is important for the researcher to visit consultancy firms with environmental objectives. In the final analysis, the data collected will be tabulated inform of data tables with the help of SPSS. Ethical considerations will then be given considerations as researcher will inform participants that this is for the research only.

1.10 Analyzing data

The researcher, with help of thematic analysis and SPSS after going to the field, get the raw data will use mix-method so as to examine the link between environmental degradation and violent conflict in Mau forest complex. This mix method means that both qualitative and quantitative analysis will be used. For qualitative analysis thematic analysis will be demonstrated leading to a composing variable. For quantitative data, statistical style, graphs and charts will be demonstrated. This will help the researcher in giving out an authentic conclusion on the link between environmental degradation and violent conflict in Mau complex. Other statistical tools to be used are for example ratio measurements.

1.11 Research ethics

As this study will be correctional in nature which means a certain variable is causing the other variable, the researcher will employ ethical consideration in research with utmost respect so as to make sure that reliability of research is achieved. Validity

of data and more importantly observe confidentiality from the participants and explain to them that, this research is for academic purposes only. The learner will inform the respondents confidentially will be observed woolly and he will not force participants to the research endeavor.

1.12 Scope and limitations of study

The researcher could not manage to interview either principal secretary or cabinet secretary in the Ministry of Environment and Natural Resources on the impact of environmental depredation and security in Mau complex. This is as a result of tight schedule with in the ministry. However, the researcher made progress by having interview with key government officials and policy makers whom he could have access with them. The researcher also found it difficult to generalize the result because they are collected in Kenya where an effect of environmental degradation is a global one. On top of this, the sample was not representative of the oral population in the entire study. This means that the learner has to dig deeper on the current literature to strengthen understanding on environmental degradation on Mau complex. On top of this, this study concentrates on causes, impacts and violent conflict based on environmental degradation.

1.13 Chapter outline

This study is arranged with five chapters as explained as follows

Chapter one is the proposal with the following subheadings, introduction, background of the study, statement of the problem, general objective, specific objectives, research questions, justification of study, literature review, conceptual framework, conceptual model, hypothesis, research methodology, scope and limitations of study and chapter outline.

Chapter two incorporates overview of environmental degradation and violent conflict in Mau complex. It examines causes, impact of environmental degradation efforts made by several actors to counter environmental degradation. On top of this it takes into consideration responsive processes on the way environmental degradation is contributing to insecurity and slows economic growth thus increasing level of poverty and violent conflicts.

Chapter three in this chapter the researcher will begin analysis of environmental based conflict interwoven with, population, and mineral resources infrastructure gender differentiated environmental impact and natural disaster on the economy in Mau complex. In this regard, the learner will capture the general overview of environmental degradation in Mau back to the colonial era. Severe environmental degradation with population growth as well increase of poverty, unemployment level thus leading to desertification and aridity and thus threatening livelihood of the population.

Chapter four will attempt to make assessment of key causes of environmental degradation and the way they impact slow development of economy and trigger violent conflict will be looked into. At the same time the theory of resource curse will be examined in the nature, nurture in Mau complex.

Chapter five will contain the summary, conclusion and recommendations of this study.

CHAPTER TWO

OVER VIEW OF ENVIRONMENTAL DEGRADATION AND VIOLENT CONFLICT

2.1 Introduction

In the developing world, management of land and other natural resources pose the most challenges in our times. This can be traced well after independence especially in Kenya and this is when the documentation of history could start to be traced. As a matter of fact, the natural resources have to be exploited and in the process of exploitation especially to the high value natural resources like timber oil just to mention a few. In the process of their scramble they do generate violent conflict. At the same time, due to the growth of population, there is high competition of these declining resources which trigger violence in the process of acquiring them.

Moreover, as per the existing literature it is not only population growth that leads to environmental and violent conflict, there are other factors like climate change, weak or poor governance/ regimes. Without proper mechanisms to the management of the environment, new modes of conflicts will be experienced and barricading the existing peaceful means of conflict resolutions. This chapter will capitalize on the link between environmental degradation and violent conflict in Mau complex. More importantly carefully examines causes and effects, violent conflict as well as various efforts made by different agencies to curb environmental degradation. At the same time, environmental security will be explored and find our similarities between environment and conflict.

2.2 An over view of Mau forest complex

Mau forest is one of the largest complexes comprising approximate area of 273,300 hectares. It serves as a water catchment area of 12 major rivers in western Kenya²⁹. Its recent degradation has posed both social and developmental challenges that are characterized by both direct international and direct intra-national conflicts. This has derailed food production, animal rearing, infrastructure gap as well as low manufacturing capacity³⁰. Moreover this is quite ironical as a water catchment area which is not only locally driven but also international driven confronted by security and development implication³¹ regardless of its natural resources as well as outstanding of environment which end up in violent conflict in the process of scramble of environmental resources.

Moreover, encroachment in Mau forest has threatened several social pillars of the economy like pastoralism, tourism and agriculture. For example tourism has suffered a setback following the drying up of rivers like Mara River³² which is a hub of wild beasts and other wildlife. The implication here is that some of the communities which practice agriculture are accused by the communities which relay on tourism for their livelihood. The accusation leveled against them is as a result of destroying forest for agriculture practices which hinder and threaten environment through desertification.

Many other factors like population growth, underdevelopment, poverty level and unemployment trigger environmental degradation in Mau Complex thus threatening human security. This is because of the Post-Colonial governments were not

²⁹ Africa Policy Report, "Fighting for the Mau Forests: Land, Climate Change and Politics of the Kibaki Succession". Africa Policy Institute, June 2010.

³⁰ United Nations Economic Commission for Africa, "Africa Remains Hungry Despite \$3 Billion annual Food Aid and \$33 Billion on Food imports." ECA Press Release No 11/2010.

³¹ Transparency International, "Corruption Perception Index 2014. Full Tables and Rankings. Last accessed on January 2016 from <http://www.transparency.org/cpi2014/results/>.

³² Africa Policy Report, "Fighting for the Mau Forests: Land, Climate Change and Politics of the Kibaki Succession". Africa Policy Institute, June 2010.

in a position to adequately address the question of joblessness and landlessness³³ at the pretext of the growing population. For security purposes, gross abuses of human rights have been manifested through maiming, killings and deportation of some citizens especially in 1992, 1997 and 2007 post-election violence. The implication here is that environment is a clear indication and demonstration that environmental degradation has been used to perpetuate violent conflict. Moreover this is where some communities evicted in the neighborhood labeled as aliens for example kikuyu and this has perpetuated emergence of militia groups like Mungiki³⁴.

2.3 Causes of Environmental Degradation

We are living in a global system manifested by separate culture, social, political economic and territorial order. In this regard the concept of environmental degradation, violent conflict and security circumscribed to both inter-state and intra-state. In return this threaten environment and to some extent some political leaders using violent conflict thus becoming most actors and perpetrators of violence. This international system is questioned and threatened by both deadly short-term and long-term³⁵violent conflict.

Causes of environmental degradation on security are varied and complex. However there is a critical variation in the casual factors in Mau Complex based on violent conflict and environmental attack. In this regard, the causes could differ depending on the historical period, political undertones as well as geographical location. Therefore, the researcher will look in to causes in three categories and this is possible causes, structural and trigger causes of environmental degradation on security.

³³ Ibid 4.

³⁴ Kantai, P., "Saving Kenya's Mau Forest" Africa Report 21st September 2009.

³⁵Ibid 6.

2.3.1 Land disturbance

The current population disturb environment in several ways which contribute to environment degradation. This is mostly done in rural areas where 75% of population of the world's poor is in rural areas and in most cases they do engage themselves in simple domestic chores to get their livelihood like peasant farming³⁶. The implication here is that due to population growth food production is not sufficient to sustain the growing population and hence people have to encroach into forest and other protected areas to look for a means of livelihood and other basic necessities. Moreover huge population into Mau Complex and other protected areas, people are still confronted by malnutrition and hunger as a result of inequitable consumption and distribution³⁷.

Without any prejudice, agricultural production must be embraced to ensure that strides made in population growth go UN wasted. The implication here is that modern production techniques should be invented which are environmental friendly and transform conflict³⁸. Usually, available literature demonstrates that theory of inter and intra states, territorial disputes contribute to violent conflict especially when the concept of land is mentioned³⁹. This means that environment is the basis of commerce, navigation and civilization as vast reservoir of resources both living and non-living⁴⁰.

According to UNEP, 70% of earth's surface is covered by water and if the water catchment areas will be destroyed this will hinder the development which is perpetuated through water especially tourism industries. At the same time due to environmental degradation of Mau, fishing industry has been affected as a result of

³⁶Africa Policy Report, "Fighting for the Mau Forests: Land, Climate Change and Politics of the Kibaki Succession". Africa Policy Institute, June 2010.

³⁷ibid

³⁸ibid

³⁹ Agnew, J., "The Territorial Trap: The Geographical Assumption of International Relations Theory". *Review of International Political Economy* 1(1): 53-80. 1994.

⁴⁰ See "<http://www.archive.org/stream/democraticideals00mackial#page/2/mode/2ups>". Last accessed June 2016.

drying up of the tributaries of lake Victoria for example Nyando and Sondu just to mention a few. According to ministry of environment and Natural resources estimates that volume in which environment is disturbed grew by 1000% from 1963 to 2000⁴¹. This means that a third of Mau complex resources have been degraded and destroyed at the pretext of population growth hence this population cannot feed itself.

In addition, land cultivation where it is trough cultivation the population is in a position gets both cash and food crops to sustain themselves. In Kenya up to a population of 56% depend on agriculture for livelihood. Due to encroachment in forests and environmental degradation there has been reduction of agricultural produce and more importantly land which is a water tower and transferred to agricultural practices. More over at the dawn of the new millennium, the prospects of minerals and hydrocarbon exploration and exploitation has been at the core of a number of Multi-national Corporations (MNCs) and Kenya is not left behind.

This means that environment and to be specific land is depicted as a strategic for economic resources⁴². As a result of this significant UN and other Regional bodies have not come up with mechanisms rules to regulate the exploitation of resources from and use of land⁴³. Without any prejudice, MNCs has given an indication of the role they play in job creations and wealth and more so in sustaining human life. The implication here is that this is supposed to be done in consistence in environmental protection and less poisonous more so to water catchment areas⁴⁴.

⁴¹ GoK, "Kenya Threshold 21 Model Integrated Climate Change Adaptation and Comprehensive National Development Planning In Kenya". Nairobi, Ministry of Environment and Mineral Resources, June 2012.

⁴² Mike, L., & Utley, M., "Traditional & Innovation in Environmental Thinking. The Changing Face of Environmental Power". Macmillan Press, Basingstoke, 1999.

⁴³ Shaw, M. N., "International Law (4th Ed)". Cambridge University Press, 1997.

⁴⁴ Smith, D., & Vivekanda, J., "A Climate of Conflict: The Links Between Climate Change, Peace and War". International Alert, London, 2007.

As a matter of fact, environment influences politics of this country as well as international relations among other states⁴⁵. This means that if there is good order that is maintained at water towers, land will become a prerequisite to peaceful co-existence among ethnic communities and inter-states. So far in 2009 at Copenhagen that were demanded to look into water towers. Being a domestic affair was not only affecting Kenya alone was Mau complex become a topic of discussion in international organization⁴⁶ so it can address menace of climate change⁴⁷. This provided for an international mechanism to given state an environmental degradation and climate change. However, land disturbance have disturbed the good order of environment.

Challenges posed by the recent land disturbances in environmental degradation at Mau complex is an additional to the existing security challenges already confronting Kenya and this region in general. Mau complex is one of the most volatile spot, insecurity, and land disturbances in Kenya before 2009. Many of the ethnic communities living around Mau complex do suffer from protracted political strife, this stems from economic activities carried out by different communities⁴⁸. For more than 50 years, Mau complex has also been threaten a theater of strategic political power struggle where some communities demand control of land for example the agriculturalist and any attempt for example pastoralist to control it, confrontation erupt casualties will manifest itself through maiming of population, killing and inhumane acts⁴⁹.

⁴⁵ Report of the Judicial Commission Appointed to Inquire into Tribal Clashes in Kenya (Akiwumi Report), Government press, Nairobi Kenya, 1999.

⁴⁶Africa Policy Report, "Fighting for the Mau Forests: Land, Climate Change and Politics of the Kibaki Succession". Africa Policy Institute, June 2010.

⁴⁷ See http://www.un.org/ga/64/generaldebates/pdf/KE_en.pdf. Last accessed May 2016.

⁴⁸ See Standard News Paper, 18th December 2009; Ruto: Raila Insensitive, Vengeful against Kalenjin Community- Vitalis Kimutai.

⁴⁹ See Crisis in the Horn of Africa available at "<http://hornofafrica.ssrc.org>". Last accessed on May 2016.

