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INSTITUTE OF DIPLOMACY AND INTERNATIONAL STUDIES

**ENVIRONMENTAL RESOURCE SCARCITY AS A SOURCE OF CONFLICT IN
THE HORN OF AFRICA; A CASE STUDY OF THE MAU FOREST IN KENYA**

MA PROJECT PAPER

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DECLARATION

This research project is my original work and has not been submitted to any university for examination purposes.

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Signature Date.....

This research project has been submitted for examination purpose with my approval as University Supervisor.

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Signature Date.....

DEDICATION

I dedicate this project to my beloved wife Betty and my children Kate, Kellyn, Kevin and Konrad for their love and support, friends and all those who contributed to its success.

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I take this opportunity to acknowledge the professional support and guidance of my supervisor Dr. Shazia Chaudhry, whose direction was inspiring and vital throughout the entire research. I would also like to acknowledge the University of Nairobi for providing a wonderful learning environment. I wish to extend my special gratitude to my dear family for giving me moral support and co-operation all through. Finally, I would like to thank all those who in one way or the other contributed to make this research project a success.

ABSTRACT

This research endeavors to establish how environmental scarcity is connected to the conflicts in the Horn of Africa. It is centered on three specific objectives, the first one is to identify the causes of environmental resource scarcity related conflicts in the Horn of Africa and the second one is to establishing the extent to which environmental diplomacy has been adopted in resolving environmental related conflicts. The third objective looks at the effectiveness of the conflict mitigation measures employed to manage the conflicts in the Horn of Africa as well as in the Mau forest complex. This research is anchored on two theoretical models, environmental scarcity model and the environmental diplomacy model. The environmental scarcity model is aligned to Homer-Dixon's book *Environmental Scarcity and Violent Conflict: the case of Rwanda* while the environmental diplomacy model looks at how it has gained prominence due to adverse environmental problems that befell the world in the recent past. The research targeted a sample population of 30 interviewees that were drawn from forest management agencies, forest enterprises, and households in study area. This study used both quantitative and Qualitative analysis methods to assess and explain research objectives. The findings indicate that destruction of the Mau forest is a threat to regional security because of the effects caused by the erratic weather changes. Riparian countries that depend on water from the Mau forest are afraid that they will be hit by water shortages if the destruction continues. The Kenyan economy has also been affected through the tourism industry. Flamingoes are now moving to the neighboring country due to insufficient food in the Kenyan lakes. It was also evident that sustaining the restoration of the Mau complex, was dependent in the involvement of the local communities in decision-making.

TABLE OF CONTENTS

Declaration.....	i
Dedication	ii
Acknowledgements.....	iii
Abstract	iv
Table Of Contents	v
List Of Tables	x
List Of Figures	xi
List Of Abbreviation.....	xii
CHAPTER ONE	1
1.1 Introduction.....	1
1.2 Statement of the research problem.....	2
1.3 Objectives of the study.....	3
1.4 Literature review	4
1.5 Research gaps.....	14
1.6 Justification of the study	14
1.7 Hypotheses.....	15
1.8 Scope and limitation of the study.....	15
1.9 Theoretical framework.....	15
1.10 Research design and methodology.....	17
CHAPTER TWO	21
2.0 Introduction.....	21
2.1 Resource scarcity related conflicts in the horn of africa.....	21
2.2 Environmental conflict and scarcity	22

2.3 Environmental changes and land cover degradation	25
2.4. Common property rights in forest management in the horn of africa.....	26
2.5 Management of natural resource conflict	28
2.6 Environmental conservation and conflict management.....	30
2.7 Using regional bodies to manage environmental related conflicts in the horn of africa	33
2.8 Chapter summary	33
CHAPTER THREE:	35
3.0 Introduction.....	35
3.1 Resource depletion and degradation as a source of conflict in the mau	35
3. 2 Factors encouraging encroachment in the mau forest.....	36
3.3 Mau forest conservation strategies.....	37
3.4. Development of effective institutional framework and strategic management plan	38
3.5 Approaches to the management of natural resource-based conflicts in the mau forest.....	40
3.6 Key challenges	44
3.7 Conclusion	47
CHAPTER FOUR:	48
4.1 Introduction.....	48
4.2 Demographics	48
4.3 Environmental concerns.....	49
4.4 Non- environmental concerns	50
4.5 Environmental Diplomacy In The Mau Forest.....	52
CHAPTER FIVE	57
5.1 Summary	57
5.2 Conclusion	58
5.3 Recommendations.....	59

Bibliography	61
Research Questionnaire	66

LIST OF TABLES

Table 1.1 Population of the Study.....	18
Table 4.1 Environmental concerns	50
Table 4.2 Non- Environmental Concerns	51

LIST OF FIGURES

Figure 2.1: Glasl's model of conflict	12
Figure 2.2: sources of environmental scarcity	16
Figure 4.1: duration of living in the Mau complex	48
Figure 4.2: Awareness of environmental or resource related conflicts in the Mau Forest	49
Figure 4.3: Environmental diplomacy adopted in the Mau	53

LIST OF ABBREVIATION

CFA	- Community Forest Association
IDIS	- Institute of Diplomacy and International Studies
KFS	- Kenya Forest Service
MFC	- Mau Forest Complex
MFCA	- Mau Forest Complex Authority
TF-MFC	- Task Force for the Mau Forest Complex
UN	- United Nations Organization
UNEP	- United Nations Environmental Program
UNODC	- United Nations Office on Drugs and Crime
USAID	- United State Agency for International Development
CEMIRIDE	-Centre for Minority Rights Development
USA	-United States of America
MRG	-Minority Rights Group International
COHRE	-Centre on Housing Rights and Evictions
ACHPR	-African Commission on Human and People's Rights

CHAPTER ONE

INTRODUCTION TO THE STUDY

1.1 INTRODUCTION

Natural resources such as land has cultural and historical aspects attached to it. They are also a source of wealth and one of the drivers to a community's growth and development. These associations have been known to be a source of tensions that sometimes lead to conflicts between communities. Individual or group economic and sometimes political interests fuel most of the conflicts that emanate from natural resources. Conflicts that take a political dimension have always led to instability as seen globally and particularly in the Horn of Africa.

The environmental scarcity school of thought argues that conflicts arise when parties contest for the control over declining natural resources and that this is made worse when the population is high. Developing nations that have a great number of poor societies are deemed more at risk because of their inability to protect themselves environmental pressures¹. The argument is that environmental scarcity can occur in three dimensions; supply-induced scarcity, that is mainly because of depletion and degradation of natural resources; demand-induced scarcity is said to be caused by high population and structural scarcity that is because of unequal distribution of state resources².

When the availability of resources goes down, scarcity kicks in and the commodity becomes more valuable. This increase in value increases the appetite to take full control of the resources which then makes the commodity scarcer than before. Population increase also causes a rise in demand as competition for the same resource increase in line with the population. This also causes pressure on the ecological environment to produce more resources for the population.

In the Horn of Africa, human well-being is endangered by the ever-growing shortage of natural resources. As resource scarcity increases, the population in this part of Africa (Eritrea,

¹ Percival, V., & Homer-Dixon, T. (1998). Environmental Scarcity and Violent Conflict: The Case of South Africa. *Journal of Peace Research*, 279-298.

² *ibid*

Ethiopia, Djibouti, Sudan, Kenya, Somalia and Uganda) has been growing at a very high rate in the past fifty years and continues to grow rapidly. Families who are practicing arable farming have more mouths to feed but less land to till for food production.

According to Homer Dixon, demographic changes, ravages of time and disgrace of environmental basic material, issues of access and ownership of resources such as land are presently some of the most problematic issues that may worsen in the future³. There is evidence that the entrenchment of the colonial powers in Kenya led forthwith to violation in land ownership and use. Landlessness, squatting, land degradation and resultant poverty became the order of the day. This then graduated to conflicts that expend from antithetical causes; historical land injustices, inept regulatory framework, proliferation of simple urban settlements, unsound land management practices and human wildlife land conflicts. As populations multiplied, land became scarce and thus generated conflict. The Akiwumi commission report of 1999 found out that tensions in the Rift Valley began as early as 1957⁴. The report noted that the constitutional liberty to own land anywhere in Kenya is merely de jure, and that it does not exist on the ground.

Tropical forests on the other hand provide resources such as timber and is critical for water catchment. These forests are currently under severe stress from humans because of issues such as population pressures⁵. Deforestation in the Mau has become indeed aggressive because of an agglomeration of factors that include social dynamics, power and politics. This mixture has made the conservation process hard and complicated.

1.2 Statement of the Research Problem

Environmental related conflicts have increased in the past decade all around the world. This has been attributed to dwindling natural resources, increasing populations and unpredictable weather patterns. Since the 1950's Israel has been fighting its neighbors because of the Jordan River waters. This has escalated as the water resource becomes more scarce. Land has also been at the center of many conflicts, a good example being Ecuador and Peru over their

³ Homer, D. (1999), *Environment, Scarcity and Violence*, Princeton University Press, p 177

⁴ Akiwumi Commission (1999) *Report of the Judicial Commission of Inquiry Appointed to Inquire into the Tribal Clashes*. Available on line at www.scribd.com. Accessed on 3 April 2011.

⁵ Klopp, J., Sang, J. (2011). Maps, Power, and the Destruction of the Mau Forest in Kenya. Retrieved January 6, 2016, from <http://www.columbia.edu/~jk2002/publications/KloppS11.pdf>

border, Rwanda, Kosovo, east Timor and many others. All these conflicts are linked to scarcity of natural resources.

The conflicts affecting the communities living around the Mau forest are getting worse. Reports on the encroachment of the Mau by squatters in the past few years have been alarming and detrimental to the livelihoods of communities that depend on this water tower. Tensions have been growing between the Kipsigis and the Maasai communities because the Maasai are worried that destruction of the forest will lead to drying up of rivers that emanate from it. This is well supported by Leif Ohlson⁶ who warns that severe shortages of freshwater reserves are imminent, and predicts that violent conflicts will emerge in water-scarce regions. Homer Dixon then expands on this by saying that water scarcity has been known to lead to civil conflict especially when combined with high population density and poverty. He adds that communities whose adaptation to environmental scarcities is not well formed make this worse⁷.

In the recent past skirmishes between the Kipsigis and the Maasai in Narok North have been experienced. This has been attributed to both politics in the Maasai dominated constituency and scarcity of natural resources in this case agricultural land. The researcher therefore saw it adequate to do an indebt analysis of the conflicts that have been experienced in the Mau forest and understand the role played by the environment in the conflicts that have affected this region. Having understood the role of environment, the researcher's aim is to making it a factor of change towards resolving the conflicts. The following research questions will guide the study; To what extent does environment contribute to conflicts in the Horn of Africa and especially in the Mau forest complex?;To what extent has environmental diplomacy been adopted in resolving environmental related conflicts?;What mitigation measures have been employed in managing the conflicts in the horn of Africa?

⁶ Ohlsson, L. (2002). Water and conflict. Retrieved January 6, 2016, from <http://www.eolshttp://www.eolss.net/Sample-Chapters/C07/E2-24M-04-02.pdf>

⁷ Homer, D. (1999), *Environment, Scarcity and Violence*, Princeton University Press.