2.3.2 Marginalization of pastoralist communities

Etymologically speaking, pastoral activity is seen as a lesser economic activity as opposed to other economic activities like agriculture. The implication here is that communities like Maasai feel impoverished and marginalized especially during drought period and there are restriction not to graze in water catchment areas and other protected areas. The implication here is that conflict will manifest itself as this community is looking for a means of livelihood and there is a policy to protect the forests and other catchment areas. Moreover degradation will perpetuate conflict as some communities fight for space for their economic activities⁵⁰. After the defeat of government in 2005 national referendum on the new constitution, different communities started to align themselves based on their economic way of life for example Maasai were pro-eviction of people who have encroached Mau forest so that forest can be restored and support their pastoral activity. On the other hand; some communities like Kalenjin's recommended prudence in the way in which eviction of squatters will be carried out, process of resettle them and at the same time compensate them before the eviction process⁵¹.

This heated debate between different communities which was even deliberated in National Assembly in year 2009. Several Members of Parliament (MP) aligned themselves too on the basis of their economic way of life. The implication here is that degradation of water towers will be hash on economic factors of any people and as a result of its degradation many will starve, loose jobs opportunities and thus adding to the poverty that already exists in most parts of the country. Moreover the deteriorating use of concept like marginalization puts security at risks especially where people will

⁵⁰ Mau Report Up for House Debate; Daily Nation, 30th August 2009.

⁵¹ Lonergan. S., "The Role of Environmental Degradation in Population Displacement-Environmental Change and security project Report." Issue 4, 1998, 5-15.

use unlawful means like encroaching into forests and use this as a means to earn their livelihood.

At the same time, the collapse of some parastatal like Kenya Meat Commission (KMC) also caused wide spread environmental degradation and rivalry between different ethnic communities particular in Mau complex. This means that the small parcel of land has to support the growth of cattle industries and it also scrambled by agriculturalist too. As a result, some people will pursue illegal means to generate their wealth so that they can support their growing population⁵². The rampant poverty as well as global⁵³ economic recession which confronted us at the dawn of this millennium ensued that different regions offered different incentives for both individual and communities to engage themselves in illegal means so that they can realize their livelihood⁵⁴.

2.3.3 Rapid Urbanization and Globalization

In the modern world, rapid urbanization have manifested to environmental degradation and with the emergence of territorial security. From international political system school of thought; globalization as a process is facilitated by the liberalization of market, Trans boarder transactions by the devolved of states sovereignty⁵⁵. As a matter of fact, globalization has provided and facilitated mobility of labor capital, technology, ideas and profit across the given country and region where Mau complex is not left behind.

⁵² Ibid 22.

⁵³ Collier, P., & Gunning J.W., "Explaining African Performance Journal of Economic Literature", Vol. 37; No 1 (1999) p. 74.

⁵⁴ Ibid 23.

⁵⁵ Saadia, T., "The Boundary Politics of Independent Africa". Cambridge, Mccs: Harvard University Press, 1972.

Real estates, construction of modern houses has caused destruction of environment through the land as people dig foundations for house building and at the same time deforestation is carried out to look for raw materials like timber. The modern houses created by globalization facilitate a room of environmental degradation at the same time trees are destroyed to look for fuel like charcoals to support this urban population. However modern house constructions are based on the success of globalization⁵⁶.

2.3.4 Interference by Foreign Powers

The interference of political system by foreign powers cannot go unnoticed where some of the political powerful states led to a distorted and degradation of environment. Some of the powerful countries in the world like European Union and USA can be depicted as strongman states that are found in meddling in Mau complex politics⁵⁷. Where some other nations like china and African Union (AU) were not aligned to any part of the political divide⁵⁸, this hindered urgent eviction of the illegal squatters as well as acrimonious taskforce for foresee the restoration of Mau complex and this contributed and complicated capacity of Kenya for effective environmental protection⁵⁹.

This kind of international interference triggered conflict where some of the allied nations were willingly to contribute funds for upgrading and restoration of Mau Complex. At the same time the 23 EU were demanding that some *key politicians, civil servants and untouchable businessmen in the current and previous regimes to surrender their illegally acquired land in Mau to facilitate effective rehabilitation of*

⁵⁶ See "[http:// www.istihad.org/global](http://www.istihad.org/global) terror. Htm last accessed 21st June 2016.

⁵⁷ Africa Policy Report, "Fighting for the Mau Forests: Land, Climate Change and Politics of the Kibaki Succession". Africa Policy Institute, June 2010

⁵⁸ Ibid 29

⁵⁹ American Foreign Policy, 2009.

*Kenya's leading water tower*⁶⁰. This did not only affected the target people who were powerful in present and past government, but this threatened the security of some civilians like minority *Ogiek* community which lives in forests and they depend on hunting and gathering for their livelihood.

2.3.5 Ethno-nationalism

The expression 'ethno-nationalism' can be defined to a politicized group affiliation based on certain traits like traditions, religion, ethnic group, race, color, race clan or tribe. These traits define 'people' in their minds as its members⁶¹. This insinuation shows that there is segregation which manifests itself to the people of Mau Complex. As a matter of fact, this can be seen as a primary cause of ethno-nationalism on environmental degradation. The implication here is that a sizable minority in population in Mau complex seems to be systematically deprived of their rights in access to forest resources especially social, economic and political opportunities.

In return some of the communities are obstructed from expressing their cultural way of life for example pastoralism and agricultural or excluded from political influence, this facilitates state of insecurity from segregated communities and gives rise to secessionist movements that may turn to violent conflict as well as other violent means of struggle⁶². In the end, ethno-nationalism is more likely to justify that environmental degradation than the moderate inclusive population.

⁶⁰Africa Policy Report, "Fighting for the Mau Forests: Land, Climate Change and Politics of the Kibaki Succession". Africa Policy Institute, June 2010, p.29.

⁶¹ Oxford Advanced Learners Dictionary 9th Edition, 2010.

⁶² Stoddard, A., "ethno nationalism and failed states: source of civil state fragmentation in the international political economy available at http://www.diplomaticonline.com/pdf_files/npsia/volume%203%20archive%202002%29.pdf. Last accessed June 2016.

2.3.6 Poor governance

The cause of environmental degradation and democracy poses a severe challenge to the successive regimes in Kenya since 1963. Generally speaking some concepts like rule of law, civil liberties and democracy are a precondition for forms of environmental degradation⁶³. As a matter of fact most of the democratic societies have the lowest levels of opposition violence. These are first world countries like America, Britain and Germany just to mention a few. At the same time they have the lowest levels of oppositional violence⁶⁴.

Ironically developing nations and most of the African states are regarded as weak nations and they lack capacity, will to exercise territorial control and protection of water towers⁶⁵. In this case Mau complex is not in isolation. Without any prejudice, in most cases this leaves power vacuum that can be exploited by communities in search for livelihood, maximizing capitals from MNCs especially those dealing with construction industries. However, this should not be seen as a lack of democratic processes. As a matter of fact, long standing democracies like USA and China have been accused of not obeying some of the international regimes like Kyoto protocol and Montreal Protocol⁶⁶.

2.3.7 Political Instability

Political instability contributes directly to environmental degradation. The political instability that proceeded 2005 National referendum of the new constitution as

⁶³ Bassi, A., "Review of Impacts of Climate Change in Africa: Kenya". Washington Millennium Institute, 2010.

⁶⁴ Esty et.al, "working papers: state failure Task Force Report and Esty et.al, State Failure Task Force Report: Phase ii findings.

⁶⁵ Kaplan, R. D., "The Atlantic Global Coming Anarchy: How scarcity, crime, overpopulation, tribalism and disease are rapidly destroying the social fabric of our Planet". Last accessed on December from [http:// www.theatlantic.com/magaine/archive/1994/02](http://www.theatlantic.com/magaine/archive/1994/02).

⁶⁶ Class Notes "Theory of International Relations" First Semester Sep-Dec 2014, IDIS, UoN.

well as 2007-2008 post-election violence had definite bearing on the increased environmental degradation⁶⁷. As a matter of fact amalgamation of political instability and poverty makes population to entirely rely on protected areas where country is not in position to defend its water tower wholly. Similarly lack of proper land laws, division as well as national land commission has greatly contributed to environmental degradation by people encroaching into water towers. Before the promulgation of the constitution in 2010 and the debate of Mau taskforce generated acrimony along tribal lines on Mau complex restoration⁶⁸.

Moreover political instability leads to the proliferation of Small Arms and Light Weapons (SALW), warlords and most importantly militia where the fragmentations of the country into scramble of the remaining natural resources. Despite of having a standing and steady army in Kenya, police service, when disaster occur they are engaged in humanitarian acts other than offering security⁶⁹. The implication here is that water towers will become a national security as well as environment where military have to use their military apparatus and testing them which in the end destroy the environment.

2.4 Trigger Causes

As a matter of fact, the first condition which can be considered a direct cause of environmental degradation is the existence of grievances among an identifiable community in Rift valley province. There are for example some ethnic communities discriminated by others especially to revenue collection before the promulgation of

⁶⁷ Lynch, G., "Counting the Kalenjin: The failure of Dynastic and the strength of the ODM wave in Kenya's Rift valley Province". *African affairs*, 107/429, 2008, p 514-568.

⁶⁸ Gakuu, M., "Could Rebellion and Mau saga be Raila's water lord?" *The standard News Paper*, 3rd January 2010.

⁶⁹ Myers, N., "Environmental Exodus: An Emergent crisis in the Global Arena". Washington, D.C. Climate Institute. 1995.

the constitution. This is not to say, however, that the existence of a dissatisfied community necessarily engages in environmental degradation. The second conditions that can create motivation to environmental degradation are the lack of political opportunity and participation. The implication here is that structural factors involve the causes of environmental degradation and this precipitate outbreak of tribal wars.

The general assumption to the fact that violators of environment are usually unpredictable, a common pattern has emerged with highlights of particular activity, for example deforestation where some of this are exported to other countries. In this regard environment retaliations will occur as a result of unusual and unexpected emission of carbon and this is because forests acts as carbon ‘sink’⁷⁰. In general, proactive activities that are conducted by the growing population will trigger desertification and aridity across all the sectors of the society.

2.5 Impact of Environmental Degradation on Security

For the sake of this research work, impacts of environmental degradation will be categorized in three main areas as follows: behavioral, direct and response impacts;

2.5.1 Direct Economic Impacts

On the flip side of the causes there are impacts of environmental degradation which are gathered from the field. The above three cuts across all the sectors of the growing economy. At the same time, this category witnessed economic damage done by severe flooding through destruction of building and infrastructure like roads and ending productive live especially in Nzoia river which has its source in Mau complex. These mentioned losses are as a result of human activity through disturbing nature and

⁷⁰GoK, “Kenya Threshold 21 Model Integrated Climate Change Adaptation and Comprehensive National Development Planning In Kenya”. Nairobi, Ministry of Environment and Mineral Resources, June 2012.

although Kenya has not reached there, it is similar to natural calamities like Hurricane, Rita and earthquake like Tsunami.

These direct economic impacts, despite the economic progress, the environmental degradation will increase extreme poverty. In this regard, department of special program in the office of the president, will be involved in relief and resettlement of the population displaced by these natural occurrences. More so, more money will be induced in construction of dykes to prevent flooding. At the same time, security will be threatened as a result of diversion of their mandate to construction like bridges and their maintenance as well as water towers.

2.5.2 Tourism Industry

In Kenya this is one of the sectors which bring good revenue to Kenyan government. This is because it is a tourist destination which attracts good tourists. The government had a blue print in 2012 to receive at least 2 million tourists in Kenya per year⁷¹. According to the economic survey that was conducted by the Ministry of planning and vision 2030 in 2012, the following figures can be deduced from the revenue that was collected from the tourist sector 97.9 billion in year 2011 from 73.7 billion from the previous year⁷².

Despite this tremendous growth of tourism, sector environmental degradation has posing new security threats to this industry and this is for example the proliferation of refugee associated with flooding of displacement of population. At the same time, the growing population is confronted by the diminishing of natural resources thus affecting wildlife population and recently we have witnessed wildlife leaving habitat and creating a conflict with human population and 'Mohawk' was killed. Moreover,

⁷¹ Gok, "Foreign Policy", Nairobi, 2012.

⁷² Economic Survey, 2012.

destruction of Mau complex will make wildlife to suffer and migration will manifest itself as a result of drought in search of pastures in the neighboring countries like Tanzania. More so, this will create a Trans boundary conflict as well as loss of biodiversity.

2.5.3 Agriculture

This is the backbone of the Kenya's economy. Through this we rely on agriculture sector for Gross Domestic Product (GDP)⁷³. At the same time, agriculture contribute to the realization of food security as 80 per cent of Kenya's population lives in rural areas and for the sake to their livelihood and sustenance they do depend on agriculture⁷⁴. At the same time, it is only 20 per cent of Kenya's total land area which is suitable for arable farming⁷⁵. The implication here is that the rest which is 80 percent of the total land area of Kenya is either arid or semi-arid and this is not suitable for agricultural practices. For the country to sustain the growing population, with food, issues of technology and value adding are supposed to be considered without degrading the environment.

However, this is not the case and degradation of the Mau complex has contributed to low agricultural production, which is contributing to the change of precipitation patterns as well as variability. Moreover, there will rise in temperature which will be the basis of increased crop diseases and infections of crop pests. Despite this, some of the areas have received bumper harvests in Mau forests as a result of rise in temperature precipitations which is a small portion and this is not sustainable.

⁷³ DFID. "Economic Impacts of Climate Change: Kenya- Rwanda, Burundi". Oxford: ICPAC and Sei. 2009.

⁷⁴ El-siddig, E. "Impact of forests degradation in livelihoods. Retrieved from <http://www.povertyenvironment.net/node1728>. Last seen on June 2016.

⁷⁵ Ibid 46.

2.5.4 Urbanization

In both rural and urban areas, energy is key for the sustenance of population. In Mau complex, deforestation has been carried out as a result of high demand of energy in urban cities. More so, logging of timber which has led to depletion of forest cover. Also in rural areas timber and firewood are used as source of energy. The implication here is that the sub-Saharan Africa 80 percent of total energy used is derived from forests and other related biomass⁷⁶. Moreover, approximate 50 percent of Kenya large cities in one way or another rely with catchment areas for water supply⁷⁷.

Urbanization is taking place in an alarming rate in Kenya and this is evident in the declining of Mau products to cater for this growth through illegal logging as well as unsustainable human settlements. The security will be threatened through carbon dioxide (CO₂) release to the atmosphere and this will hinder carbon dioxide storage⁷⁸. Security wise forests act as center for struggle and testing of apparatus. In Mau complex localization of violent conflict manifest itself through territorial and territory proximities. In a nutshell, forests do not trigger, cause or contribute to violent conflict but resources that are within the water tower are fought over from time immemorial. More so, the 'lootable' resources like electricity posts escalates conflicts into a higher note and this is because cutting of the posts require low skills and not only machine even house hold tools like axe can be used to conduct this activity.

⁷⁶ UNEP, "Reporting forests: A Journalist Guide to the Role of Forests in Sustainable Development and Human well-being". UNEP, Nairobi, 2011.

⁷⁷ Ibid 48.

⁷⁸ FAO, 2006.

2.5.5 Fishing and other Marine Resources

Environmental degradation does have severe impacts on fishing sector. This is for example, drought and temperature variability do affect the livelihood of civilians. According to reports compiled by UNEP, almost 70 percent of globe is covered by water and approximate 25 percent of world's population also depend on fish as a source of protein⁷⁹. The implication here is that, the livelihood of most of Kenyans who rely on fishing from Lake Victoria will be affected and at the same time due to competition, reduction of fish stock will be experienced and this will cause violence. Moreover, this will escalates the already existing security challenges from other sectors where different people will demand restoration of Mau for their livelihood.

At the same time, illegal fishing will manifest itself and this will contribute to overexploitation of fish stock and seriously affecting the sustainable management of Lake Victoria. Moreover according to economic survey, aquaculture⁸⁰ has increased and despite this increase, jobs have been crated and mostly those of economic merit but the environment has suffered severely especially from the increase of influx of antibiotic as well as fish waste management⁸¹.

2.5.6 Livestock

In Mau complex, resource scarcity is a reality just like any other part of the world. On the side of livestock especially those practice pastoralist, temperature and rainfall variability have triggered migration in search of green pastures and at the same

⁷⁹ UNEP, "The oceans Cover Almost three quarters of the earth's surface and account for over 97% of all life". Retrieved from http://www.un.org/dept/losconvention_agreements/convention_20years/oceansourceoflife.pdf.

⁸⁰ FAO, "The State of world Fisheries and Aquaculture" FAO, Rome 2010.

⁸¹ J.I; Pearce, J;Prمود, G;Peatma, T;Watson, R; Deddington, J.r; and Pitcher, "Estimating the worldwide extent of illegal fishing". Plis one, 4(2), 2009, pp1-8.

time demand of forest resources⁸². However, this vulnerability has threatened the livelihood of these people through the outbreak of livestock diseases like rift valley fever (RFV). At the same time the competence of these people to deal with those threats are severe to cope with.

2.6 Behavioral Impact

This category looks on the way people respond to the threat of environmental degradation. This includes human activities and what people do when they are confronted by this threat.

2.6.1 Health

As a result of environmental degradation epidemic of diseases like Malaria and other water borne diseases do attack the existing population. At the same time, there will be an increase of poverty level on this growing population through the use of the little resources they do have to seek medical attention. Even the government is overburdened by the increase of sectoral expenditure so that health wellbeing of people can be taken care of⁸³. This means that the sick population cannot experience labor costs and productivity⁸⁴. Moreover this will affect the local production of GDP and more so government will direct resources to look for mechanism to curb heat issues. Fundamentally good health is vital in productivity of labor. In case the intervention of the government are inadequate, poverty gap will widen where some people from this sick and poor family will engage in sectorial expenditure and especially from security agencies.

⁸²UNEP, "Reporting forests: A Journalist Guide to the Role of Forests in Sustainable Development and Human well-being". UNEP, Nairobi, 2011.

⁸³ Economic Survey, 2015

⁸⁴ Ibid 55.

2.7 Response Impact

This category consists of huge amount of money induced in relevant and specific activity to curb environmental degradation. Money spent on buying and planting of trees in Mau with an estimate of 7.6 billion trees in the next 20 years⁸⁵. This means that if the climate is not degraded this money can be used to beef up security in our borders for example and at the same time other capital and recurrent expenditure. At the same time, this amount of trees needs representation and to be guarded by the security agencies to avoid uprooting and other environmental malpractices. Kenya being a third world country will need to look for foreign aids and grants as well as new spending on practices of environmental protection.

2.8 Relationship Between Environment and Security

There is a link between human security and environment. For the purpose of this research, the researcher will determine the effects of environmental degradation on violent conflict in Mau complex.

Without any prejudice, environmental degradation has serious consequences and threat to human security all over the world. The implication here is that different human activities like deforestation have an impact on the life of the people and at the same time this change living conditions and military activities⁸⁶. This means that environmental security is bestowed into initial and sustainable development and protection of human race. Environment does not degrade itself, it is as a result of

⁸⁵ Opiyo, D., "USA\$ 3 Billion needed to start climate war". Daily Nation, 18th December 2009.

⁸⁶ Nina, G., "Environmental Security?" Journal of Peace Research Vol 33. No 1 February 1996. Pp. 109-116.

human activities which degrade it and mechanism of growing population must be employed to try and protect it from degradation⁸⁷.

Safeguarding environment is a collective responsibility. This means that when environment is degraded both causes and effects of violent conflict will also affect us all. Due to its degradation in Mau Complex, disputes have occurred into different communities which have been living in harmony from the time immemorial. This is because degradation reaches to a point of intolerance which will escalate into violent conflict where conflict transformation manifests itself. For example, the environmental tension between agriculturalists and pastoralists. There is also fear, tension as well as social-economic based in one's ethnic background which is a security issue.

Security activities like those of military do have opposing impact on the environment. This is for example use of their apparatus for example if they are nuclear in nature. This testing and dumping of these materials and apparatus and specifically if they are radio active in nature leads to the depletion of Ozone layer depletion. As a matter of fact Ozone is very vital for defending earth from ultra-violet rays. The implication here is that the depletion of it will release harmful radiations to earth and humanity has to suffer consequences of it like skin cancer⁸⁸.

Several studies have been carried out on the linkage of environment and security on the incidence of its consequences. Pollution especially in any form will have security implication. Moreover growth of industries do contribute a lot to environmental degradation and means of protecting environment from further damage is supposed to be taken into serious consideration. This is for example establishing

⁸⁷ Ibid 58.

⁸⁸ Marc. A., Levy, "is the Environment a Natural Security Issue". *Journal of International Security*, Vol 20. No.2 Fall 1995, pp. 35-62.

possible links between warring communities like agriculturalists and pastoralists and this will serve as an early warning to ethnic vulnerability and environmental degradation.

2.9 Conclusion

In consideration of the current literature and revived by the learner, impacts of environmental degradation and violent conflict are interwoven where both have severe consequences to the growing economy like Kenya. On the other hand, Mau complex has been a source of violent conflict in political alignments, thus degradation becomes more apparent. Furthermore, activities carried out in Mau should be geared to the prosperity and protection of environment.

CHAPTER THREE
OVERVIEW OF CAUSES AND IMPACT OF ENVIRONMENTAL
DEGRADATION IN MAU COMPLEX

3.1 Introduction

The impact of environmental degradation on security in Mau complex has been prolonged and at the same time different mechanisms employed to bring about conflict transformation. This chapter will lay out the background about conflict in Mau complex. At the same time, social, political economical and historical view about conflict in Mau complex will be considered. Moreover conflict in Mau has manifested itself through other forces and actors where causes are supposed to lead to realization of peace and security. It means that to some extents analysis of the causes to environmental degradation acts as author of ethnic polarization and escalating of conflict.

At the same time both primary and secondary data collected in the field will be given necessary consideration in entrenching both practical and theoretical view in management of peace and security in Mau complex. The outlook of Resource Curse, nature/ nurture in management of Mau complex will be interwoven with causes and actors locally and in global perspective and this is because environmental degradation is a global issue.

3.2 Background of Mau Complex Conflict

For the perspective of Mau complex and its insecurity, provides a foundation for security analysis and its management. On top of this, there is a framework of security, conflict and management process. As a matter of fact the researcher will use different tolls so as to understand Mau complex batter and this is for example theories, colonials

and historical attributes⁸⁹. The conflict in Mau and Kenya in general can be traced back during colonial period when Kenya was under the British protectorate. This country remained a British colony until 1963 where Kenya becomes a self-rule. Jomo Kenyatta being the first prime minister of Kenya received instruments of power but issues related to conflict remain unsolved.

Environment is a thorny issue in flesh through internal struggle for Mau resources and exploitation in Mau complex, as a settlements scheme and later remained a highland. Moreover, conflict goes to a step higher when the later successful governments used environment especially land to reward royal politicians and cronies⁹⁰. In this regard Mau complex has experienced a number of rebellions have giving birth to Militia groups and movements which are a threat to peace and security.

The above observation can be exemplified in to 2005 constitutional referendum of the new constitution. Through the campaigning period of banana and orange symbols which were used for *yes* and *No* respectively. The dwindling of Kibaki administration was pivotal in Yes and No campaign and the winning of Na transformed itself into a political movement of multi-ethnic alliance so as to bring to an end the administration of Mwai Kibaki into general election of 2007⁹¹. After the defeat of the new constitution, all cabinet ministers were suspended and those who were in No campaign were not reinstated during the reconstruction of the executive.

⁸⁹ Africa Policy Report, "Fighting for the Mau Forests: Land, Climate Change and Politics of the Kibaki Succession". Africa Policy Institute, June 2010.

⁹⁰ Africa Policy Report, "Fighting for the Mau Forests: Land, Climate Change and Politics of the Kibaki Succession". Africa Policy Institute, June 2010.

⁹¹ Voting on a constitution, "Implications for Democracy in Kenya. Journal of contemporary African Studies". Vol. 27, No 1, Jan 2009. PP 1-20.

This was a phenomenon which was advanced by Mwangi⁹² in his opinion over conflict and its internationalization. The implication here is that for a conflict to be determined to the process of internationalization, concept of interdependence and one actor are involved to the attainment of crucial instruments of power⁹³. In 2005 referendum different communities were wooed by No team with an understanding of evicting peoples who have inhabited their land and referred as “madoadoa”. The Mau complex has been a beehive of activities especially after 2005. Most of the activities are linked to ethnic polarizations as a result of enormous natural resources which is mostly dominated by timber and agricultural friendly just to mention a few. The raiding of Mau complex resources remains a perpetual limitation in understanding and analysis of various violent conflict and security issues which manifest themselves in Mau complex.

The conflict of Mau complex is based on its particular conflict system in Kenya and wider eastern Africa. The implication here is that a number of actors are drawn into Mau with different and vested interests. The intensity of conflict manifests itself more when tourism sector is affected due to inadequate water to sustain it. However there was an internal intention to save many especially the afforestation which was to be conducted on January 15 of 2010⁹⁴. At the same time, there was a manifestation of security agencies used to propel tree planting as well as providing direction and security to the water tower.

Third parties like African Union AU and United Nations UN interests for their support of tree planting exercise could be seen as a scheme to assert themselves in

⁹² M. Mwangi, “Conflict in Africa Theory, Processes and Institutions Management”. Nairobi, CCR publications, 2006.