1.3 Objectives of the Study

The main objective of this study is to find out the linkage between environmental resource scarcity and conflicts in the Horn of Africa, using the Mau forest as a case study. Other objectives include;

- i. To identify the causes of environmental resource scarcity related conflicts in the Horn of Africa.
- ii. To establish the extent to which environmental diplomacy has been adopted in resolving environmental related conflicts.
- iii. To assess the effectiveness of the conflict mitigation measures employed to manage the conflicts in the Horn of Africa as well as in the Mau forest complex.

1.4 Literature review

1.4.1 Environmental resource scarcity as a source of conflict

A study conducted in Cambodia, demonstrated that the rampant conflicts between communities residing inside and outside the forest are because of inadequate resource allocation and illegal harvesting of forest resources. In the case of Indonesia, furthermore, vague natural tenure rights are one of the main problems causing conflict. In addition, unfair distribution of resources between government, private companies and local communities will be extremely hard to solve because the government has an upper hand. A good example is how government agencies are allowed to exploit large chunks of land in the forested area while the local community has very little to exploit⁸.

The 1994 Rwanda conflict that ended up becoming a genocide can be seen as a conflict created by natural and demographic variables, which combined to cause a full-blown war. Rwanda as a state depends intensely on farming consequently it is powerless against ecological corruption and populace development. Natural resource depletion and high population added to relocation, decreased agrarian profitability and the debilitating of the popularity of then Rwandan president. The connection of every one of these variables

⁸ Bavinck, Maarten, Lorenzo P. Erik M. (2014) *Conflicts over Natural Resources in the Global South*. Retrieved 21 August 2016, from <http://dare.uva.nl/document/2/134504>

assumed an enormous part in starting the contention that became one of the worst genocides ever⁹.

An example of violent conflict that may be coupled with resource scarcity is the conflict between Honduras and Salvador governments. The Honduran government panicked regarding the comeback of massive numbers of landless and restless peasants from Salvador. In response to this invasion, Honduras government threatened to expel Salvadorian migrants. The government of Salvador responded by invading Honduran territory ensuing to what has been called the football game war in 1969. This case will sum up conflicts heightened by growing demand of cropland. Land became scarce hence; the war had nothing to do with ethnic divisions between the two states¹⁰. Resource scarcity occurred due to inflow of migrants, which caused an accumulated demand for cropland. The accumulated population caused demand-induced insufficiency. Structural insufficiency conjointly caused the conflict. The unequal distribution of resources affected the less powerful within the society. This was a classic example of violent conflict that may be coupled with resource depletion and degradation as it happened between Honduras and Salvador. The later had pressing want for land that culminated into several clashes on the border. Within the 1960's, a big fraction of Salvador's population failed to own any land thanks to monopoly by some families. Honduras on the other hand was less inhabited with additional land and it became the destination of Salvador's emigrants¹¹.

Another violent conflict, which can be used to demonstrate the role of environmental scarcity, is the conflict in Chiapas, Mexico. In this case, Environmental deficiency did not cause the conflict directly, but it interacted with different factors, which created a fertile ground for conflict¹². Forests play a very important role in stabilizing ecological factors. It maintains the storage of water, it regulates the flow of water over the ground surface and acts a preventive measure to flooding. It also helps in reducing soil erosion and thus reducing siltation into water bodies. All these factors help in regulating the climatic conditions and

⁹ Nabutola.W. (2010). *The Mau Forest in the Rift Valley: Kenya's Largest Water Tower: a Perfect Model for the Challenges and Opportunities of a Sustainable Development Project?* Retrieved 21 August 2016, from https://www.fig.net/resources/proceedings/fig_proceedings/fig2010/papers/ts02e/ts02e-nabutola_4755.pdf

¹⁰ Durham, W. (1977) *Scarcity and Survival: The ecological origins of conflict between El Salvador and Honduras*, (The University of Michigan, Ann Arbor, 1977).

¹¹ *ibid*

¹² Howard. P. Homer.D. (1994) *Environmental Scarcity and violent conflict: The case of Chiapas, Mexico*, university of Toronto.

thus support most of the major economic sectors within the Mau region. The most important being agriculture and hydropower production¹³.

Omoruyi A. Aigbe in his paper conflict and poverty in Africa: the effect of natural resource and leadership: points out that conflict is rooted in a variety of factors, which include socioeconomic and political. However, he says that recent research has brought out a relationship between conflict and poverty. Poverty may be because of prolonged conflict that led to the destruction of livelihoods¹⁴.

These findings are in line with the research done by the United State Agency for International Development (USAID) in Nepal where the society is hierarchical. According to the report, there is a lot of inequality based on ethnicity and gender, which are held firm by culture and religion. The report points out that the disparities range from the inability to access resources, government services and other economic activities. This led to resentment by the poor communities, which led to an underground movement that toppled the Monarch mode of governance and replaced it with a multiparty system. Other researchers like Kvitashvili argue that logging and poor governance causes forest conflicts. Most loggers tend to come from outside the community living around the forest and thus are foreigners. This therefore leads to a conflict between the local inhabitants and the outsiders who are usually referred to as the forest destroyers¹⁵.

Yurdi Yasmi looks at the Asian cases and agrees that natural resource conflicts occur due to deep-rooted societal issues such as poor coordination between state agencies, inconsistent tenure policies and a great difference between economic development and conservation. Economic conditions of the local communities are extremely low and therefore they tend to over rely on natural resources. This overdependence is made worse by poor distribution of forest resources, which leads to emergence of conflicts amongst various actors¹⁶.

In the case of Vietnam, tensions emerged when private owned companies started harvesting sand from the fringe forest. This was a direct cause of water shortage especially for small-scale farmers who needed the water for irrigation. The failure by the private companies to compensate the peasant farmers and the local communities has led to conflicts because of lost

¹³ Kipkoeh.A. etal (2016). Repository.eac.int. Retrieved 22 September 2016, from <http://repository.eac.int/>

¹⁴ Aigbe, O. A. (n.d.). Conflict and poverty in Africa: the effect of natural resource and leadership. Retrieved August 17, 2016, from http://www.academia.edu/7775590/conflict_and_poverty_in_africa_the_effect_of_natural_resource_and_leadership

¹⁵ Kvitashvili, E. (2016, 01). Forests & Conflict. Retrieved 01, 2016, from http://pdf.usaid.gov/pdf_docs/PNADE290.pdf

¹⁶ Yasmi, Y. (2006) "Understanding Conflict In The Co-Management Of Forests: The Case Of Bulungan Research Forest". *Research Gate*. Retrieved on 17 Aug. 2016.

livelihoods. This has made the local community poorer with time because their ability to access the scarce natural resources is diminishing every passing day¹⁷.

Similarly, W. de Jong and others studied communities living in forested areas in Northern Bolivia and found out that the cause of conflict were as a result of overlapping claims, poor and inconsistent forest allocation policies, weak law enforcement policies as well as agencies and lack of coordination amongst state agencies . They found out that the main reason for the conflicts was disrupted livelihoods that were caused by poor distribution of resources¹⁸.

Equally, Koning and other researchers asserted that the main causes of conflict between concession holders and the local communities were because of restrictions pertaining to access

to the forested areas, poor distribution of forest resources and exclusion of the local communities when making important decisions¹⁹. They go further by examining the conflicts in northern Thailand and found out that disruption of livelihoods unclears compensation criteria and illegal extraction of natural resources as the main causes of conflict²⁰.

Correspondingly, Phuc did a research on the failure of forest conservation policy in Vietnam. The research found out that there was a conflict between conservationists and communities living in forested areas. The conflict was because of poor distribution of resources and lack of a powerful voice from the local community. This is depicted by the fact that the conservationists have been excluding the local community in important decision making concerning the development of conservation zones. To make the matters worse the conservationists have been trying to move indigenous communities out of the forests with an aim of enriching individuals. The research found out that the conservationists preferred to lease forested land to contractors who paid high prices. This leaves the local communities with little else to do other than fight for survival²¹.

Furthermore, Julien Gerber in his research, *Conflicts over Industrial Tree Plantations in the South* asserted that any biases in distribution and access to natural resources have been a

¹⁷ ibid

¹⁸ Jong, W. (2016). *Future Scenarios as a Tool for Collaboration in Forest Communities*. Retrieved on 01, Aug 2016, from <http://sapiens.revues.org/209>

¹⁹ Koning , R. (2016, 01). Sustainable Forest Management for Peace Building. Retrieved 01, 2016, from <http://www.un.org/esa/forests/wp-content/uploads/2015/06/SFM-for-PeaceBuilding.pdf>

²⁰ Hares, Minna.(2008) "*Forest Conflict in Thailand: Northern Minorities in Focus*". Environmental Management retrieved on 17 Aug. 2016.

²¹ Phuc , T. (2016, 01). Why did the forest conservation policy fail in the Vietnamese uplands? Forest conflicts in Ba Vi National Park in Northern Region. Retrieved 01, 2016, from <http://www.tandfonline.com/doi/abs/10.1080/00207230902759988?journalCode=genv20>

source of conflict in many parts of the world. He asserts that most resistances are related to corporate control over land, which leads to displacement of populations. In such cases, authorities have always responded by use of repressive force. The local communities also contribute to the conflict through illegal forest operations. The authorities on the other hand are unable to act because of lacking sufficient personnel to patrol and stop illegal activities in the forested areas²². Conflict in Asian and the Pacific indicated that notions caused most conflicts over forest resources. This comes about because local communities depend on the forest for sustenance while the government and multi-national corporations looks at it in terms of finance. On the other hand the multi-national corporations depend on the forest to extract both timber and non-timber resources to sustain their revenues. Therefore the livelihoods of the local populations are never considered, this generates tensions that may progress into full-blown conflicts if not addressed²³.

Further, Emma Wilson's research on *Company-Led Approaches to Conflict Resolution in the Forest Sector* found out that forest related poor governance, unclear policy regulations and lack of proper negotiation capabilities caused conflicts. The research also corroborated results of other researcher when it found out that disruption of livelihoods was the main factor that led to conflicts amongst the local communities. On the other hand, corporations also fight to sustain their financial capabilities through forest resources²⁴.

A research United State Agency for International Development (USAID) in 2006 found out that the degree and severity natural resources conflicts in Nepal were because of poor tenure policies, individual and corporations interests and conservationists who wanted to sustain the forested areas. Forests conflicts however, were majorly caused by lose of livelihoods, lack of access to forested areas by the local communities, lack of awareness and poor decision making on the part of government officials. Robert D. Kaplan in his article *The Coming Anarchy*²⁵ argues that environment is a key factor making many countries ungovernable. Kaplan points out that the overuse of natural resources such as clean drinking water will cause future conflicts. He quotes Homer-Dixon²⁶ and asserts that future wars and violence

22 Gerber, Julien.F.(2011) "*Conflicts Over Industrial Tree Plantations In The South: Who, How And Why?*". Global Environmental Change. Retrieved on 17 Aug. 2016.

23 Redpath, Steve et al.(2013) "*Understanding and Managing Conservation Conflicts*". *Research Gate*. Retrieved on 20 Aug. 2016.