⁹³ Ibid, 94.

⁹⁴ Africa Policy Report, “Fighting for the Mau Forests: Land, Climate Change and Politics of the Kibaki Succession”. Africa Policy Institute, June 2010., Op cit, P. 34.

leadership of this country especially the succession politics⁹⁵. After the 2013 general elections we have not heard more about Mau restoration from third parties like US and EU.

3.3 Comparative Analysis of Impact of Environmental Degradation and Security

3.3.1 Land Disturbances

As Mau Complex cover 237,000 Ha, Majority of the population to fight the land due to its scarcity. The implication here is that there are a number of human activities affecting environment and security. As we have seen in chapter one the projection population growth by 2050 globally. This means that the current water tower will be affected too⁹⁶ some communities like Kalenjin who are agriculturalists seems to benefit more than communities which are pastoralists like Masaai as Mau has favorable climate and its conducive for arable farming.

3.3.2 Population

Initially at independence in 1963, Kenya population stood around 15 million and in the year population stood at 42.6 million which can be regarded as 18.2 percent. This means that the population growth rate do have implication in wealth sharing, distribution as well as support of urban setting who mostly rely with forests products⁹⁷. Unfortunately national census which was conducted in the year 2009, encountered a lot of resistance because of the people being countered more than one time and this had effect in revenue allocation and also to the environment as some people will look for other alternative means of livelihood.

⁹⁵ Ibid 94.

⁹⁶ Ministry of environment, "Towards Environment Sustainability, State of the Environment", 2005 Report (PDF), 23 June 2011.

⁹⁷ Interview with Gilbert Kirui, Official in the Ministry of Planning and devolution.

At the moment, Kalenjin community which is the third largest community in Kenya with a total of 14 percent of total population⁹⁸. This means that they will be more visible in environmental degradation in Mau than other communities plus their economic activity. However, population growth do not necessary reflect large labor force but the scramble of scarcity Natural resources is susceptible. In return this will promote rate of unemployment and increase poverty level.

3.3.3. Mineral resources

Economic growth and development are mostly realized through favorable environment. This means that Mau complex serves as a deposit of natural resources like water and this has great advantage in social growth. Moreover, we can't import water from other counties which such kind of huge water tower. It is not only water there are other natural resources found in Mau there are other like timber and when this is degraded, both local and international trade will be affected thus increasing poverty as well as pauperism. At the same time, encroachment and illegal logging in Mau complex is a major threat to its sustainability. The government of Kenyan from 2009 intensified the rehabilitation and conservation of Mau complex so as to restore the degraded environment⁹⁹. This is shown by the figure below from Kenya Forest Service.

⁹⁸ Kenya National Bureau of Statistics, Population census 2009.

⁹⁹ Ibid 99.

Stocking	2010	2011	2012	2013	2014
Previous plantation area planted ¹⁰⁰	112.7	118.8	121.1	127.1	129.3
Area Planted	9.6	8.8	7.4	8.2	7.1
Total	122.3	126.8	129.1	135.3	136.4
Area clear felled	2.8	3.9	2.2	4.8	6.1
Planting failures/ damages	0.7	1.2	..	1.2	1.0
Total area	118.8	121.7	127.1	129.3	129.3

Source: Kenya Forest Service.

The irony is that as there was effort to increase forest cover the *clear felled* increased and this is as a result of logging and especially to the less overgrown trees. At the same time there are other challenges and threats to forest cover like fire and planting failures. Moreover sales of products from the forests have been on rise and especially the products from state forests. For example the manifestation of the following data from Kenya Forest Service is a clear proof of environmental depredation and security. The sale to *timber increased by 28.3 percent from 933,7 thousand true cubic meters in 2013 to 1,197.6 thousand true cubic meters in 2014*¹⁰¹. The implication here is that hardwood timbers are used and are sold to some local companies like Kenya Power and Lightening Company (KPLC) as power posts and this has increased illegal logging due to the need of power especially in rural areas through Rural Electrification Program.

¹⁰⁰ Opening stock at the beginning of the year.

¹⁰¹ Ibid 95.

3.3.4 Wildlife

As a matter of fact, livestock rearing, wildlife, grazing dominated land use in Mau complex. In this regard, Mau complex is home and source of water for pastoralist communities. At the same time it serves as a tourist destination due to its rich in wildlife. This implies that its destruction has affected its ecological system too. Moreover destruction and degradation of ecological system will affect the visitation of tourist in this republic and it evident that as a result of degradation various herbivores have declined for example giraffe, elephants just to mention a few.

It is worth noting that despite being other human activities like poaching which led to decrease of wildlife; degradation of Mau complex has played its major role as a result of charcoal burning, installation of new settlements, increased infrastructures development as well as poor land use.

3.3.5 Poverty

Poverty level is a major portrayal of population growth as well as socio-economic development indicator. Since independence in this country, statistics shows that literacy level and unemployment are still extreme¹⁰². This kind of scenario put people in a situation where they need to look for their livelihood whether right or illegal. Some other factors which lead people to degrade forests are 2005-2010 global economic recession. This further can be manifested itself in corruption are nepotism as people need to meet their livelihood regardless the means. The Kenyan successful governments since independence have been confronted by all form of challenges to counter poverty increase as well as its reduction to the barest minimum¹⁰³.

¹⁰² GoK, KNBS, Economic survey, Nairobi, 2015.

¹⁰³ Ibid 102.

On the other hand, more than 25 percent of Kenyan population is living below poverty line since 1960. Unfortunately this given percentage raised to almost 47 percent in the year 2000 as a result of environmental degradation and economic recession¹⁰⁴. This has increased mismanagement of environmental resources, encroachments into water towers, and decrease in food security as well as wide spread of illegal logging. One third of Kenya population stands to be living below poverty line. The implication here is that, there are more poor people currently than it was at independence era. However, protection of forest cover can be realized and steer economic growth if there is political will and less corruption will dealing with Mau forest products.

3.3.6 Infrastructure

Maintenance of infrastructure like roads is a big challenge which confronts African continent. As a result of raising temperatures, high storms due to environmental degradation 15 percent of roads are usually damaged by floods¹⁰⁵ and destruction of water catchments which serves as reservoirs of water. At the same time, when roads are destroyed the money for recurrent expenditure goes to special program and also this is a security issue where security agents are to perform protection duties to citizens. This will eventually lead to logging because of the tress are used as temporary bridges and its costs life of people who are using those foot bridges.

At the same time, transportation of forests products like timber and logs are of security concern. The implication here is that due to heavy density of forest products this leads to dilapidation of roads, traffic snarl-up as well as road carnage. Following an interview with a staff at the ministry of Planning and devolution, any construction of

¹⁰⁴ Ibid 102.

¹⁰⁵ See <https://web.archive.org/web/20061231160516/http://www.worldairportawards.com/awards-2006/airportyear-2006.htm> Last accessed 14th February 2016.

road has implication to environment especially to water towers¹⁰⁶. This means that under normal circumstances there are so many occasion witnessed landslides due to friction of environment and infrastructure.

At the same time while some roads end up being unstable and they do affect environment as some engineers try to find way even to reserved areas. Moreover, from 2012 the government has been spending almost KS's 20 Billion annually with intention to lower cost which is facilitated by consequences of flooding. However, we have new roads being constructed is on an increase and at the same time certain amount being set aside for maintenance as to climatic reasons.

3.3.7 Unemployment

Unemployment has been identified as a major challenge facing environmental degradation since independence. There are numerous mechanisms and policy employed by different successful regimes but unemployment has affected many Kenyan especially the youth. According to economic survey of 2015, the number of Kenyan openly unemployed stood at 2,700,623 in 2014-2015 and this is derived from integrated labor force survey. Despite this, there is an increase of GDP but some income generating projects is not in consistence with growth of labor force and this makes some young people to engage in unlawful activities like logging and poaching.

This is a threat to the security of this unemployed population but seeking livelihood from environmental degradation and especially when they encounter forest warders and game rangers. Contradicting, most of Kenyan people relay with agricultural employment and this has serious implication into environmental degradation where this growing population needs to support it. In return desertification

¹⁰⁶ Interview with Peter Mutuma* this is Pseudo name Ministry of Planning and Devolution.

and aridity will manifest in the contemporary society which is a threat of environment and security too.

3.4 Gender Differentiated Environmental Impact

As a matter of fact, men and women are affected differently by the impact of environmental degradation. At the same time, they do act and respond differently to these effects and challenges. There is stereotype that the female gender is most vulnerable and disadvantaged as a result of environmental degradation. This seems to be true because as a result of climate change which is facilitated by environmental degradation, chronic food and food insecurity and other natural disasters affect women more than men. Moreover women who live in a less than a dollar a day, they suffer most the negative impact of environmental degradation and this is because the compositions of women who are poor are compared to men.

In spite of this, in Mau complex gender inequality exists, especially at the pastoralist communities, environmental degradation further the gap of inequality as a result of gender sensitive responses to environmental degradation¹⁰⁷. At the same time, we have seen specific inequalities especially to the communities in Mau complex as this is based to gender differentiated to the beliefs; roles as well as access to environmental resources which make women are weaker to the impact of environmental degradation.

This means that women are provided with different skills in order to cope with impact of environmental degradation. However, land is a scarce resource where women have limited opportunity to resources like land and its tenure, large livestock, property ownership and they are the greatest casualties of environmental degradation

¹⁰⁷ Bridge. "Gender and Climate Change: Mapping the Linkages". University of Sussex: Institute of development Studies, 2008.

than men. At the same time, their security is more compromised as they have to work extra hard so that they can meet their basic necessities as well as livelihood.

As their male counterparts migrate to urban areas, in search for formal employment, women are engaged in environmental degradation especially with fetching firewood as well as they perform other domestic chores in their household¹⁰⁸. As a result of social norms the opportunities of women are limited. This means that at hard times, when men move in search of green pastures and other sources of income, women will be acting as heads of the family and despite this they do need approval of their male counterpart to perform certain duties which are determined by male gender.

3.5 Impact of Environmental Natural Disaster on Economy

A major key finding is that there do exist variability between environment and economic cost implications. Since 1997 Kenya has been faced by different El-Niño phenomenon and this has major and serious implication on the economic growth. Without any prejudice, economic costs do affect both environment and security for the whole economy. This means that there are millions of citizens who require relief services as well as rebuilding afresh their life which has been affected by natural calamities. At the same time, destruction of structures, infrastructures will require more funding to assist the citizens who are affected. This is a burden which will have impact to GDP and affect security and development of the nation.

However, environmental degradation poses significance uncertainties into the coming generations. Despite lack of appropriate mechanism to cater environmental degradation and economic costs, El Nino, Lanina, rising of temperature which confronts our contemporary society, will increase drastically in coming years as a result

¹⁰⁸ Speranza, C., I. "Promoting Gender Equality in Responses to Climate Change- Case of Kenya". Bonn: Deutsches Institut Fur Entwicklungspolitik, 2011.

of non-environmental variables from population increase. The implication here is that as population grows, economy is not left behind it will grow too and both of them will have direct economic implications. Impacts on famine and food insecurity will lead to raise of intensity thus an area like Mau complex which is supposed to increase economic costs; will degrade the region into a region of aridity.

3.5.1 Agriculture

The natural labor force labor force of 75 percent¹⁰⁹ comes from agriculture sector. This means that agriculture is the backbone of our economy. However we are still in ancient agricultural practices where new technologies are not employed fully. The implication here is that the reliance of rain fed crop production agriculture act as a basis of food security, creation of employment and monetary exchange. Mau complex being a high agricultural potential support almost 80 percent of communities living around it. However the urban centers residents do depend both directly and indirectly on agricultural produces for their food as basic necessity. The rural residents who are majority are most susceptible to the effects of environmental degradation. The following table shows division of land mass in Kenya.

Medium& high potential	Game reserves	Crop land	Graze land	Forest	urban	Total
9.4 M HA	1.1 M HA	2.8 M HA	2.8 M HA	2.0 M HA	0.5 M HA	57.6 M HA

Source Kenya Vision 2030, 2007.

The extreme of environmental degradation and destruction of Mau complex has severely affected agricultural production and this also manifest itself to declining of

¹⁰⁹ GoK, KNBS, Economic survey, Nairobi, 2015.

food production as well as logging of water in arid and semi-arid areas¹¹⁰. This destruction has increased food shortage and crisis in the whole country. This will bring about conflict especially to the scramble of precious commodities like water as well as migration due to the wide spread of drought in search of green pastures and livelihood. Performance of agriculture keep on oscillating and it also fluctuates with weather patterns which are embedded in environment. As a matter of fact, chronic drought do damage environment thus causing injury to agricultural sector. As population most of the time we do rely on rain fed agriculture, production is affected by difference in precipitation that have serious implication and environment, economy and food security.