24 Wilson, E. (2016) "*Company-Led Approaches To Conflict Resolution in the Forest Sector*". Retrieved on 17 Aug. 2016 from, <http://pubs.iied.org/pdfs/G02510.pdf>.

25 Kaplan, R. (1994, February 1). *The Coming Anarchy*. Retrieved July 12, 2016.

26 Homer-Dixon, T. (n.d.). *On the Threshold: Environmental Changes as Causes of Acute Conflict*. *International Security*, 76-76.

will often arise from scarcities of resources such as water, cropland, forests, and fish. The horn of Africa is currently under immense pressure caused by depleted water resources, diminishing arable land and erratic weather patterns²⁷.

The horn of Africa also suffers immensely from poverty and a high degree of illiteracy. Graham Brown and Frances Stewart says that environmental scarcity theory in its various forms overlaps in a big way with the other hypotheses like social contract hypothesis which views poverty as the main cause of conflict but points out that there are environmental causes that lead to such poverty²⁸. They also point out that the group motivation theory argues that environmental pressures may lead to conflict when a group that has a strong collective authority challenges the authority. They also support their argument using Robert Kaplans article, the coming anarchy where Kaplan predicts a coming anarchy, which to him environmental degradation was going to lead to high levels of criminality and lawlessness as he saw at the time in West Africa²⁹.

In as much as environmental scarcity, theory may hold water there are scholars who argue otherwise. James Fairhead is of the opinion that conflict is not as a result of scarcity of resources but on the contrary, it is as a result of the abundance of resources. He gives an example of the Democratic republic of Congo, a country that has a large deposit of natural resources but has faced a lot of conflict since it attained independence³⁰.

The conflicts in the horn of Africa have also received financing from the sale of natural resources. In some parts, conflicts erupt because of competition for the control of available resources. Philippe Le Billon determines that natural resources has played a conspicuous role in most conflicts³¹. He further argues that at the end of the cold war belligerents who were used to international aid, became dependent on natural resources to sustain their armed forces and military activities, thus bring a new meaning to the economy of war. He continues to say that beyond increasing risks for armed conflict, natural resources were weakening institutional capacity of states to solve conflicts. It is difficult to determine the key factors that cause conflicts because conflict is more complex than thought. Usually, the conflict

²⁷ Kaplan, R. (1994, February 1). The Coming Anarchy. Retrieved July 12, 2016.

²⁸ Brown, G. Stewart, F. (2015). Economic and Political Causes of Conflict: An Overview and Some Policy Implications. Retrieved January 13, 2016, from <http://www3.qeh.ox.ac.uk/pdf/crisewps/workingpaper81.pdf>

²⁹ ibid

³⁰ Fairhead, J., (n.d) "The Conflict over Natural and Environmental Resources," in War, Hunger and Displacement:

³¹ Billon, P. L. (2001). The political ecology of war: Natural resources and armed conflicts. *Political Geography*, 20(5), 561-584. doi:10.1016/s0962-6298(01)00015-4

occurs in different degrees and extents. Besides, the actors involved in conflicts are often complicit with actors such as government, organizations, enterprises, and local communities. These causes come from illegal forest processes, unequal distribution of resources and imbalance of interests and access to the natural resources³².

Consequently, conflicts in the horn of Africa vary from one place to another. In the community level, the severity of Conflict over the use of natural resources occurs in different forms. The factors that cause the conflicts are also different from place to place and they manifest in different forms from quit conflict to open confrontational conflicts.³³ Many researchers who have researched on this field have stated that incompatible policies in resource management and imbalanced power are the main factors that fuel environmental conflict. Phuong Thi Nguyen wrote a paper that looked at the causes of forest conflict, where he points out that weak governance is a recipe for conflict. According to him, governance is linked to poor distribution of natural resources and poor land tenure policies³⁴.

1.4.2 Environmental diplomacy as a means of mitigating conflict

In 1992, a United Nations (UN) conference was held in Rio de Janeiro. The theme of the conference was environment and development. The conference recorded a representation of 180 nations 118 of whom were heads of state. This conference redefined the art of diplomacy and made it more multifaceted, while experts were also given a chance to manage and protect the environment. It was after this conference that protection of the environment became a global responsibility as well as a total change in international diplomacy. In the horn of Africa, environmental issues have generated a lot of interest especially from the international community. In this part of the world land degradation and political dynamics are intertwined to an extent that one cannot be stable without the other. This has led to massive destruction of the environment due to politicians going for their own interests instead of trying to achieve a global good. Scarcity of natural resources has also led to escalation of conflicts within the region. Experts also predict an increase in these conflicts with the emergence of global

³² Patel, P. (n.d.). Causes of conflict. Retrieved August 15, 2016, from <http://www.mheducation.co.uk/openup/chapters/9780335243792.pdf>

³³ Thi Nguyen, P. (2012). Retrieved from <http://ntnu.diva-portal.org/smash/get/diva2:617782/FULLTEXT01.pdf>

³⁴ ibid

warming which is a recipe of erratic weather patterns. This also is a predicate to extreme poverty due food insecurity and loss of livelihoods³⁵.

Kenya has not been left behind by the new developments in international diplomacy. It has engaged in both bilateral and multilateral agreements on environmental management. It is one of the countries that has combined strategies in both conflict management and economic diplomacy especially within the east African region and the Horn of Africa at large. Diplomacy has also been seen a Kenya's foreign policy tool in many aspects with environment always at the top. Kenya has acted as a mediator in many conflicts within the region that have succeeded due the diplomatic solutions used to resolve them. Kenya has also been very active in global and regional trade agreements, which makes it possible for it to enter into agreements on matters pertaining to the environment as well. The environment diplomacy and Kenya's foreign policy are therefore intertwined. Kenya has embraced the use of both track one (official) and track two (non-official) diplomacy. This blend of the two models of diplomacy has made it easy to bring on board non-governmental organization in conflict management³⁶.

1.4.3 Conflict mitigation measures

Researchers who have researched on alternative dispute resolution mechanisms appreciate the fact that African cultures had a way of dealing with disputes even before the arrival of the colonial masters³⁷. When the colonialists came, they took these mechanisms away and replaced them with their own. Yurdi Yasmi also corroborated these findings in his research, *Understanding conflict in the co-management of forests: The case of Bulungan Research Forest*. The research pointed out that the cause of conflicts in Indonesia were mainly because of the inability of the local population to access the forest resources due to hindrances by the mining companies. The failure of the local to be compensated for the pollution of their habitat has been the key reason for the conflicts³⁸.

³⁵ Njuguna, P. Odoyo. M. (2016). *Environmental diplomacy and human security*. Retrieved 15 September 2016, from <https://www.issafrica.org/uploads/EnvironDiplomacyOct08.pdf>

³⁶ *ibid*

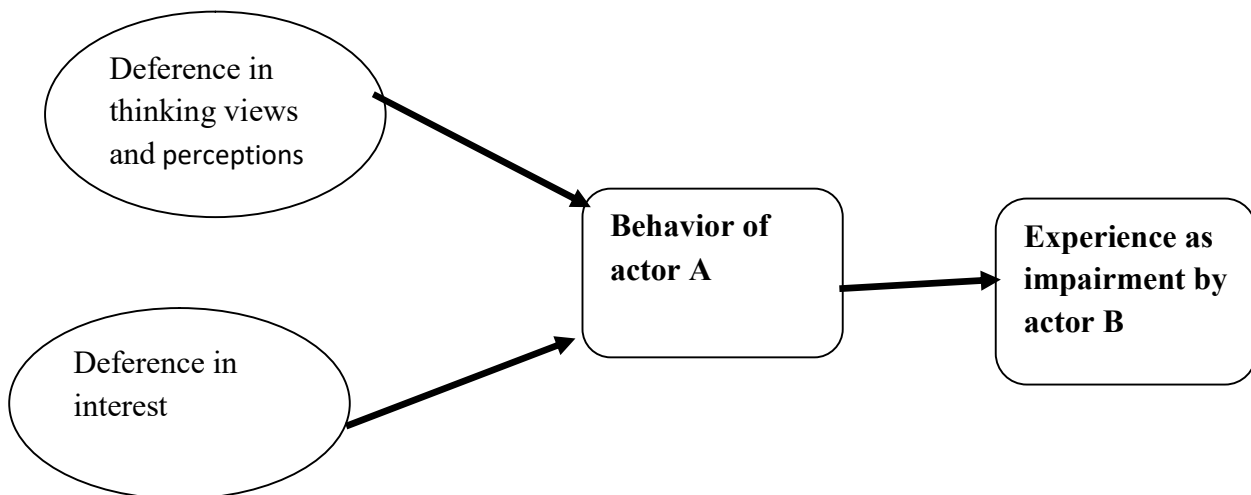
³⁷ Muigua, K., *Resolving Conflicts through Mediation in Kenya*. (Glenwood Publishers Ltd, Nairobi, 2012), Chap.2, pp. 20-37, p.21.

³⁸ Yasmi, Y.(2006) "Understanding Conflict in the Co-Management Of Forests: The Case Of Bulungan Research Forest". *Research Gate*.

The research also found out that different stakeholders, each with its own interests, manage most natural resources. Most government agencies have not been cooperating with the local community in managing the forests. The author points out that the Indonesian government uses forest resources without consulting the local community. As the forest inhabitants fight to sustain their livelihood the government is developing stringent measures to ensure that forests are protected. This has led to massive transfer of forest inhabitants by the government with an intention of conserving the forests. Every conservation effort means an eviction of forest inhabitants and thus an eruption of conflict in the affected areas³⁹.

According to Friedrich Glasl disruption of stakes and interests are is not the only factors that escalates conflict in forested areas but that when the resources to be shared are limited, emotions and perceptions differ between the inhabitants. He says that conflict will only occur if a forest dependent community or organization causes damage to the benefits arising from the forest. Differences in perceptions and interests among actors tend to lead to conflict because a difference in the two means that one of the actors' interests will be impaired. The diagram below illustrates how this can happen⁴⁰.

Figure 2-1: Glasl's model of conflict



Source (Glasl 1999)

³⁹ ibid

⁴⁰ Schlager, E.Elinor. O.(1992) "*Property-Rights Regimes and Natural Resources: A Conceptual Analysis*". Land Economics Retrieved on 20 Aug. 2016.

Consequently, natural resource conflicts occur when two or more actors within the forest ecosystem compete for the same resource. The competition leads to disputes and disagreements mainly caused by lack of access, control and use of the resources⁴¹. Moreover, Jesse C. Ribot reiterates that property relations greatly influence the access and control of resources. To him property and access practices are conflictive in nature because to him, property is what you have an enforceable claim on while access refers to the ability to benefit from things⁴². Schlager and Ostrom on the other hand are of the opinion that property rights are complex due to the fact that it involves bundles of rights, which include user rights, rights to transfer, rights to manage and rights to sell⁴³.

In relation to the study context, conflicts may not be only delimited to rights to the forests but also the questions of benefits resultant from the forest resources and conflicting concepts of the forests. The actors involved in the conflicts can be multi stakeholder such as local families, forest enterprises, and establishments. In addition, the levels of conflict can range under both nonviolent and protest forms. However, the key actors in this study are mainly demonstrated in connection to local communities and forest corporations.

1.5 Research Gaps

In recent years, there has been a lot of research about conflicts in the Mau. Many researchers have attributed the conflicts to politics while forgetting that there are other underlying factors that have never been addressed. Prior studies like blaming the environment; ethnic violence and the political economy of displacement in Kenya by P.Kagwanja in 2002⁴⁴, disassociates the environment and the ethnic conflicts in the Rift Valley. However, Jacqueline Klopp and Prisca Kamungi in their paper Violence and Elections: Will Kenya Collapse? Gives a contrary opinion⁴⁵. They are of the opinion that historical misallocation of property especially land through the executive branch has made the land issue a focus of presidential campaigns and thus end up degenerating into conflict during elections. This research is therefore meant

⁴¹ Mola-Y. David G.(2010) "Determining Forest Conflict Hotspots According To Academic and Environmental Groups". *Research Gate*. Retrieved on 20 Aug. 2016.

⁴² Ribot, Jesse C. Nancy L. Peluso.(2009) "*A Theory of Access**". *Rural Sociology*. Retrieved on 20 Aug. 2016.

⁴³ Schlager, Elinor. O.(1992) "*Property-Rights Regimes and Natural Resources: A Conceptual Analysis*". *Land Economics* Retrieved on 20 Aug. 2016.

⁴⁴ Kagwanja, P. (2002). *Blaming the environment: Ethnic violence and the political economy of displacement in Kenya*. Eldoret, Kenya: Moi University, Centre for Refugee Studies.

⁴⁵ Klopp, J., & Kamunge, P. (n.d.). Violence and Elections: Will Kenya Collapse. Retrieved January 7, 2016, from http://www.academia.edu/7263178/Violence_and_Elections_Will_Kenya_Collapse

to establish the role of environment in this conflict and especially how scarcity of natural resources plays a key role in conflict eruption.

1.6 Justification of the Study

The Horn of Africa and the Mau forest complex in particular were selected for this study because it has been subjected to recurrent environmental related conflicts. This is an area where the population is growing at a very high rate while the natural resources are also diminishing at an even higher rate. This is in combination with other factors such as poverty and high illiteracy levels. It is important to various stakeholders who in different ways, partake in defining the coexistence within the area of study.

This study will help technocrats in government understand the importance of the forested areas and thus put enough funds into protection and rehabilitation of destroyed forested areas. It is also meant to inform on the best ways to prevent eruption of environmental related conflicts and also ways of resolving conflicts that have already erupted. The study is important to a range of policy makers that deal with the environment itself, those that deal with environmental related conflicts and resource allocation in government. This research is meant to shed light on the causes of environmental related conflicts and ways of resolving them through improvement of their policies.

The study will provide material that can be utilized by other researchers who will be researching on the same theme or any other that may be related. It will also shed light on other areas that need further research on matters that pertain to environmental conflict. The findings of this research will be used by fellow academicians to compare findings by other researchers on the field of environmental related conflicts.

1.7 Hypotheses

This study shall test the following hypothesis:

- i. Natural resource scarcity is the main cause of conflict in the horn of Africa
- ii. Environmental diplomacy has played a major role in resolving environmental related conflicts in the horn of Africa.
- iii. Natural resource scarcity in combination with other factors lead to conflict

1.8 Scope and Limitation of the Study

This research focused on those who have encroached the Mau forest, the surrounding communities, political leaders and environmentalists who work within the Mau complex. The findings of this research may not fully bring out the full picture because of:-dishonesty may have existed because all measures are self-report and pressure may have existed for the people to respond in a certain way; the sample may not be a representative of the whole population. The outcome of this research may be replicated in other forested areas where conflicts have been experienced.

1.9 Theoretical Framework

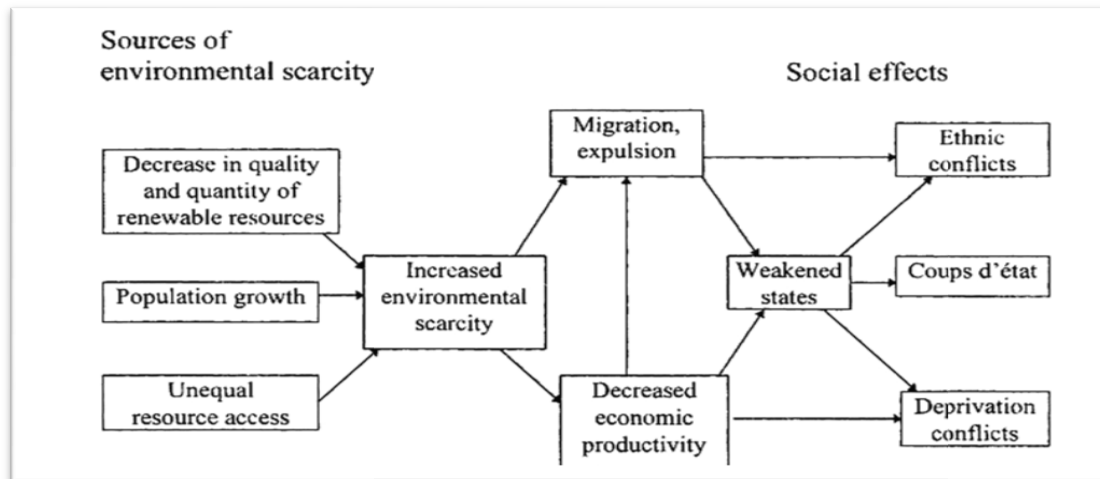
This research is founded on two theoretical models; environmental scarcity model and the environmental diplomacy model. The environmental scarcity model is aligned to Homer-Dixon's Environmental Scarcity and Violent Conflict framework, where he argues that there is a relationship between renewable resource scarcity and outbreaks of conflict. To support this argument, he uses the conflicts that have occurred in El Salvador, Haiti, Peru, the Philippines, and the West Bank.

He reiterates that these scarcities only contribute to conflict under certain conditions⁴⁶. He continues to say that environmental scarcity occurs in three ways, population within a region causing Demand-induced scarcity, degradation of resources causing supply-induced scarcity and unequal distribution of resources causing structural scarcity. According to him, the three are mutually exclusive and often occur simultaneously.

In the figure below Homer Dixon outlines, the sources of environmental scarcity and the effects it has on the state.

⁴⁶ Homer-Dixon, T. F. (1999). *Environment, scarcity, and violence*. Princeton, NJ: Princeton University Press.

Fig.2.2 Sources of environmental scarcity



Source (Homer-Dixon 1994).

The environmental diplomacy model started gaining momentum in the 1980's. In the years that followed this model gained prominence due to adverse environmental problems that befell the world. These environmental problems became more adverse with time and thus was seen by many as a calamity in the making. With the cold war coming to an end, environmental matters took center stage. Environmental diplomacy is now an important topic of discussion in both the political arena and the field of academia. As much as this policy is in existence, the USA has been accused of being amongst the largest contributors to environmental pollution. In this regard, the developing countries are on the receiving end as they are the most affected by environmental problems resulting from pollution from the developed countries. Researchers have pointed out that poverty and natural disasters combined with environmental problems lead to political instability. The aspect of a shared environment has therefore developed this model in a big way. Both developed countries and the developing ones are now coming together to chat the way forward in created a habitable world for all. This concept is not aggressive or against any country and thus is termed as being diplomatic. The presence of emerging economies like china in this arena has made it better because bulldozing by states like the USA is minimized⁴⁷.

⁴⁷ Li. N. (2016). *Concepts Analysis: environmental security and environmental Diplomacy*. Retrieved 13 September 2016, from http://www.biotechnology.uni-koeln.de/inco2-dev/common/contribs/05_nali.pdf

States have therefore agreed to work together by signing and ratifying conventions and protocols. Examples of protocols include; 1st nitrogen in 1988, Montreal in 1987 and Kyoto in 1997. Conventions include; Framework Convention on Climate Change of 1992, Convention for International Trade in Endangered Species (CITES) of 1973 and Vienna Convention for the Protection of the Ozone Layer of 1985, just to mention a few. The Horn of Africa has been affected in a big way by climate change emanating from human activities such as pollution and deforestation. Transboundary conflicts are common especially amongst the pastoralist communities who migrate in search of water and pasture. In the Mau Forest complex, there is a big dispute between the Kipsigis who practice agriculture and the Maasai who are pastoralists. Conflict of interests between the two communities has many at times degenerated into violent conflict. The need to use diplomacy as a means of attaining peace is therefore very necessary in this context⁴⁸.

1.10 RESEARCH DESIGN AND METHODOLOGY

1.10.1 Selection of a methodological approach

Kitchin and Tate look at human geography's methodological approach as a process of understanding the relationship between humans and their surroundings.⁴⁹ Moreover, method is also a tool to simplify an issue in question. Therefore, choice of methodological approach is highly dependent on the aims of the study. Qualitative method is an approach that is useful in social science research because it emphasizes interaction and understanding through audiovisual means⁵⁰.

1.10.2 Study population and sampling method

The research targeted a sample population of 30 interviewees including forest management agencies, forest enterprises, and households in study area. For forest management agencies, including authorities (e.g. communal and district levels) and sub forest protection department

⁴⁸ Ibid

⁴⁹ Kitchin, R.Nick T.(nd) *Conducting Research in Human Geography: Theory, Methodology and Practice*. 1st Edition ed. London & New York: Routledge

⁵⁰ Nichols, B. (1991). *Representing reality: Issues and concepts in documentary*. Bloomington: Indiana University Press.

(sub-FPD), this study chooses 10 respondents from each sector. This research will be carried out in the seven blocs dividing the forest which comprise South-West Mau (Tinet), East Mau, Ol'donyo Purro, Transmara, Maasai Mau, Western Mau and Southern Mau. They are shown in the below table.

Table 1.1 Population of the Study

Region	Forest Manager	Forest Companies	Household
South-west Mau	3	1	10
East Mau	3	1	15
Ol'donyo Purro	2	1	10
Transmara	1	1	13
Maasai Mau	1	1	12
Western Mau	2	1	20
Southern Mau	1	1	12

Source: (Author) 2016

1.10.3 Methods of Data Collection

This study uses both quantitative and Qualitative analysis method to assess and explain research objectives as it exposes the images. With pictures, issues pertaining to the research are understood in a single glance. In this study, issues to do with livelihoods, life experiences, and correlation with what is happening on the ground. In addition, pictures have also brought conviction and validity for a study. Therefore, the main methodology for this research was qualitative. Besides, semi-structured interviews and observations of participants this methodology was used to find out the causes of conflicts over forests in the study area.

1.10.4 Case study approach

Case study can be defined concisely as an intensive study of a single unit in chain of massive understandings. Case study research involves the study of a single instance in order to explore in-depth nuances of the phenomenon, contextual influences and explanations of that phenomenon. Further, the case study provides detailed analysis of theoretical concept or explains the context of the case. Choosing a case study is important because it give an overall picture of patterns for a region or a country. Moreover, case study will reflect the reality of researched objectives⁵¹.