As a result of degradation of Mau complex crop and livestock's production have threatened security and especially the areas which depend on Mau complex for livelihood and economic growth. Some of the impacts which contribute to this are for example livestock dying and decline of its value price, loss in households' incomes, conversion of protected areas into agricultural land. Hence, poverty will increase especially to the vulnerable groups. At the same time, this will create an environmental calamity and create additional pressure to environmental degradation to both livestock and cropland¹¹¹.

3.5.2 Livestock Sector

Livestock stock production and rearing has played a significant role in Mau complex degradation. As pastoralism also form a given percentage to economic growth, drought periods overgrazing led to encroach in Mau complex, thus soil erosion

¹¹⁰ Mariara, J., & Karanja, F., "The Economic Impact of Climate Change: A Ricrdian Approach." World Bank Policy Research Working paper, 2007.

¹¹¹ Tegemeo Institute. "Maize Production Outlook and Implementations for Food Security." Nairobi: Tegemeo Institute , 2009.

and drying up of some rivers. Both small and large pastoralists are most are most of the time seen in arid and semi-arid areas but during drought they move to areas that are seen to be favorable and with pastures Mau complex being one of them. Environmental degradation hinders livestock production because of drought where pastoralist loses approximate 70 per cent of their livestock. For instances in the year 1999-2000 pastoralism sector experienced a great loss of approximate US \$ 73 million which is ascribed to drought¹¹².

At the same time, in arid and semi-arid areas there is prevalence of strong wind which is also affect livestock production. Moreover high grazing leads to relocation of top soil and this is also a hindrance to germination of grass. Further there is a manifestation of increase of carbon dioxide at the atmosphere and this hamper livestock rearing, reduction of food value as well as environmental conveying ability. At the same time, wildlife is not left behind as reduction of livestock reduced forge of advantages which could impact livestock reduction to the farmers. This means that inadequate preparation and mechanism to prevent animal diseases which is also transmitted to wildlife herbivores thus I need to create a diseases free zone.

3.5.3 Energy

Supply and demand of energy is affected by environmental degradation. According to vision 2030, the government is to ensure adequate and supply of energy to foster natural growth but this is supposed to be embedded in preservation and conservation of environment¹¹³. Mau complex is an agent of production of electricity posts and this encourage illegal logging. This facilitates decreased supply of precipitation due to the supply hydropower. Deforestation has facilitated to the raising

¹¹² UNEP, 2002.

¹¹³ GoK, Vision 2030.

of temperature which has implication to the increase of demand of energy for heating and cooling.

Moreover, during the cold seasons there will be high demand as well as raise of temperature require energy for cooling. Energy is harvested in environment especially renewable and non-renewable. This is for example wind, biomass, hydropower, petroleum and geothermal. According to statistics derived from Vision 2030, electricity is the third most utilized source of energy after wood and petroleum.

Wood fuel & other biomass	petroleum	electricity	others
68 Per cent	22 per cent	9 percent	1 percent

Source Vision 2030.

Through this environment is degraded especially by getting forest posts some of which are taken from water catchment areas. Moreover, Rural Electrifications Program shows that more posts are needed for the connection to the national grid and at the same time, other vegetation like tall trees are cleared where the electricity lines passes. According to the findings environmental systems in Mau complex and in the whole country generally portray serious limitations to the current existing energy system¹¹⁴. This means that due to lack of several key mechanisms which champion extended resilience in the energy system like existence of power plant and more importantly mechanisms to cope and operate within the extreme weather and climate events¹¹⁵.

As a country which depends highly on hydropower, system of electricity supply, there are inadequate national plans for fine tuning hydropower plants operations without degrading the environment. At the same time, environment is further degraded

¹¹⁴ Williamson, L, E., Conner, H., & Moezzi, M., “Climate Proofing Energy System, Pens”: Helio International. 2009.

¹¹⁵ Ibid 114.

by insufficient manpower that can desilt gates so as to confront the challenge of extreme flooding where sedimentation, land use and its management is supposed to be in place. There is serious impact of not accessing downstream and providing land management program.

3.5.4 Health sector

Environmental degradation has posed the burden of climate sensitive diseases. Human activities and environmental depredation of weather variability are more responsible for negative impact of human health. During flooding we do experience water borne diseases, malnutrition as a result of drought and famine where on top of this emergence of vectors which are agents of infectious diseases. This also is of great security concern especially when we come to reproduction. The impact of environmental degradation also has high increase of malaria infection. These diseases pose one of the greatest health issues in Kenya and it account to almost 30 percent of patients in our hospitals¹¹⁶.

Moreover, at least 70 percent of Kenya population lives in an environment which is at a risk of Malaria infection. The implication here is that a highland like Mau complex which was initially free malaria contamination it has been exposed to the risk of Malaria as a result of raising temperature and environmental depredation. Further, this is a contested debate from some environmental scholars like Patz who argues that “it is evident of an increase in the incidence of Malaria infections in the highlands, methods used to detect it are controversial and do not convincingly prove or disapprove the association”. Moreover there is projection that by year 2055, temperature will rise to 2.3°C as a result of environmental degradation and the large population especially in

¹¹⁶ Patz, J., A. Et al. “Impact of Regional Climate Change on Human Health Nature”. 438, 310-317.

the rural area and approximate 63.5% of Kenya population will be affected malaria¹¹⁷. At the same time, direct economic costs will raise and the security will be threatened as a sick population cannot perform to the expectation and other budget for government will be diverted to health for the sustainability of health-well-being.

3.5.5 Forest Sector

Generally the significance of Mau Complex and other forests cover cannot be underrated. This is because they do control global warming, slow aridity and more importantly attracts clouds and enable rainfall. At the same time, they do serve as storage of carbon dioxide. Despite this all advantages, Mau complex is so degraded through deforestation and increase of extensive cultivation of agricultural produce for both subsistence and commercial use. Mau as a water tower is key in mitigation of environmental induced disaster. This is depicted by the figure which is extracted from state environment report (NEMA) 2005.

Indigenous forests	2.1 %
woodland	3.7%
Plantation	3%
Bush land	42.9 %
Mangrove	1%
Wooded grassland	18.5%
Grassland	2.1%
Desert	13.7 %
Farmland and urban development	16.5%

Source NEMA

¹¹⁷ UNFCCC. “Kenya’s Climate Change Technology Needs for Needs Assessment Report UN Framework Covention on Climate Change”. New York, 2009.

Mau complex is a major development in rainfall. As rainfall pattern keep on changing as a result of environmental degradation, there are occurrences of aridity and desertification. Further this impact brings about more emission of Green House Gas (GHG) as a result of logging and deforestation. Moreover, there is reduction of agricultural produce thus threatening the livelihoods of the growing population. Degradation of Mau has changed the temperature where even wildlife living in Mau has been poached while others becoming extinct. At the same time, it is not only wildlife even some vegetation species become extinct like *Meliavolkensii*.

The population growth and the subsequent increase of both non-renewable and renewable resources have contributed to the destruction of Mau through deforestation so that structures for human habitant may be created. However, when these households are established, there will be increase of demand in energy like fire wood and this means that people will encroach into water catchment areas so as to get this basic necessity. At the beginning of this millennia, Mau caught fire and huge thousands of Ha caused unknown economic damage. On top of this, between 1990-1999 in Kenya, more than 125,791 Ha of forest cover was deforested and in the same period of the years over 45,000Ha were cleared to setting up human settle and crop cultivation¹¹⁸.

Without any prejudice population growth is supposed to be embedded with economic growth. The implication here is that if population growth is not commensurate with economic growth, there will be poverty increase where poverty will lead to environmental degradation especially through deforestation. Mau forest as a water tower and a natural forest, its degradation have altered the fitness to human existence and thus migration occurs in search of proper livelihood. From the data in the

¹¹⁸ Ibid 117

field, there are serious fears that degradation of Mau complex has led the presence of tree pathogens and this increases new botanical diseases.

3.5.6 Fisheries Industries

Environmental degradation of Mau complex has negatively affected the fishing industry, deforestation of Mau has led to changing of temperature and this has altered fish population especially in Lake Victoria. Severe rainfall and high dry spells they do have implication of reduction of plankton population and this has serious negative implication on fishing stock. Moreover when the country is experiencing El Niño for example it threaten life and livelihood of fishes and bearing in mind that they do relay on fishing for their basic necessities. When Mau complex is being degraded, a good number of fishermen will be jobless and this will increase the crime rate, as some will engage in illegal activities as they seek livelihood. On the other hand, overfishing lead to decrease of fish population and this do have impact in the changing and drying trends of economic activity in Kenya.

3.5.7 Security Sector

From chapter two of this research, it has emanated that Mau complex has been a theater of armed conflict even before the colonial era. Perennial droughts, population growth, political undertones and marginalization are some of the factors which have pushed the complex into a spiral of violence and this has led to displacements of human population and a number of lives have been lost. Despite of having different causes of conflict in Mau complex all of them have inter-linkage with environment and its degradation for example scarce of natural resources, population growth, water scarcity as well as loss of fertile land for agricultural practices.

This study from March 2016, has demonstrated that pastoralism as well as competition of pastoral land, water has been a propelling factor behind the confrontation and acrimonious debate on restoration of Mau where agriculturalist were for compensation of the evictee and non-compensation by the MPs who hails from pastoralists communities, recently, there is a manifestation of population increase which has threatened pastoralism, tourism, agricultural livelihood as a result of high demand of water and land. The implication here is that the population growth has led to overgrazing which in turn tare the vegetation. This increases desertification and washing of top soil thus leading to soil erosion and increase landslides and aridity,

On the other hand, livestock increase has facilitated to the degradation of Mau and we have witnessed confrontation between different clans, ethnic communities over Mau complex resources for sustainability of their livelihoods. The concept of degradation of environment and security has been triggered by a number of factors like insufficient knowhow of waste management, industrial engagements as well as agricultural practices. Violent conflicts do manifest itself through degradation of landmines as well as unexploited minerals where most of the resources are within the water catchment areas. Survival of the current population when these practices are transformed is at stake especially when forests catches fire and this is seen as a very extensive cause that has degraded Mau complex.

At the same time, structural violence recurs when pastoralist and agriculturalist communities increasingly compete for Mau complex products. The implication here is that both activities are limited and restricted in accessing the forests and this will promote ethnic animosity as well as insecurity whereas the growing population is not sufficiently resilient hence poverty is entrenching itself in the life of many citizens and this lead to decline of resources, tension in relationship of one or two groups contribute

to violence. In Mau Complex, a number of violent conflicts have manifested itself due to environmental degradation especially the multi-ethnic competition of these resources. This is for example climate change, scarcity of natural resources as well as loss of top soil that is more fertile for agricultural practices. This will result into fragmentation of land, hence promoting overgrazing as well as over-cultivation. As a result, environmental degradation will lead to less productivity thus threatening the economic growth as well as to support the growing population.

3.5.8 Water Sector

From chapter two, we saw that Mau complex is a source of twelve rivers that feed approximate six lakes. Despite this the issue of inadequate water is still there both for domestic and industrial use. The implication here is that environmental degradation has threatened every social sector for economic growth. The degradation of Mau complex shows that rainfall has decreased, raising of temperature thus reduction of water resources. However the growing population is in dire need of this precious commodity and its lack simply means that poverty will increase as a result of its demand. Its competition for domestic, agricultural and wildlife may facilitate eruption of violent conflict and its intensity lead to loss of lives of ordinary citizens.

As a matter of facts, water use is almost twice usage compared to the rate of population growth. This means that water use for industrial, domestic and agricultural has really increased and in the coming generation there will be acute problems for current population to meet its needs for water. As a matter of fact, pastoralist's communities which heavily depend on Mau complex do suffer water shortage as a result of degradation. Moreover, rural population especially women are forced to travel long distances to fetch this precious commodity and this also put their security at stake.

Sampling procedure

As the major aim of this study was to empirically examine impacts of environmental degradation in Mau complex. Both primary and secondary data from respondents were used to form sample. The importance of the variation among research variables and this will assist the researcher in testing of hypothesis. In this research, the learner conducted simple, purposive and stratified samplings. The researcher used different stages in carrying out the shortlisting of the variables of the interests.

3.6 conclusion

Following the above findings, it is important to note that environmental degradation has contributed to increase of poverty of the growing population. Thus serious mechanisms are supposed to be employed to counter environmental degradation so as to improve economic growth and better livelihood of the growing population. On top of this, it is vital to examine the human activities which hinder economic growth at the expense of environmental degradation. Moreover, the findings portrays that according to the one of the hypothesis of this study there is a correlation of causes, impact and security of environmental degradation and this is manifested by a cause affecting another cause and the same case applies to impact.