In relation to case of study, in recent years, logging and forest transportation, “usually illegal”, are ongoing in the Mau forest. In addition, these “illegalities” are a genesis of misunderstandings among stakeholders, being cause of conflict between forest stakeholders. Moreover, unfair distribution of benefits resultant from natural resources gives rise to a serious tension in a region. Therefore, approaching cases of study will help to resolve the assumption related to studied purposes. In addition, it brings the researcher’s own understanding into the light as well as provides a new viewpoint from where to analyze the phenomena.

Therefore, choosing out a representative circumstance of the horn of Africa to conduct research is needed initially. Establishment of a study in Kenya Mau Forest will work as representative of Africa and finding the context of forest conflict in Mau forest can be seen as a specific case regarding to forest rich province in Africa.

1.10.5 Validity and Reliability

Kitchin and Tate stated that all good studies aim to be valid and reliable. It should be noted that qualitative or quantitative research handles issues of validity and reliability differently⁵². If qualitative research is as the case of the study, reliability is as the degree for finding dependence of accidental circumstances in the research. Finding validity of data will help to examine degree of correct interpretation for research objectives. To ensure validity and

⁵¹ Hay Group Case Study 2010 - NAB. (2016). Scribd. Retrieved 20 August 2016, from <https://www.scribd.com/doc/136027995/Hay-Group-Case-Study-2010-NAB>

⁵² Kitchin, R. Nick T.(nd). *Conducting Research in Human Geography: Theory, Methodology and Practice*. 1st Edition ed. London & New York: Routledge

reliability, the purpose of the study will be explained to interviewees in order to avoid any misunderstandings and interviewees will be assured of confidentiality. Moreover, friendly, closely, sensitive, and intelligent communications promote relationships during interview over the long time in conducted research. That is also increasing its validity and reliability of the study.

1.11 Chapter Outline

This research represents a study into environmental resource scarcity as a source of conflict. Chapter one introduces the study by giving a brief background and the statement of the problem. This is followed by a comprehensive literature review that is founded on the research objectives. Chapter two analyses environmental resource scarcity as a source of conflict in the horn of Africa while chapter three looks at the natural resources and conflict management in the Mau complex. Chapter four is a critical analysis on the three hypotheses. Chapter five concludes and gives the recommendations.

CHAPTER TWO

ENVIRONMENTAL RESOURCE SCARCITY AND CONFLICTS IN THE HORN OF AFRICA

2.0 Introduction

This chapter analyses the relationship between scarce resources and conflict in the horn of Africa. The analysis is anchored on Homer Dixon's prediction on the extreme increase in population and the effects that come with it. The chapter starts by giving out a synopsis of the resource scarcity conflicts in the horn of Africa. The second part looks at environmental conflict and scarcity followed by environmental changes and land cover degradation.

2.1 Resource scarcity related conflicts in the horn of Africa

The horn of Africa has been affected by environmental related conflicts for quite a while now. In Somalia, inter clan wars have been experienced since the downfall of President Siad Bare's government in 1991. The international community has used a lot of resources to resolve the conflict but competition for resources and clan interests has always derailed the process. Border conflict in the region is a common occurrence. Ethiopia has fought border wars with both Somalia and Eritrea. Eritrea and Djibouti have also had border issues in 2008 that ended up becoming a full blown war. Kenya has also had border issues that are related to resources. The Kenya-Somalia dispute over the Indian Ocean boundary is currently before the international court of justice. The dispute emanates from the gas and oil resources found within the disputes area. Kenya has also had disputes with Uganda over Migingo Island, an area that is very rich in fish⁵³.

In Somalia radical Islamists have taken over in many areas that acacia trees are available for charcoal burning. This was a multimillion business until the UN banned the sale of charcoal from Somalia. The decision was reached after a research carried out by the UN indicated that the sale of charcoal was funding Islamic fundamentalists⁵⁴.

⁵³ Axel B. Harald. S. (2016). Regional Conflicts and International Engagement on the Horn of Africa Retrieved 20 September 2016, from http://www.voltairenet.org/IMG/pdf/Regional_Conflicts_on_the_Horn_of_Africa.pdf

⁵⁴ SC/12248 (2016) Security Council Considers Illicit Charcoal Trade in Somalia, Tensions over Mineral Resources, Eritrea Actions on Issue of Djibouti War Prisoners | Meetings Coverage and Press Releases. (2016). Un.org. Retrieved 20 September 2016, from <http://www.un.org/press/en/2016/sc12248.doc.htm>

Sudan and South Sudan have had the longest conflict in the Horn of Africa that culminated in the separation of the two countries. At the moment the two states have a border dispute over the Abyei region. The border in dispute is rich in oil and thus both states are fighting for a share of the oil. The Sudan has also been affected by conflict in Darfur, a region to the east of the country. This conflict is perceived to be between the power wielders and the poor. The conflict led to the issuance of an arrest warrant against president Bashir by the international criminal court on 4th March 2009⁵⁵. Ethiopia has also face internal disputes in the Gambella region on the border with Sudan. The conflict is as result of competition for scarce resources between Sudanese refugees and the local population. The local's conflict is between the Anuaks and communities from the Ethiopian highlands. The Horn of Africa brings out the dynamics of environmental conflict and how complex it can be to deal with them⁵⁶.

2.2 Environmental conflict and scarcity

The horn of Africa is increasingly under pressure to feed an ever-growing population. As the population increase, arable land is diminishing at a very high rate. This is because families are increasingly in need of agricultural land. This has led to more deforestation as communities look for agricultural land. This has caused increased land degradation as forest cover is depleted. The region is also facing increased tensions amongst the pastoral communities who are fighting for limited resources. The region is currently faced with massive migration of populations as a result of conflicts which are environmentally induced. Cross border, conflicts have also been experienced especially on borders shared by pastoralists. Water is the next war front between many states in the region. Ethiopia is in loggerheads with Egypt because of the Nile waters, which Egypt depends on as the only water source to sustain its food production⁵⁷.

Homer Dixon predicts that the world's population will be past the nine billion mark in the next fifty years. With increase in population, he expects the economic growth to quintuple. The population growth may come with negative attributes that will result in scarcity of renewable resources. Agricultural land will diminish and thus forests will be affected as

⁵⁵ Al Bashir Case. (2016). Icc-cpi.int. Retrieved 20 September 2016, from <https://www.icc-cpi.int/darfur/albashir>

⁵⁶ Axel B. Harald. S. (2016). Regional Conflicts and International Engagement on the Horn of Africa Retrieved 20 September 2016, from http://www.voltairenet.org/IMG/pdf/Regional_Conflicts_on_the_Horn_of_Africa.pdf

⁵⁷ Giessen .E. (2016). Horn of Africa Environmental Security Assessment. Retrieved 15 September 2016, from http://www.envirosecurity.org/espa/PDF/ESA_HOA.pdf

farmers look for arable land. This will be followed by decrease in clean drinking water resources, decline in fish resources and extreme climatic changes⁵⁸.

A conflict that occurs because of competition between different actors for a scarce natural resource may be categorized as an environmental conflict. A good example of such a conflict is when there is a struggle over land resources. This may be because of various reasons such as climate change causing unpredictable rain patterns, soil erosion causing soil infertility, which then result in poor yields. Therefore, the main cause of environmental conflicts is the scarcity of renewable resources. This scarcity occurs because of rapid population growth, unprecedented environmental changes and poor distribution of resources. These three encompasses environmental scarcity⁵⁹. According to Homer Dixon, many analysts have been characterizing environmental problems as resource scarcity. He divides resources into two: renewable and non-renewable. He lists oil and iron ore as nonrenewable while fresh water, forest and fertile soil as examples of renewable resources. Environmental changes occur when human activities induces the drop in the quality and quantity of renewable resources for example fresh water. The negative change overtakes the ability to reproduce the resource⁶⁰.

Three aspects cause renewable resource scarcity and they are Environmental change, population growth and unequal distribution of resources. Each of these three causes affects resource availability in a unique way. Environmental change occurs when the environment is disturbed by human activity and other ecological factors. Population growth on the other hand reduces the amount of available resources and thus creating a competition for the available resources. As the competition for scarce resources increases, survival becomes a priority for all. This therefore introduces the aspect of unequal distribution of resources. This is an occurrence where resources are concentrated on a few individuals who make the resources scarcer. Many researchers who have researched on this field have proofed that environmental scarcities are contributing to violent conflicts in many parts of the world especially sub-Saharan Africa. Homer Dixon looks at these conflicts as a sign of conflicts to come as scarcity of natural resources increases. Conflicts will occur in different levels and societies will be affected differently. Poor societies will get the full brand of the conflict

⁵⁸ Homer. D. (2016). Environmental Scarcities and Violent Conflict: Evidence from Cases, Part 1.

Homerdixon.com. Retrieved 20 August 2016, from <http://www.homerdixon.com/projects/evidence/evid1.htm>

⁵⁹ Homer- Dixon, T, on the threshold: Environmental change as causes of acute conflict, International security, 16, 2, 1991, pp5-40.

⁶⁰ *ibid*

because of their inability cushion themselves from environmental scarcities. Most of these societies are already experiencing extreme scarcities of renewable resources⁶¹.

Homer Dixon is of the opinion that Social conflict is a good thing, because such conflicts sometimes produce opportunities that are of great change in enabling fair distribution of public wealth. On the other hand, environmental conflict may become very destructive when they are complex and unpredictable. This is because they end up overwhelming any social reform. States are sometimes overwhelmed by sharp increase in demand for certain commodities that may be scarce. When this occurs, the state may not be able to sustain the pressure and therefore may disintegrate or become authoritarian. This therefore, makes environmental scarcity one of the most dangerous aspect to human survival.⁶².

Natural variables assume a key part in numerous clashes, yet they are constantly interlinked with Political, financial, and social variables. Diverse sorts of environment-related clashes are affected by specific patterns and call for separated reactions. Three sorts of environment-related clashes can be distinguished: To begin with, the aberrant use, 'resource curse' sort struggle includes the extraction and exchange of important regular resource that are all around scarce, yet locally abundant. Such clashes are frequently connected to exceptionally heightened strife flow. These contentions can be anticipated through measures that endeavor to build great administration in resource rich nations and through worldwide standards that control the universal stream of accounts and merchandise related to regular resources. Secondly, the immediate use, 'neighborhood and local resource shortage' such clashes are largely at a low or medium acceleration level. In the total, notwithstanding, they can be a key element in adverse destabilization forms. Measures to manage such clashes incorporate socially delicate improvement and authorization of property rights; ways to deal with backing participatory resources and peace making; and the advancement of alternatives for economical jobs for the affected populace. Worldwide measures to alleviate environmental change and offer assistance to helpless groups adjust to it constitute further critical lines of preventive activity⁶³.

⁶¹ Homer- Dixon, T, on the threshold: *Environmental change as causes of acute conflict, International security*, 16, 2, 1991, pp5-40.