CHAPTER FOUR
ASSESSMENT OF KEY IMPACT ON ENVIRONMENTAL DEPREDAATION
AND SECURITY

4.1 Analysis of Research Findings

From the previous chapters there is link between environmental depredation and violent conflict has been looked into. This chapter seeks to make a synthesis of results from other chapters. It examines the findings of the research in terms of objectives, stipulated in the background of the study, tests the hypothesis in order to legitimize the research findings. As a matter of facts, the researcher makes on evaluation of causes and effects environmental degradation and violent conflict in order to have peace process.

The researcher stipulate objectives at the proposal stage which are based on “The Impact of environmental Degradation on Security: A Case study of Mau Forests”. The proposal chapter served as a basis of this research work by looking into concepts of environmental degradation and security. The concepts of environment identified three extents of possible, structural and trigger causes of environmental depredation. The effects of the same had three dimensions too stated as direct, behavioral and response. The exploration of causes and effects provides for understanding that security and violent conflict is all about needs, interests, values and wants that are debatable and are matter to settlements. As a matter of facts about environmental degradation is not negotiable and thus the implications of its severe depletion cannot be compromised too. At response impact, we saw different actors like UNEP and EU introducing

mechanisms to restore Mau complex thus internationalizing Mau and bringing international mediation of a conflict¹¹⁹.

Chapter one of this study has laid a foundation and fundamentals that guided this study. The implication here is that, research objective's, questions, justification, assumption of the study all are made on the proposed research. On top of this, the learner theorized conflict and security systems approach in Mau complex. Theories suggest that the research would entail evaluation of resources curse and nature/nurture theories in a multi-sectoral setting¹²⁰.

Chapter two stipulated causes and effects of environmental degradation and resources based on security. The chapter further conceptualized the trigger causes of environmental degradation as a result of resource scarce and population growth. Moreover, it is worth noting that Mau complex conflicts are too difficult to settle and they keep on being transformed. We have seen involvement of third parties like UN as well as other external actors involved in the resolution of these conflicts. At the same time, we have observed that intensity of conflict keep on changing in relation to measures taken for example the acrimonious debate in resettlements and compensation of population who have encroached Mau Complex.

This means that involvement of third party is a peaceful process and taken into consideration of all community members, states as well as external allies. Additionally chapter two recognized several challenges in tackling peace processes in Mau Complex¹²¹. It was observed that security is intertwined with natural resources which are of high demands and great value both locally and internationally. Different MNCs

¹¹⁹ Mwangi, M., "Conflict in Africa Theory, Processes and Institution of Management" Nairobi, 2006.

¹²⁰ More Details Captured in Chapter one of study, subsection 2.1

¹²¹ Ibid 119.

would support a party to conflict transformation at the pretext of high resources which are of great demand in international market. The security is compromised when conflict escalates into a point where the growing populations we have witnessed that some are displaced at the expense of exploitation and this means that causes of environmental degradation are protracted and circumstantial effects leads into conflict transformation.

At the same time, dynamics on the causes of environmental degradation come evident. Mau complex resources, pose to the theory of resource curse based conflict and its management. In this regard, approach to some causes is supposed to be employed in conflict transformation so as to avoid resources degradation and exploitation. At the same time, this chapter indicates that environmental degradation based conflict's does not only confront security but also lead to struggle for territory and territorial proximities. There is a clear indication that conflict arise from human, individual or group conducting different economic activities, interest values and needs are not realized. Emergence of conflict transformations based on availability of natural resources in Mau complex is still triggered by the growing population where some communities can fight for upkeep and livelihood. In this regard, based on economic activity, social disparity in control of Mau complex and its resources pose as a strong source of security and conflict. The implication here is that for a comprehensive peace process to be addressed, different actors needs to be employed so as to avoid post-conflict insecurity¹²².

Chapter three explored the case study of impact of environmental degradation in Mau Complex¹²³. This chapter brought serious findings in relation to impacts of

¹²² Ibid 121.

¹²³ More details captured in chapter of the study, section 3.1

environmental degradation as well as conflict management. The implication here is that economic activities, population growth as well as intervention of third party actors do affect the peace support on any peace agreement¹²⁴. It is evident that there were different peace initiatives in Mau complex and they were not fully realized. The Ministry of Environment and Natural resources as well as EU were not in a position to come up with an ideal peace agreement in Mau Complex¹²⁵. This can be solely attributed to inadequate regulations of different causes in Mau complex. At the same time, enforcement of peace agreement for the sustainability of Mau complex encounters hostility towards government and other stakeholders and especially the illegal occupants into the forests.

The following actors AU, EU, UN, USA, are seen as actors with adequate manpower in engaging population and government in resource based conflicts¹²⁶. This means that the AU and UN do have a sub-regional and global support and they have mandated to engage military personnel's in humanitarian effects and territorial peace¹²⁷. At local level EU voluntarily to support through funding of the population evicted and living in Mau complex¹²⁸. Action was taken by AU in order to have peaceful harmony especially between Uganda and Tanzania as well as intervention made by UN.

In this regard, international bodies through AU they have transformed conflict in Mau complex. After the acrimonious debate in parliament, heavy forest warders could be seen in Mau complex in evicting the squatters and encroachers in the forests and to some extents this was reinforced by military presence. More importantly AU

¹²⁴ Interview of the researcher with Head of NEMA, Nairobi, September 6th, 2019.

¹²⁵ Ibid 124.

¹²⁶ Mwangi, J., Kinyanjui. "NDVI- based Vegetation monitoring in Mau forest Complex, Kenya, African Journal of Ecology", Vol 49, 165-174, 2010.

¹²⁷ Mwangiru, M., "Conflict in Africa Theory, Processes and Institution of Management" Nairobi, 2006.

¹²⁸ Ibid, 126.

and EU have been capable and through the work of locals planted millions of species of indigenous trees so as to restore Mau complex. However, chapter three established some of the reasons which escalate conflict in Mau complex. This is for example overpopulation as well as competition of inadequate resources in Mau complex. This means that neighboring countries like Uganda and Tanzania will also suffer as a result of drying up of Lake Victoria for example. The assertion of these perceptions is that sub-region will allow them to protect the environment in order to avoid resources exploitation.

4.2 Assessing Key Causes of Environmental Degradation in Mau Complex

4.2.1 Disturbance of land

In the recent years, there has been a surge of interest of population of all walks of life to access land and other natural resources. Active enunciation of independence in this country and other African nations gained momentum after the respective nations gained independence for our case 1963 and with adoption of National Land Policy by Gland National Coalition Government. Post-independence has received increased population growth thus rendering natural resources to be scarce. Due to this rise of population growth, there is an increase of intensity of atrocities related to environment and its degradation both locally and globally. In other words, despite the land policy and entrenchment in the constitution private land, public and community land it is felt that this is too general to effectively address the various violations of land and disturbances, hence the promulgation of the various mechanisms to cope with environmental degradation like vision 2030.

The failure blue print like vision 2030 dealing with policies to effectively address plight and protection of water catchment area, the realization of clean

environment cannot be achieved. Due to inability of the growing population to meet the basic needs as well as safeguarding the wellbeing of their loved ones, this spur new efforts to address environmental degradation and deprivation of the entire society from basic commodities like water. Land protection is taken by various international organizations like UNEP that have adopted policies and programs on environmental protections. While providing a welcome break from the past history of land disturbances, this new found actor (UNEP) and its mandate still remains largely challenge especially without proper collaboration with the local government. We witnessed little inclination to implementing environmental rights and this increased cases of environmental degradation in Mau, increased incidences of logging, increased diversion of water (rationing) especially in urban centers, high demand of wood as a source of energy just a few indications of environmental degradation. The real impetus for action and confronting environmental degradation is coming from rising of temperatures by disturbing land. However, this has often pioneered new paradigm to sensitize population on the good of protecting a water tower like Mau.

4.3 The role of water tower in conflict

Violent conflict over water tower and in this case Mau complex manifests itself based on the contestation of ownership, management, allocation and utilization of resources found in Mau. We witnessed conflict becoming structural where societies living around Mau, inadequate mechanism employed by different institutions and actors fail to resolve conflict, thus perpetuating violence. Before the promulgation of 2010 Kenyan constitution our communities could be regarded as weak, fragile eroded with divisive politics where a cyclic of conflict confront societies and especially the electioneering period. The increased agitation of land both for agriculture, pastoralism

as well as other economic factors, form the basis of drivers of factors that do contribute and trigger structural violence.

The cyclic eruption of conflict based on access to forest resources need to be tackled by ensuring peaceful and harmonious resolution are at the center of both local and international actors. As we witnessed a number of causes of conflict between communities, environmental degradation do trigger violent conflict as provided in Chapter Two.

Therefore from the above table it is important to diagnose causes of conflict over environmental degradation and at the same time take particular mechanism in terms of conflict transformation. Moreover, preventive measures are supposed to be conducted over environment and its protection. At the same time, when violence that has confronted this country since independence it is important to note that it is mostly associated with environment especially rangeland and water.

Violent conflict in Mau is interwoven with environmental factors in a heterogeneity ways which can be seen and be driven by factors like political temperatures, ethnic tensions and balkanizations and more importantly poor governance. The implication here is that, there will be severe competition based on capitalism ideology so as one can gain access and take a supervisory role on environmental resources like agriculture, pastoralism hence leading to eruption of violent conflict. Mau forest was and has been used for succession politics and at the same time, emergency of youth in some communities being armed in escalation of violence. Mau has been exploited during electioneering period by rewarding royal cronies with huge pieces of land so as to create motivation and in return peaceful efforts can be derailed.

During the post-election violence, Mau suffered terribly and this is because the targeted communities were seeking refugees in any available place. Some of the communities like Ogiek which survive in hunting and gathering where through this struggle is manifesting itself to the population to degrade the environment so as it can meet its livelihood. More so we witnessed survivors of civil strife being resettled in Mau complex. On the other hand, as government was looking for a land to buy so that the post-election victims can be re-settled which was an estimated to be 650,000¹²⁹ persons and some have encroached Mau complex.

In a nutshell, environmental degradation especially Mau complex has played different dynamics of Mau degradation. These dynamics of Mau degradation and the resources found in it leads to escalation of conflict, hence it is important to understand conflict is supposed to be transformed in all sectors for an egalitarian community. At the same time, there is a thin line in distinguishing environmental questions and security. The implication here is that, maintenance of security foster economic development thus providing livelihood to the growing population and at the same time, degradation deteriorate livelihood of the growing population.

From the research findings, environmental degradation in Mau contributes to conflict escalation and through law and other policy makers are triggered on the mechanisms to prevent conflict and its escalation. This means that to some extent Mau has been polarized both from revenue collection from wildlife especially during migration of wild beasts and this has founded ethnic grouping and this is seen as a major both external and internal conflict. Moreover, rationing of water both to rural and urban centers has been politicized too and this facilitates escalation of major conflict which is based on social inequality and ethnic alignments. However, migration

¹²⁹ GoK, “Waki Report on Post-Election Violence” Nairobi, 2008.

manifests itself from the findings as a result of environmental degradation thus promoting scramble of these precious commodities both for domestic and commercial use. On the side of the security, there is highly increase of organized gangs and crime which manifests itself through illegal logging which is more an adding contributor to insecurity and structural violence¹³⁰.

In spite of violent conflict which manifests itself in Mau complex there has been manifestation of corruption dominating exportation of high in value of Mau complex resources and this scenario, poverty and underdevelopment, weak institution as well as stagnation growth of economy. This was added by World Bank through the following statement “countries with major environmental resources have grown two to three times faster than those with high resources endowment. On top of this, underdevelopment, low income on those who depend on environmental resources like forests are ten times more likely to experience civil war and ethnic tension¹³¹”.

Population growth requires proper tools so as to address it. A wealth and health economic growth consists of a good population and it is the one which will be used in conflict transformation over environmental resources. This growing population is not empowered enough with approaches on use of environmental resources without degradation whereas conflict transformation strategies are not sufficient, lack of sufficient political good will in dealing with root causes of structural violence.

Management of environmental resources is supposed to be geared towards maintenance of law, order and harmony despite of having competition over these resources. The implication here is that conflict in Mau complex is closely linked with

¹³⁰ World Bank, “World Development Report: Conflict, Security and Development,” World Bank, Washington, DC, 2011.

¹³¹ Ibid 130.

politics of the day, Management of Mau resources and more importantly conflict managers' practitioners. It is also important to note that environmental resources do not have the mono causes of structural and violent conflict. This means that violent and structural conflict take a multi-sectoral approach. Moreover, contests and gripes over environmental resources proved to facilitate conflict and insecurity and especially when they are overlapped with other essential considerations like poverty, inequality and weak governance, ethnic balkanization and polarization. In Mau complex causes of environmental degradation regulate if a conflict will escalate to the juncture of structural and violent conflict which are intertwined with politics especially on the issue of land alienation, ethnic exclusion in access to environmental resources as well as economic costs especially when dealing with prevailing of security circumstances.