⁶² *ibid*

⁶³ Mason.S. Muller. A. (2016). *Linking environment and conflict prevention the role of the United Nations* Retrieved 21 August 2016, from <http://www.css.ethz.ch/content/dam/ethz/special-interest/gess/cis/center-for-securities-studies/pdfs/Linking-Environment-Conflict-Prevention.pdf>

The Horn of Africa is faced with many challenges most of which is because of the colonial masters. The colonialists left behind a series of unequal distribution of state resources, resultant poverty and extreme competition for the scarce resources. To date the region is still suffering from poor institutional systems, which is made worse by the different economic models. The region has both agricultural practicing communities and pastoralists. Attacks between the two communities have increased in the recent past because of scarce resources. Governments in the region have difficulties dealing with the resultant conflicts because of poor conflict resolution mechanisms and lack of resources and work force to deal with it. The diminishing resources is pushing more and more people within the region into poverty. All the countries within the region have had inter-tribal conflicts because of disputes over agricultural land, water or pasture⁶⁴.

2.3 Environmental changes and land cover degradation

The use of land in the horn of Africa has transformed land cover depending on the use, ranging from farmlands, grazing zones, settlements zones and urban centers. All these have led to extreme damage to the natural vegetation thus causing deforestation and land degradation. Maitima et al in their research on land use and how it affected biodiversity found out that as native vegetation is lost the biodiversity also changes⁶⁵. This research also found out that livestock keeping conserved the environment as compared to agricultural activities. Farmers practicing both livestock rearing and farming use animal manure to replenish soil nutrients and thus maintain soil fertility. Change in the Environment is never uniform and therefore changes vary from one place to another. The rate of change depends on the interaction between the environment and humans as they go about their day-to-day activities. These abrupt environmental changes led to the need to sustain resources through proper management through timely and accurate monitoring of environmental changes with the aim of understanding the relationships and interactions within a given ecosystem⁶⁶. However, there are great changes because knowledge over time is required to understand the happenings within a given ecosystem. Most countries in the horn of Africa are experiencing

⁶⁴ *ibid*

⁶⁵ Maitima, J. et al. (2009, August 21). The linkages between land use change, land degradation and biodiversity across East Africa. Retrieved August 22, 2016, from [http://www.wec.ufl.edu/faculty/giulianob/private/wis3401/Maitima landuse change and biodiversity.pdf](http://www.wec.ufl.edu/faculty/giulianob/private/wis3401/Maitima%20landuse%20change%20and%20biodiversity.pdf)

⁶⁶ Coppin P., Jonckheere, I., Nackaerts, K., & Muys, B. (2004). *Digital change detection methods in ecosystem monitoring: a review*. International Journal of Remote Sensing

these changes because of the large populations that are looking for agricultural lands and in the process are clearing forested zones to create more land thus causing land cover changes⁶⁷.

2.4. Common property rights in forest management in the horn of Africa

The right to access and use of resources in the Horn of Africa is a major source of environmental related conflicts. Benda-Beckmann argues from the point of law and philosophy and reiterates that property regimes and property rights have always been a common theme for many researchers. On a similar note, other disciplines like social sciences, governance, economics and geography are in agreement with the construct⁶⁸.

More research on the area of common property may be of great help in providing alternative prospects for local forest inhabitants. The local community is the most important when it comes to taking care of the forests and therefore if their common property is managed well, conflict will be at bay. This will also make it easy for the authorities to manage forest resources while maintaining good terms with the neighboring community. The only problem is that there are cost implications because property rights are related to socioeconomic and political circumstances⁶⁹.

Ostrom emphasizes that common property resource is a vague representation and that resources are either controlled as common property or state property or even private property. However, Bina Agrawal argues that land tenure right can only be divided into three, government, private and common. Even though these categories are well defined, there is inadequate distribution of ownership among different actors. She gives an example of forests being the property of the state and not the local population. Her research found out that 80% of the forest is under government control, 12% is under private tenure and a mere 8% is under the indigenous community⁷⁰.

⁶⁷ Pellikka, etal (2004). *Land Use change monitoring applying Geographic Information Systems in the Taita Hills, SE-Kenya*. In: Proceeding of the 5th African Association of Remote Sensing of Environment Conference, Nairobi

⁶⁸ Ibrahim. F., Abdirashid H. Jeremy. L. (2016). *Deegaan*, politics and war in Somalia *Somali-jna.org*. Retrieved 25 September 2016, from <http://www.somali-jna.org/downloads/Ecological%20Sources%20of%20Conflict.doc>

⁶⁹ Schlager. E. Elinor. O. (1992). "Property-Rights Regimes and Natural Resources: A Conceptual Analysis". *Land Economics*.

⁷⁰ Agarwal. B. & Panda. P. (2007). *Toward Freedom from Domestic Violence: The Neglected Obvious*. *Journal of Human Development*. Retrieved on 15 September 2016 from <http://dx.doi.org/10.1080/14649880701462171>

Nguyen Quang Tan did a research and found out that Vietnam by 2005 had 72.4% of the forested areas under government control while 4.4% was under the local communities. The forested area was then divided between the government and private actors. The government controlled 54.6% while the private actors controlled 42.9%. Only 4.9% was under the control of the community. 76.5% of the natural forest is also under state control. 54.6% and 42.9% of the forested land are under state and private corporations respectively. Consequently, in natural forests, community ownerships constituted 4.9% of the total ownerships of national natural forest areas. Meanwhile, 76.5% of natural forest is possessed by the state⁷¹.

On the one hand, Hardin looks at common property management from a different perspective. This is well captured in his article the tragedy of common where he explains the overexploitation of common property resources. He use pastures to explain this point by saying that in the 20th century were an open access property and therefore herders were free to graze their livestock anywhere. He admits that dependence on a natural as a common property without restrictions leads to overexploitation of the resource through overgrazing⁷².

Elinor Ostrom On the other hand looks at Common-pool resources (CPRs) as natural or man-made resources adequate enough so that it is expensive to exclude individuals from attaining subtractable resource-units. Involvement of native communities in the management of environmental resources is also a challenge. Ostrom is of the opinion that those individuals who live near the resource are better placed to manage the resource very well as compared to outsiders. This is because they are operating within their home area and therefore the finding is in line with other research on benefits of common management. However, Ostrom reiterates that this can only be consistent in a small-scale common pool⁷³.

Similarly, Tagseth argues that if a community is able to lay claim of a resource then they can exclude others from any rights or obligations, and access to a resource, which may include water. According to him, community management ensures improved livelihoods and thus conflicts are avoided. This has therefore created a trend globally where the local communities

71 Nguyen. Q. Tan, C. (2016). *Forest Tenure Reform in Viet Nam: Case Studies from the Northern Upland and Central Highlands Regions*. Citeseerx.ist.psu.edu. Retrieved 20 August 2016, from <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.550.2828>.

72 Hardin.G 2016). *The Tragedy of commons*. Retrieved 20 August 2016, from http://www.geo.mtu.edu/~asmayer/rural_sustain/governance/Hardin%201968.pdf

73 OSTROM.E. (2016). Retrieved 20 August 2016, from <http://www.iwpri.ir/images/docs/files/000000/nf00000051-1.pdf>

are given priority in the access and control of forest resources. This is the new era in forest management especially in developing countries where local communities are allowed to exploit their right on forest resources. This is a major problem in the Horn of Africa because some communities are stronger and thus use their might to force weaker communities out of their territories⁷⁴.

2.5 Management of Natural resource conflict

Managing natural resource conflicts the world over is becoming harder because of the dynamics involved. There is massive increase in the demand for natural resources caused by increased human population. On the other hand, climate change is also making natural resources scarcer while soil degradation is not making things any better. The combination of these aspects has increased pressure on the scarce resources thus making communities fight for their share. It is therefore expected that natural resources will continue being a source of conflicts with potentially detrimental consequences to the whole world⁷⁵.

The United Nations as an agency aspires to make the world a peaceful place for all humankind. It is this mandate that the member states see it necessary to assist countries affected by natural resource related conflicts to address conflict risks as well as the peacebuilding opportunities that are available to help in resolving their conflicts. As much as the UN is trying its best, it is faced with challenges emanating from its capacity to coordinate peace building activities, human rights, development projects and humanitarian activities⁷⁶.

In 2005, the UN created the peacebuilding architecture that was meant to address these challenges by responding more effectively to emergence of conflicts and to develop a long-term strategy to effectively consolidate peace across the globe. However, as much as the plan was great, the UN lacked proper understanding on the role played by the environment within the precincts of peace and security. Consequently, it was necessary to look into the peace building strategies available to deal with natural resource based conflicts in a coherent manner. Environmental changes in the recent past have increased the rate of desertification and resource depletion coupled with pressures emanating from the ever-growing human

⁷⁴ Tagseth. M. (2016). Retrieved 20 August 2016, from <http://www.diva-portal.org/smash/get/diva2:355649/fulltext02.pdf>

⁷⁵ USIP. (2007) Addressing the Role of Natural Resources in Conflict and Peacebuilding. Retrieved on 24 August 2016, from <http://www.usip.org/sites/default/files/file/08sg.pdf>

⁷⁶ *ibid*

population. This in turn has led to increased conflicts as populations fight for the scarce resources. The United Nations has not been addressing these issues early enough thus giving conflict a chance to move to higher levels. States on the other hand have always made a wrong analysis about the emergence of conflicts. Many at times small conflicts, which are not solved early enough, run out of hand and end up becoming a threat to national security⁷⁷.

The management of natural resource based conflicts is a very important tool for solving conflicts during the 21st century if the world is to ensure sustainable development. Conservation of the environment enables it to sustain the wellbeing of the flora and fauna. Many at times, conflicts that erupt do so due to community's disagreements over the management and control of natural resources. Lack of early management of these conflicts lead to massive environmental damage that will haunt the current generation and the ones to follow. The management of conflicts of this kind should ensure that the positive gains by the populace should outdo the negatives.⁷⁸

The complexness and variability of natural resource based conflicts are so overwhelming, that it needs planned effort to stimulate and promote a good understanding in order to extend our understanding. The existing conflict theories do not take into consideration the dynamic nature of conflict that we face now. Extraction of natural resources has become a conflict trigger that has been fueling conflict in the east African region. Shared natural resources has also led to disputes because of competition for access and control of the resource. Interstate disputes have been witnessed between Kenya and Uganda over the fish around Migingo Island in Lake Victoria. If such a conflict is not resolved, it can spiral out of hand and explode into a full-blown war, which will then hinder development within the region. Natural resource conflicts lead to deterioration in the quality of life, weak socioeconomic and political establishments⁷⁹.

⁷⁷ USIP. (2007) Addressing the Role of Natural Resources in Conflict and Peacebuilding. Retrieved on 24 August 2016, from <http://www.usip.org/sites/default/files/file/08sg.pdf>

⁷⁸ Vinay. s. (2016). *Analyzing conflicts in natural resource management*. vinay sinha - Academia.edu. Retrieved 24 August 2016, from http://www.academia.edu/4309196/analysing_conflicts_in_natural_resource_management

⁷⁹ Robert .H.(2016). *Essays in African land law*. Retrieved 22 September 2016, from http://www.pulp.up.ac.za/pdf/2011_15/2011_15.pdf

2.6 Environmental Conservation and Conflict management

Professor Saleem Ali is of the opinion that humans can create positive gains if they use ecological diplomacy to a peaceful co-existence within their ecosystems. However, in the recent past, debates on the relationship between natural resources and peace have concentrated on the problems climate change and natural resource scarcity are likely to cause. Ecological diplomacy as advanced by Professor Saleem Ali on the other hand pushes for attainment of peace through environmental initiatives.⁸⁰ As the economy grows, additional natural resources are going to be depleted. These natural resources will ultimately reduce or maybe stop all together economic development. Consequently, economic development ought to put into consideration how natural resources are used while at the same time putting in place protection mechanisms to safeguard the environment. A proper analysis of the relationship between economic development and conservation will be helpful in helping us understand this phenomenon. To achieve an equilibrium between these two aspects a compromise must be reached such that growth in development induces minimum damages on the environment⁸¹.