4.4 Water

Mau is a water catchment area and its degradation will mount pressure in accessing for this precious commodity. From the beginning of this millennium there has been manifestation of population growth, pollution of all forms and more so loss of diversity. From the findings it is evident that, the above factors do have implication to environmental change and in return this perpetuate inadequate access to water in many parts of the Mau complex, its environ and world at large. Due to population growth, there is high demand and degradation which hinder some population to reach this precious commodity. Moreover this growing population do compete for resources in socio-economic sectors like agriculture, pastoralism, rural and urban living. There are estimated twelve rivers which stems from Mau complex and the current population cannot be adequately supported by safe and clean water.

Due to population growth, use of water will increase at an estimated twice of the growth of the population. This implies that in order to protect Mau from degradation over conservation is supposed to be taken into consideration, especially through optimizing water which is used for agricultural purposes. This is because it purpose cause to this do create a critical challenge for population which are almost at their reaching limits. It is estimated that the pastoralism in south of Mau complex suffer from accessing water due to degradation which has contributed to the drying up of rivers.

Degradation of Mau has contributed to inadequate use in domestic and industrial practices. This entire factor contributes to water scarcity and do challenge economic growth and more importantly, growing population health and their livelihood is at stake¹³². From this foundation, UN projects that by year 2025, approximate 1.8 Billion people will be living in areas with “absolute water scarcity and two-thirds of the world’s population will be suffering from stress of water¹³³”. Access to clean, safe drinking water is a fundamental right and was adopted by UN General Assembly in the year 2010. This move is good but the measures especially to Africa and less developed nations where access to this precious commodity has been polarized by national government where in the real sense it is supposed to be an obligation to every citizen. As a result of environmental degradation and high demand of water due to population growth, this makes Mau water access more significant than ever especially as a result of variation of natural vegetation and water supply to the population.

¹³² World Business Council for Sustainable Development, UNEP, 2005.

¹³³ World Meters, “Real Times World Statistics Retrieved from <http://www.worldmeters.info/water/>. July 2016.

4.5 Environmental Change and Natural Calamities

The impact of environmental degradation in Mau complex, manifest itself through aridity desertification, calamities and disasters that perpetuate to violent conflict over reliance to environmental resources. As a result of human activities in Mau especially logging contribute to the raising of temperature, inadequate supply of rainfall, extreme natural events like famine and droughts where these factors do contribute to competition and scramble for these scarce resources and its supply.

In areas like Narok, they do experience natural calamities as a result of high-storm and this do damage Narok town structures, facilitate migration of the affected populations and more importantly the migrating population do depend on Mau complex resources like timber to reconstruct their destroyed properties. However, the impact of environmental degradation and natural calamities is supposed to be taking into a consideration of population vulnerability in Mau complex and other areas. The implication of vulnerability is that representation of highly susceptible to environment threat as well as capacity of population to struggle with natural calamities threat.

If environmental degradation can be avoided it will lower risks of natural calamities which expose the growing population inn serious impact of deteriorating their livelihood this increase their scientific adaptation methods. Moreover conflict which is triggered by environmental degradation and natural calamities, determines on the populations at providing mechanism for conflict transformation so as the impact can reduced. The finding based on natural disasters and conflict proofed the following test of hypothesis and causes of environmental degradation:

Table 4.1: Analysis Environmental Impact

Sector	Environmental Impact	Main cause(s)
ED evidence	Temperature and humidity changes	
	Rainfall changes – floods and droughts	
	Sea level rise	Temperature rise and rainfall variability
	Wind trends	Temperature change
Natural system		
	Loss of biodiversity:	
	Inland forest cover loss/ depletion	Deforestation due to demand of energy, illegal encroachment, logging and livestock grazing
	Coral reef loss	Rising sea water temperatures
	Mangrove forest depletion	Extreme droughts and flooding and siltation
	Rangeland depletion and encroachment by agriculture	Strong winds and droughts
	Land use change. (e.g., key water towers/ catchment zone)	
	Emergence of New Species of pest/diseases/plants	Temperature and rainfall variability
	Forest fires	High temperature and lengthened droughts
	Sea level rises causing intrusion of salinity of mainland fresh-water	Melting of glaciers and ice plus increase in temperature
Key economic sectors		
Agriculture	Reduced productivity:	Changes in rainfall patterns/ rainfall variability
	Low agricultural production during droughts	Changes in rainfall patterns/ rainfall variability

	Excess rain leaches key soil minerals (soil salinity) hence reducing crop production	Rainfall patterns
	Land degradation	Drought and overexploitation
	Crop infestation by pest and increased crop diseases e.g. millipedes in Mau area and Mt. Kenya	Rise in temperatures
	Crop diseases outbreak during no/ low rainfall	Low rainfall
	Bumper harvest in some pockets (+ve)	Rise in temperatures and precipitation
Livestock	Infestation/ outbreaks of livestock diseases .e.g. RVF	Temperature and rainfall variability
	Increased motility in livestock	Temperature and rainfall variability
	Reduced livestock pastures, water thus reducing livestock production	Temperature and rainfall variability
	Increased pastures during excess rains	Wind erosion, flooding and drought
	Increased nomadism, affecting agriculture land	Drought, floods and diseases
Horticulture	Reduced productivity	Changes in rainfall patterns/ rainfall variability
	Changing trends for fresh produce production	Changes in rainfall pattern
	Increased crop pests and diseases	Rise in temperatures and precipitation
Tourism	Land use change leading to diminishing natural habitat thus affecting wildlife population	Temperature and rainfall variability
	Wildlife migration searching for pastures in our neighboring countries. i.e. trans boundary biodiversity	Droughts
	Wildlife disease emergence	Droughts and floods

	Human wildlife conflict	Floods/ Droughts
	Rise in sea level (in the long run) will submerge the beaches that are tourist attraction at the coastal zones.	Temperature variability
	Tourism attraction sites have been destroyed by climate change vulnerabilities e.g. melting of ice cap at Mt. Kenya and deaths of wildlife	Temperature variability
	Destruction of infrastructure which affects tourism activities within the parks (increased expenditure on rebuilding infrastructure within the parks)	Floods
	Receding level of the inland lakes	
Forest	Forest cover diminishing	Temperature and rainfall variability
	Extinctions of forest species	Temperature and rainfall variability
	Forest diseases	Temperature and rainfall variability
	Retarded forest growth	Temperature and rainfall variability
fisheries	Reduced aquatic and marine plants (food for fish)	Temperature variability
	Reduced fish stock and species	
	Reduced fish production	Rainfall variability
Transport	Destruction of roads, bridges, railway lines.	Temperature and rainfall variability
	Disruption of transport services (maritime/ ground / air)	Temperature and rainfall variability
	Costal infrastructure instability/ weakening of underlying foundation of the roads.	Excess rain

Communication	Destruction of communication infrastructure	Floods
	Disruption of communication	Floods
Energy	Reduced Hydropower generation during droughts and floods	Siltation and soil erosion
	Damage to power infrastructure e.g. power cable during floods	Rainfall variability
	Increased damage for electricity for services like refrigeration, air conditioning and irrigation	
	Increase in wood fuel demand	
	Change of movement/ intensity/ speed of wind could affecting the generation of energy from wind	
	Increased use of petroleum products thus increased emissions	Drought
Human settlement and land use		
	Migration/ nomadism and displacement of people due to weather changes, people looking for greener pastures for their livestock	Floods and rainfall trends
	Land degradation	Droughts
	Increased human wildlife conflict due to scarce resources and competition for natural resources	
	Human conflicts due to competition of natural resources	
	Trans boundary conflicts due to competition for a trans boundary resources, e.g. water and pasture, number of people displaced/ livestock loss	
	Floods/ drought/ landslide induced deaths	

Health	Epidemic (diseases) during excess and low rainfall e.g. malaria, avian flu, cholera, malnutrition	Floods
	Over stretching of health infrastructure	
	Increased sectoral expenditure	Drought
	Increased mortality rates	Temperature increases

Source Kenya National Bureau of Statistics, June 2012.

From the research findings we can see the population from year 2000 is increasing and population becoming vulnerable to the effects of environmental degradation and wildlife too and this is exposing all too extreme unnecessary calamities. On the other hand, this can be slowed down through maintenance of peace, stability and order so as the growing population can live harmonious with environmental induced risks like migration as well as scramble of forest resources.

4.6 Water Catchment Area

According to UN which was set, endorsed by governments in 2010 through Nagoya Protocol, it is important to commit at least seventeen per cent of lithosphere and the significance for the “biodiversity and ecosystem”¹³⁴services. Protection of Mau is key due to its composition of richness in materials and other relevant wealth which support the livelihoods of many especially the growing population. This means that plantation of indigenous species if exercised even the influx of rural-urban migration will lack precious commodities like water but degradation will lender area desert and

¹³⁴ CBD, “A New Era of Living in Harmony with Nature is born at the Nagoya Biodiversity Summit”, UNEP, Montreal, 2010

this means that the security of both rural and urban residents will be experiencing economic costs and hardships¹³⁵.

As a result of population growth, high demand of forest resources the water catchment areas becomes a theater of threatened conflict. The implication here is that local threats are very difficult to cope with them by the government and this is as a result of pollution, migration of wildlife and people, fragmentation of habitat just to mention a few. Some of these threats are going in a higher note in the coming future as the population continues to grow. Interestingly, over eighty percent of the causes of environmental degradation has facilitated violent conflict and at the same time this has threatened environment¹³⁶. Lack of sensitivity to the growing population has threatened environment especially protected areas where Mau has been transformed into an ‘economically productive’ theater through use of land especially infrastructure, pastoralism and farming. The basis of this argument is that lack of sufficient understanding of ecosystem and its services. At the same time, the local might be contented with little remuneration that they receive through agriculture for example but the huge loss of environmental degradation is so much affecting population living miles away from Mau complex.

The emergence of restoration of Mau and compensation of evictees raised eyebrows to so many actors and stakeholders. Where the water catchment areas are supposed to be protected and the encroachers are prosecuted according to community that exercise pastoralism. This means that environment provide several measures of use of land where Mau as a protected and rehabilitated tower, some communities

¹³⁵ UNEP, “Protected Areas in Today’s world: Their Values and Benefits for the Welfare of the Planet” UNEP, Nairobi, 2008.

¹³⁶ Hanson, T., “Books Warfare in Biodiversity Hotspot” *Conservation Biology*, 23 (3). 2009, pp. 578-587.

should not gain access and livelihood while others do suffer at the pretext of illegal timber harvesting, and encroachment of human population with wildlife through industrialization.

4.6.1 Demand of Timber

High demand of timber to support urban constructions facilitates deforestation in an alarming rate. This has contributed to the decline of Mau complex vegetation. As deforestation takes place, erosion is high thus leading to overflowing of rivers especially Nzoia. This overflow increases risks of human population and exposes them to natural hazards.

4.6.2 Education

Education goals should be promoted to ensure environmental sustainability. This will lead to realization of economic growth. This means that primary and secondary schools should have a certain literacy level of environmental conservation and they are supposed to be encouraged because of huge population of respondents who were below the age of 25 they had no clue of environmental protection. This will lead to 'poor governance' maintenance of the environment in the next couple of years.

4.7 Conclusion

Giving consideration of the above findings and their discussion, it is important to note that different causes and effects are very important in examining that impact of environmental degradation in Mau complex and its sustainability. More importantly, the finding proves the second hypothesis that environmental degradation seems to be a key regulator on security and violent conflict in different levels of the society. The findings also shows that industrialization is making economic gained in terms of development but this is supposed to be taken in to consideration with environment. At

the same time the third hypothesis has been proved that is violent conflict has negative implication on security, socio, economic and political stability. Finally we have noted that impact of environmental degradation is comprehensible and it needs to be resolved for holistic growth.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Mau complex is a water tower with a holistic growth and development but due to its degradation has triggered violence which has led to high increase of poverty and unemployment. However security of human population, wildlife and vegetation is at stake as a result of development hence a need to securitize environment.

In this regard, as per the objectives, this given research was conducted to examine the link between environmental degradation and violent conflict in Mau complex. This research tried to examine reasons why impacts of environmental degradation trigger conflict thus stalling national growth and this leave a good number of populations without access to basic needs. In a nutshell, this chapter will summarize what has been found out since the beginning of this research and provide recommendations and general conclusion.