Many governments have created several efforts that are aimed at protecting the environment. These efforts play a significant role in the development of legislation and adoption of policies regarding environmental problems. They are also working hand in hand with the education sector to raise public awareness through education. Governments are also working with the industrial community to come up with measures that will ensure that the environment is safe for human habitation. This has been done by scaling down taxes and offering subsidies with the aim of urging industrialists and entrepreneurs to incorporate environmental protection measures within the investment programs. They should also work together to enact and enforce laws, appreciate rules pertaining to pollution standards, forbidding any attempts to discharge harmful chemicals into the environment, and to work towards improving the state of the environment⁸².

The government is now working with likeminded partners to provide environmental protection services. Governments also work hand in hand with the local communities to regulate use of public lands for agricultural activities, grazing and mining. Investors are asked

⁸⁰ Notaras. M. (2016) *Building Peace through Environmental Conservation - Our World*. Retrieved on 25 August 2016, from <https://ourworld.unu.edu/en/building-peace-through-environmental-conservation>

⁸¹ Conflicts between Economic Development and Conservation. (2016). Ychlpys.edu.hk. Retrieved 25 August 2016, from <http://www.ychlpys.edu.hk/~bio/share/0405/ecologyessay/gordon/11.htm>

⁸² *ibid*

to maintain acceptable pollution levels through bettering their technology. One major obstacle in protecting the environment is ignorance on the part of the general population. This is caused partly by lack of awareness creation. This has therefore forced the government to actively organize training programs that are aimed at increasing the awareness on the importance of the environment. Other than government institutions, other environmentally involved teams are also actively putting in their energies in environmental awareness. A good number of these institutions like the Green belt movement are fully established. They engage in various environmental protection activities, and environmental awareness education⁸³.

Biodiversity in the East African region is well brought out by the environment. It is rich with biological diversity ranging from wildlife to montane forests that play a very important role in the development of the region. This is the reason why most conflicts evolve around forests⁸⁴. Debates have emerged on whether forest conservation by avoiding deforestation may have both positive or negative social impacts whereby there is a possibility of conflicts between the protection of forested zones and ancillary negative effects, where the local community can no longer access the forest resources⁸⁵.

The forested areas are affected by Poor management mechanisms from the government, a situation that is causing a lack of proper sharing formulae amongst the different parties. This causes a shift in the access and control capabilities. This leads to tensions emanating from grievances that may escalate into to armed conflict and even war. Many governments have contributed in one way or another to conflict by limiting access to national forests. Traditional inhabitants therefore end up lacking access to their ancestral homeland. The recent eviction in the Mau Forest is a good example where restriction to the access of a national forest generated major political and social impacts in the country⁸⁶.

⁸³ Conflicts between Economic Development and Conservation. (2016). Ychlpysse.edu.hk. Retrieved 25 August 2016, from <http://www.ychlpysse.edu.hk/~bio/share/0405/ecologyessay/gordon/11.htm>

⁸⁴ Kalande. W.(2008).Kenyan Land Disputes in the Context of Social Conflict Theories. Annual Meeting and Open Symposium on Environment and Land Administration ‘Big Works for Defense of the Territory’ Verona-Italy.

⁸⁵ Heinrich .S.(nd). ‘Roadmap to prosperity through sustainable Natural resources management in the East and Horn of Africa’, Essay of the East and Horn of African Delegates, Retrieved 25 August 2016, from https://www.boell.de/sites/default/files/assets/boell.de/images/download_de/EHOA_HBS_Delegates_essay_fin

⁸⁶ Omondi. Olang.P.Musula. K. (2016).*Land Degradation of the Mau Forest Complex in Eastern Africa: A Review for Management and Restoration Planning*. Retrieved 25 August 2016, from http://www.ku.ac.ke/schools/engineering/images/stories/docs/publications/land_degradation_mau.pdf

The Endorois is a minority community of about 60,000 people living around the shores of Lake Bogoria. In 1973, the government of Kenya gazzetted the Endorois land to create Lake Hannington Game Reserve. In 1978, Lake Bogoria Game Reserve was gazzetted. This led to the Endorois community losing a land they had an attachment to for centuries⁸⁷.

In a case filed on behalf of the Endorois community by the Centre for Minority Rights Development (CEMIRIDE) and Minority Rights Group International (MRG) in conjunction with Centre on Housing Rights and Evictions (COHRE), the Endorois alleged that the government of Kenya violated their rights by displacing them from their ancestral land. They further alleged that the government failed to compensate them for losses incurred, disruption of their pastoral activities and violation to practice their religion and culture⁸⁸.

In its ruling, the African Commission on Human and People's Rights (ACHPR) were of the opinion that the government of Kenya violated the rights to freedom of worship, property ownership, healthcare, cultural practices, and resources as per the African Charter on Human and Peoples' Rights. The court further recommended restitution of Endorois community land, recognition of their rights of ownership to the Endorois land and compensation for the loss suffered. Many have argued that compensation schemes are failing miserably because of the continued dominance of conservation over the livelihood needs of the population. The Convention on Biological Diversity (CBD) is a legally-binding treaty whose goals aims at, conservation of biodiversity and the sustainable use of same; fair and equitable sharing of the benefits arising from the use of natural resources and the encouragement of actions that will lead to sustainable coexistence.⁸⁹

Article 27 of this treaty talks about the settlement of disputes and has a provision, which states that if a dispute between parties occurs concerning the interpretation of the convention, solution be achieved through negotiation or mediation. If it fails then the act allows the parties to submit the dispute to the international court of justice. In as much as article 27 acts as a dispute resolution mechanism, the act lacks the enforcement mechanism or action to be taken against a government, which destroys its own bio-diversity. This then qualifies the

⁸⁷ Rhodri C. W. (2010)*The African Commission "Endorois Case"* – Toward a Global Doctrine of Customary Tenure? Retrieved 22 September 2016, from <https://terra0nullius.wordpress.com>

⁸⁸ Rhodri C. W. (2010)*The African Commission "Endorois Case"* – Toward a Global Doctrine of Customary Tenure? Retrieved 22 September 2016, from <https://terra0nullius.wordpress.com/2010/02/17/the-african-commission-endorois-case-toward-a-global-doctrine-of-customary-tenure/>

⁸⁹ United Nations, Charter of the United Nations, 24 October 1945, 1 UNTS XVI, Available at: Retrieved 25 August 2016, from <http://www.refworld.org/docid/3ae6b3930.html>.

argument that the act is good for interstate dispute resolution but cannot be effective in solving local community disputes⁹⁰.

2.7 Using regional bodies to manage environmental related conflicts in the Horn of Africa

Intergovernmental Authority on Development (IGAD) is the Horn of Africa's regional body that has been faced with the task of resolving conflicts. These conflicts range from border conflicts, Islamic insurgencies and environmental related conflicts like in the Darfur, Sudan. IGAD came into being in 1986 with a mandate to eliminate drought and famine from the horn of Africa. With time the member states saw the need to improve the mandate and make it active in conflict prevention, resolution and management⁹¹. This was made possible in 1996 when IGAD received the mandate, since then it has worked towards making the horn of Africa a peaceful region. IGAD in conjunction with the African Union (AU) are working hard to stabilize Somalia and S. Sudan. Due to inadequate resources IGAD through the AU has been asking for help from the UN. In 1991 there was a change of government in Ethiopia that changed the political atmosphere in the Horn of Africa. The Somali government came down and multiparty democracy kicked in most of the regions states. Due to political tensions within the region, member states decided to expand the mandate of IGAD to include peace and security. A common security strategy to stabilize Somalia and engage the Sudan was agreed on and so far great achievements have been achieved in the two cases. IGAD states also realized the important role played by the environment in conflicts within the region. States have therefore increased their funding towards peace building and conflict management⁹².

2.8 Chapter Summary

This chapter starts by outlining environmental related conflicts in the Horn of Africa and proceeds to analyze the relationship between scarce resources and conflict in the horn of Africa. It goes on to examine the effects of land degradation and how it combines with

⁹⁰ *Convention Text*. (2016). Article 27. Settlement of Disputes Retrieved 22 September 2016, from <https://www.cbd.int/convention/articles/default.shtml?a=cbd-27>

⁹¹ Memar. A. (2016). *Conflict resolution responses of IGAD and au to the Somalia crises*. Retrieved 24 September 2016, from <http://www.academicresearchjournals.org/IJPSD/PDF/2014/November/Memar.pdf>

⁹² *ibid*

scarcity to cause conflict. Property rights and how the horn of Africa is affected when it comes to conflicts pertaining to ownership of land in forested areas is also looked at in detail. The last part looks at how regional bodies like IGAD are resolving conflicts within the region.

CHAPTER THREE:

ENVIRONMENTAL RESOURCES AND CONFLICT MANAGEMENT IN THE MAU COMPLEX

3.0 Introduction

This chapter analyses issues to do with natural resources that affect the Mau forest complex. The issues range from depletion, degradation, conservation strategies and development plans. This is meant to bring out the issues affecting the Mau complex and the steps taken to resolve them. The chapter is anchored on environmental resources theory and the environmental diplomacy theory.

3.1 Resource Depletion and Degradation as a source of conflict in the Mau

The Mau forest is one of the largest closed canopy forest in the horn of Africa. Being one of the five water towers in Kenya and the absolute most essential water catchment in Rift Valley and western Kenya, it is a characteristic resource of national significance. Soil degradation and the ever diminishing agricultural land, forested areas, water and fish will be a noteworthy donor to social conflict sooner than environmental change or exhaustion of the ozone. Experts and strategists in the world have directed their attention to environmental change and ozone exhaustion⁹³.

Researchers have divided land cover changes into two; land cover modification and land cover conversion. Land cover modification is the full substitution of one vegetation cover with another. On the other hand, land cover conversion refers to the gradual land cover change⁹⁴. This gradual change may be because of natural resilience of an ecosystem due to climatic unpredictability. In the MFC, two types of cover change have been experienced. These changes are largely attributed to the high population that is in need of more land for settlement, pasture and agriculture. The economic position of the population is also a

⁹³ Bp, G., Dwarakish, G. (2013). *Different Approaches for Land Use Land Cover Change Detection: A Review*. ResearchGate. Retrieved 22 September 2016, from https://www.researchgate.net/publication/282854976_Different_Approaches_for_Land_Use_Land_Cover_Change_Detection_A_Review

⁹⁴ Foody, G. M. (2001). Monitoring the magnitude of land cover change on the southern limits of the Sahara. *Photogrammetric Engineering and Remote Sensing*. Retrieved 20 August 2016, from http://www.isric.org/isric/webdocs.Docs/ISRIC_Report_2004_01.pdf.

contributing factor because it has forced them to burn charcoal to meet their daily needs. This has heightened the speed of degradation to extreme levels⁹⁵.