5.2 Summary

This research has discussed impact, cause, violent conflict and security of environmental degradation in Mau complex. As for environmental sustainability, impact of environmental degradation will have severe effects in the next fifty years as this will lower GDP, poor population, aridity, desertification, global high rate of extreme poverty, unemployment just to mention a few. As Africa, has substantial degree of natural resources like water towers, it is vital to protect them for the sake of coming generations. The concept of forest resources exportation is supposed to be regulated so as to make the growing population secure. On the other side, economic

development cannot be realized in a situation which is confronted by perennial conflict and security agencies should foster outstanding indicators to protect lives of people and properties. It was noted that the population growth contribute to the wide disparity in resource allocation, insecurity, violent conflict as a result of scramble of these resources.

In line with objective one, the study has comparatively analyzed the causes of environment and security in Mau complex. It emerged that Mau is rich in Natural resources and it is a source of livelihood to many. It was also found that the resources in Mau do not explain the difference between security and environmental degradation, proving the first hypothesis. On top of this the study further examined the impacts of environmental degradation in so doing, the study looked direct economic impact, responsive and behavioral. Mau complex degradation has led to destruction of land, marine, promoting desertification and aridity. Besides, there are more serious challenges related to sociopolitical and economic development. Whereas these resources are supposed to foster an outstanding development in the area of environment.

Further, in line with three and four objectives of the study, the study examined policy process, different actors, dynamic in leadership in protection of Mau so as to protect Mau complex. The study found that the aforementioned played key roles in protection of water catchment areas. The study found that poor politics and ethnic blackmail cannot promote economic development other than a hindrance to the realization of growth and development. Good governance is supposed to be exercised so as to uplift the weak institutions of governance and social ills like corruption, tribalism and favoritism, have failed to provide a conducive environmental protection and therefore it is key to manage diversity. As population growth goes hand in hand

with innovation and creativity, industrialization is supposed to be environmental friendly which seems to prove the second hypothesis. However the study found that impact of environmental degradation has negatively affected economic growth and this escalates violent conflict over these resources. This proves the last hypothesis.

5.3 Conclusion

The study found that there are various causes that contribute to environmental degradation hence a hindrance to an egalitarian society and economic, social-political development. Firstly, is population growth: there have been positive efforts aimed at enhancing environmental security; however these efforts may not achieve the intended success for several reasons. The methodology adopted to fight environmental degradation may not be wholly appropriate in so far as does not take account of the underlying causes. Most of the interventions are purely political in character and might not provide long lasting solutions to the impact of environmental degradation. The security of this growing population is addressed at the end of spectrum. Whereas without addressing the root causes of environmental degradation and security, the two threats will continue evolving with perpetrates devising novel aridity and desertification thus subject population to sever dangers. The interventions must strive to address the challenges that contribute to the increase of environmental insecurity especially which fall within their mandate.

Kenya and other east-African nations must own treaties and conventions of efforts ratified by ensuring that the protocols adopted to curb environmental degradation and security are domesticated and enforceable at all levels of governance. It is also important for the treasury to be willing to commit the financial resources necessary for implementation of such treaties and conventions where also political good will is

required. It is also key to note that despite the challenges faced by the growing population as a result of environmental degradation, prosecution of culprits of environment must face the full force of law.

There is inadequate capacity in terms of intervention and personnel to deal with environmental degradation and security. This it is important to increase budgetary allocation for training both at county and national levels. Establishment of national and county center of excellence in environmental training could ensure that the training dose not impose unnecessarily high costs on national government. The international community through UN should assist to build capacity of regional state to meet their environmental security requirements. Since local solutions are likely to be more effective and sustainable, providing regional state with more and better coordinated assistance to build their capacity for environmental security and operation would constitute a very important step forward.

5.4 Recommendations

In respect to the above findings, this research makes some suggestions for the achievement of sustainable socio-political and economic development. Firstly, implementation of international treaties, conventions and protocols dealing with environment thus this will lead to higher economic growth and it is recommended that county and national governments support the implementation of environmental intervention as the study has proved.

It is important to adopt several mitigations and means that could be added to the formulation and evaluation model on environment. These include among others; waste recycling and reuse to avoid pollution of all forms, transport which is environmentally friendly and especially to O-zone layer and more importantly integrate the key pillars

of Kenya Vision 2030. National government through the ministries of water and irrigation, National Resources and Environment, should design key strategies to foster the overall development and resilience of the socio-political and economic growth.

Thirdly, environmental degradation will affect the realization of country's development goals. In this regard, it is important to policy and regulation on environment be put into place and enforced.

Construction of large dams and their maintenance, should give into consideration of water scarcity and this is for example exploitation of deep aquifers and artificial reaching of aquifers under the irrigation sub-sector. At the same time, the health related intervention as this is a threat to human security, is supposed to be looked into.

Afforestation is supposed to be conducted and encourage power producing agencies to be using concrete posts so as to avoid lodging and at the same time be in a position to store carbon sink.

There exists opportunity in building complementarities between environmental factors and security. For instance, it can be used to improve on Environmental Impacts Assessments (EIA) as well as its audit. Currently, EIA are based on the prevailing situations in terms of resources and environmental conditions.

5.5 Suggesting an Area of Further Study

This research suggests that further correlational and cooperative studies on environmental degradation and security which influences the securitization of environment thus get more lessons on sustainable socio-political and economic development.

BIBLIOGRAPHY

- AEA, "Technology PLC Kenya: Climate Change Securing Information and Exchange"
London, DFID, 2008.
- Ayub, M., "Poverty and Inequality", *Global Journal of Emerging Markets Economics*,
Vol. 5, No.3, 2013. P330.
- Collier P& Gunning J.W., "Explaining African Economic Performance", *Journal of
Economic Literature*, Vol. 37, No. 1 (1999) p. 74.
- FAO, "Pastoralist: Playing a critical role in Managing Grassland for Climate Change
Adaptation" FAO, Rome, 2009.
- Galtung, J., "Cultural Violence, *Journal of Peace Research*," 27(3), 1990, pp. 297-305.
- GoK, "Natural Climate Change Strategy", GoK, Nairobi, 2010.
- GoK, "Report on Strengthening Institutional Capacity for Integrated Climate Change
Adaptation and Comprehensive National Development in Kenya", Ministry of
State Planning, National Development and Vision 2030, Nairobi, 2012.
- GoK, Economic Survey. "Kenya National Bureau of Statistics, Nairobi 2015.
- Graeger; N. "Environmental Security" Vol. 33 No 1 Sage Publication pp 109-119,
1996.
- Harwell, E., Farah &D., B "Forests, fragility and conflict: overview and Case
studies", World Bank, Washington DC, 2011.
- Homer-Dixon, T., "On The Threshold: Environmental Changes as Cause of Actual
Conflict *International Security*" 16 (2):76-116, 1991.
- Homer-Dixon, T., "Environmental Scarcity and Violent Conflict: Evidence from Cases
International Security", 19 91), 1994, pp. 5-40.
- IPCC, "Climate Change: Impact, Adaptation and Vulnerability: Cambridge:
Cambridge University Press, 2007.

- Jerome A., “Infrastructure, Economic Growth and Poverty Reduction in Africa”,
Journal of Infrastructure Development, Vol. 3, No, 2 (2011) p. 146.
- Kabuko- Mariara, J& Karanja, F.K., “The Economic Impacts of Climate Change on
Kenya Crop Agriculture”, World Bank Policy Research Working Paper 4334,
1-40 pp.1-40.
- Kerr, S., et al. “Effects of Poverty on deforestation: Distinguishing Behavior from
Location” Rome, FAO, 2004.
- Mui, S.M., & Kibe, A.M., “The Effects of East Africa Low Level Jet on Food
Security in Horn of Africa”, A case study of coastal Region of Kenya Afri J.
Food Agri. Nutr-dev.9,1776-1777, 2009.
- Myers; Narman., Environmental and Securing Foreign Policy”, No. 74 pp 23-41, 1989.
- Nga’nga’, J.K., “Climate Change Impacts, Vulnerability and Adaptation Assessment in
East Africa. UNFCCC Africa Regional Workshop on Adaptation”, Accra,
Ghana, 2006.
- Onyenwigwe P.I., “Principles of Development Administration: Third world
Perspectives”, Owerri: Anbix Printers, Nigeria, 2009.
- Renner., M., “National Security. The Economic and Environmental Dimension”,
World Watch institute Paper Washington DC, 1989.
- Richard, Cronin., & Amit Pandya. “Exploiting Natural Resources, Growth, Instability
and Conflict in the middle east and Asia”, Washington DC, Henry L. Stimson
center, 2009.
- Sachs, Jeffery D; Warner, Andrew M, “Natural Resources Abundance and Economic
Growth”, NBER Working Paper5398, 1995-02-02. Retrieved on 17th January
2016, from <http://ideas.respec.org/p/nrb/nberwo/5398.html>
- Stockholm Environmental Institute. Economies of climate Change in Kenya,
Stockholm Environmental Institute, 2009.
- UNESCO, “second World Development Report. United Nations Economic Scientific
and Cultural Organization, Paris, 2006.

United Nation population Fund, “The State of the World’s midwifery Analysis”,
retrieved on 17th February 2016 from
<http://www.unfpa.org/sowmy/report/home.html>

Wass, P., (ED). “Kenya Indigenous Forests: Status, Management and conservation”,
IUCN, Gland, Switzerland and Cambridge, UK. 205pp 1995.

Wirth, D., “Climate Chaos Foreign Policy No 74 pp 323; and Neville Brown Climate,
Ecology and International Security, Vol 31 No 6, pp 519-532, 1989

APPENDICES

APPENDIX 1: LETTER OF INTRODUCTION

Date...../...../2016

TO WHOM IT MAY CONCERN

Dear Sir/ Madam,

Request for data collection

My name is **Simon Mungai Muiruri**, a Master's degree student at the Institute of Diplomacy and International studies, College of Humanity and Social Sciences, University of Nairobi.

I am conducting a research study titled **“IMPACT OF ENVIRONMENTAL DEGRADATION IN SECURITY A CASE STUDY OF MAU COMPLEX”**.

You have been selected to form part of this study.

Kindly assist by filling in the attached interview guide. The information will be treated in strict confidence and will be purely used for academic purposes.

Your assistance and cooperation will be highly appreciated.

Yours sincerely,

SIMON MUNGAI MUIRURI

R52/73845/2014.

APPENDIX II- CONSENT FORM

Title of the study: “IMPACT OF ENVIRONMENTAL DEGRADATION IN SECURITY A CASE STUDY OF MAU COMPLEX

Learning Institution: Institute of Diplomacy and International Studies, Faculty of Arts, School of Humanity and social sciences, University of Nairobi, P.O. BOX 30197-00100, NAIROBI.

Researcher: SIMON MUNGAI MUIRURI.

Supervisor: Professor Peter M. Kagwanja.

Ethical Approval: University of Nairobi Ethical and Research Committee.

Permission is requested from you to participate in this research study. With principles that you: voluntarily agreement to participate in this research study is voluntary.

May wish to withdrawal from the study at any point you deem fit.

May seek clarity to understand the nature and importance of this study.

Purpose of the study: is to examine the Impact of Environmental degradation and security in Mau complex and what causes this and who are the actors.

Procedure to the followed: with your cooperation, you will answer questions related to the objectives of this study. All information obtained will be handled with confidentiality.

Risks: There will be no risks involved in this study to you.

Benefits: there may be no direct benefits to you but the result of this study will be useful in examining the impact of environmental degradation, and find out hoe effects influence aridity and state of insecurity.

Assurance on Confidentiality: All Information obtained from you will be kept confidential and used for the purpose of this study only.

Contacts: You may wish to contact me with regards to issues concerning this study through any various addresses provided above.

I now request you to sign the consent form attached.

CONSENT FORM

“Impact of environmental degradation and security in Mau Complex”

I _____ (participant) give
consent to the researcher to use the information that I will provide him as a part of his
study and that the nature of the study has been explained to me by the

.....

Signature _____ Date _____

I (field agent/ Researcher) confirm that I have explained the nature and the effect of the
study.

Signature _____ Date _____

APPENDIX III –INTERVIEW GUIDE

Tick and fill as appropriate

1. Name (optional) _____
2. Gender Male { } Female []
3. What is your age? _____
4. Name of your organization _____
5. What is your period of experience in the organization _____
6. What is your area of specialization _____
7. Highest level of education _____
8. In your own thinking what factors do you think facilitate environmental degradation
9. What are the possible causes that impact environment and derail socio-political and economic growth?

10. In line with industrialization and Kenya vision 2030 what do you think are the possible effects to environment? _____
11. What is your understanding on the current population and do you foresee any danger in the near future?

12. How effective in your own assessments some households to meet their basic necessities?
13. What measures do you think are favorable to be domesticated to avoid destruction of environment? _____
14. What do you use as a source of energy in your household?

15. Do you think the security of our future generation is threatened Yes [] No []
16. Explain your answer from number 15 above _____
17. Do you think government agencies are doing enough to curb environmental insecurity? _____
18. What recommendation can you make to avoid environmental degradation and security? _____