Tea farmers in the Mau forest region have felt the full brand of the climate changes caused by destruction of the Mau forest. Similarly, the tea and commercial enterprise industries within the neighborhood have also been hit hard. Production of tea is barely attainable within the neighborhoods of the tropical forest. The crop, that ranks high and is the second highest wage earner of foreign change in Kenya, needs a cool climate, which might solely exist within the proximity of established forests like the Mau⁹⁶.

The tea industry is one of the most hit sectors of the economy by the effects of climatic changes. This is because tea need a wet and cool climate to maximize production and increase the quality of the products. The tea growing areas are warmer and drier because of the destruction of the Mau forest. At the height of destruction the amount of water flowing downstream reduced by a great percentage. This affected other sectors like tourism and energy, which are dependent on water from the Mau tower⁹⁷.

3. 2 Factors encouraging encroachment in the Mau forest

Lack of political will in protecting the Mau forest is encouraging more encroachment. KWS personnel who are protecting the forest have complained about politicians interfering whenever encroachers are arrested. Politicians are also beneficiaries of the forestland and thus are not willing to create strong laws that will lead to their expulsion from the forest⁹⁸. Research has also shown that encroachers form a very big percentage of voters in the region. The population explosion in the region is also another factor that has created a lot of need for agricultural land. The encroachment was also fueled by ranch owners who applied for consent to subdivide the land bordering the Maasai Mau. This gave politicians a loophole to

⁹⁵ Bp, G., Dwarakish, G. (2013). *Different Approaches for Land Use Land Cover Change Detection: A Review*. ResearchGate. Retrieved 22 September 2016, from https://www.researchgate.net/publication/282854976_Different_Approaches_for_Land_Use_Land_Cover_Change_Detection_A_Review

⁹⁶ Agricultures Network. (2016). *Degradation of Mau forests threatens agriculture and Kenya's economy* — Retrieved 21 August 2016, from <http://www.agriculturesnetwork.org/magazines/east-Africa/62-trees-farming/Mau-forest-degradation>

⁹⁷ Kipkoeh.A. etal (2016). Repository.eac.int. Retrieved 22 September 2016, from <http://repository.eac.int/>

⁹⁸ Serah M. (2016) *Encroachment on Mau Forests Complex, Kenya* . Environmental Justice Atlas. Retrieved 20 September 2016, from <https://ejatlas.org/conflict/enchroachment-on-mau-forests-complex-kenya>

expand the boundaries of the ranch into the forested area. The extended parts were then excised without the knowledge of the Narok county council. To make it look genuine, scrupulous executives were used to obtain letters of no objection from the county council. The letters affirmed that the subdivision did not affect the government land⁹⁹.

3.3 Mau Forest conservation strategies

The Mau Forest Complex started facing massive destruction from the local community in the late 1980's. The coming of multi-party democracy made things worse as politicians used the government forestland to compensate their cronies and bribe the voters. By 2005, the world became concerned because the rate of destruction was at a very dangerous level. Environmental activists demanded for action as the international community asked the government to save the Mau. The international community foresaw a regional security threat emanating from the ecological role the Mau was playing. Kenya Forest Service (KFS) was given the mandate by the government to protect all forested areas. This was meant to address issues like degradation and deforestation in all the forests under government control. The Kenya forest act was enacted in 2005 with an aim of grounding KFS in law and giving it enough powers to perform its duties. The act also strengthened participative approach to the management of the forests by all stakeholders¹⁰⁰.

The government also established the Task Force for the Mau Forest Complex (TF-MFC) which was placed under the office of the Prime Minister. The main assignment for the task force was to come up with strategies that were going to be used to restore the Mau forest within the shortest time possible. The TF-MFC came up with intervention, which were divided into three; short term interventions, which were to be achieved within the first three years. Phases 2 and 3 involve medium and long-term interventions, which were aimed at a sustainable level of rehabilitation.¹⁰¹

Many environmental conservation bodies are involved in the process of rehabilitating and conservation of the forest. The major international Programme is under UNEP, which is

⁹⁹ Nkako .M. Christian L. Michael G. (2016). *Maasai Mau Forest Status Report 2005*. Retrieved 20 September 2016, from http://www.iapad.org/wp-content/uploads/2016/01/maasai_mau_report-1.pdf

¹⁰⁰ Interim Coordinating Secretariat (2016). *Brief on the rehabilitation of the mau forests complex*. Retrieved 15 September 2016, from http://thereddesk.org/sites/default/files/mau_forest_complex_progress_sheet_2010.pdf

¹⁰¹ Mau Forest Complex Concept Paper. (2009, September). Retrieved August 23, 2016, from <https://www.scribd.com/document/127151096/Mau-Forest-Complex-Concept-Paper>

assessing threats to critical montane forests within the East African region. The Mau Trust Fund came into being when stakeholders like Kenya Wildlife Service (KWS), East African Breweries Ltd (EABL), Equity Bank, Nation Media Group and the Green Belt Movement, came together with an urge to save the Mau forest. The committed Kshs50 million which enabled the planting of 25,000 trees in the Mau forest¹⁰².

3.4. Development of effective institutional framework and strategic Management Plan

The Task Force for the Mau Forest Complex (TF-MFC) commissioned a study on the legal and institutional arrangements that would be used to manage forests in Kenya. This initiative was supported by the USAID. The task force gave a recommendation to the Kenyan government on the establishment of an interim coordinating secretariat to look into the implementation of the recommendations on conservation and rehabilitation of the destroyed parts of the Mau complex. The task force recommended a formation of the Mau complex authority whose functions were to oversee the management of the Mau complex. The authority under the leadership of a board of directors was comprised of representative from the main sectors, which included the economic sector, which depended on the Mau for its survival¹⁰³. These sectors included agriculture, tourism, forestry and water. The taskforce also recommended that the government needed to implement drastic management changes to move the management responsibilities from the forest department to the Kenya forest service.¹⁰⁴ Consequently, the taskforce thought it necessary to integrate the new strategies with the existing plans from development partners and vision 2030. This was aimed at hastening the implementation through use of available data and the newly acquired¹⁰⁵.

3.4.1 Boundary surveys and issuance of title deeds

Proper demarcation is very important in areas bordering forested zones if encroachment is to be avoided. It is easier to manage and protect the forest when the boundaries are well defined and are known by the community. To ensure that encroachment was stopped, the task force established a joint enforcement unit in 2008 that was composed of KWS, KFS,

¹⁰² ibid

¹⁰³ Interim Coordinating Secretariat (2016). *Brief on the rehabilitation of the mau forests complex*. Retrieved 15 September 2016, from http://theredddesk.org/sites/default/files/mau_forest_complex_progress_sheet_2010.pdf

¹⁰⁴ ibid

¹⁰⁵ ibid

Administration police and the Narok county council. The composition of the joint team gave it access to different resources like helicopters for surveillance, which were provided by KWS. The KFS and administration police officers carried out foot patrols that managed to reduce the rate of encroachment by a very high percentage¹⁰⁶.

3.4.2 Relocation, resettlement of families

The Mau forest has been affected by displacement of populations with an aim of saving the forest since the 1980's. This act has always been followed by widespread protests from both the community and human rights activists. The entry of multiparty politics in 1992 made things worse because politicians are always trying to win votes by protesting on behalf of the populace. During the World Parks Congress in Durban in 2003, there were many protests between human rights activists and the environmental activists against disruptions of conservation to society and livelihoods¹⁰⁷. Concerns have also been rising on possible impacts brought about by the displacements of the populations. Many are proposing voluntary displacement but this does not seem to work in Africa because the communities are poor and depend entirely on land for survival. Relocation involved transferring of the communities living in forested areas and providing them with alternative land in other areas. Most of those relocated were provided with support to prevent movement back to the forested areas¹⁰⁸.

3.4.3 Public awareness and community sensitization

This was a learning process, which was aimed at increasing the communities' knowledge and awareness about the environment while at the same time developing skills to address environmental challenges and change the communities' attitudes towards the environment. This was also meant to make the restoration process easy because the government had an intention of involving the local community. Making the community aware of the benefits and the opportunities thereof was very important in order to avoid individuals sabotaging the

¹⁰⁶ Task force (2016). *Task force on the conservation of the Mau forests*. Retrieved 22 September 2016, from <http://docplayer.net/21358260-Report-of-the-prime-minister-s-task-force-on-the-conservation-of-the-mau-forests-complex.html>

¹⁰⁷ Abel, N. and P. Blaikie. 1986. Elephants, people, parks and development: The case of the Luangwa Valley, Zambia. *Environmental Management* 10:735-751.

¹⁰⁸ Mau Forest Complex Concept Paper. (2009, September). Retrieved August 23, 2016, from <https://www.scribd.com/document/127151096/Mau-Forest-Complex-Concept-Paper>

process. Creating a sustainable livelihood option for the population was also very important because the forest was all they knew. Employment opportunities emanating from the forest was very important for the community because it gave them a sense of belonging and thus were willing to take care of the forest. The Kenya forest service therefore ensured that the community was given a chance to raise most of the required seedlings for the rehabilitation process¹⁰⁹.

3.5 Approaches to the Management of Natural Resource-Based conflicts in the Mau forest

As noted previously in this paper, natural resource conflicts emanate from disputes over access to, and control of resources. The Mau forest complex has inhabitants whose activities differ. There are those who practice agriculture, others are pastoralists while others practice both. This creates a ripe ground for disagreements arising from access and use of the resources. As the resources are depleted, the magnitude of conflict over natural resources also increase. This therefore demand early resolution before they escalate out of control. The resolution mechanism depends largely on the nature of the dispute. It can either take a formal or informal perspective depending on the setting. If it takes a formal perspective, it will involve a judicial process while informal will be non-judicial which includes, diplomatic initiatives, negotiation, conciliation, mediation and the traditional justice systems¹¹⁰.

More importantly, Article 33 of the UN Charter outlines the conflict management mechanisms to include negotiation, enquiry, mediation, conciliation, arbitration, judicial settlement, and use of regional agencies or other peaceful means. This article supports states constitutional frameworks and acts as a point of reference in international conflict resolution. This process is judicial and may not necessarily solve local conflicts and therefore alternative dispute resolution mechanisms take charge. In this case, the local community has a major role to play and therefore is more inclusive and can be owned by the community. In the African context traditional believes can also play a role in conflict resolution. There are believes that

¹⁰⁹ Darina. P., (2016). *Attitudes Towards environmental issues: empirical evidence in europe and the united States*. Retrieved 22 September 2016, from http://www.transworld-fp7.eu/wp-content/uploads/2014/06/TW_WP_31.pdf

¹¹⁰ FAO.(2016). Retrieved 26 August 2016, from <http://www.fao.org/forestry/21572.pdf>

are shared by different communities which are usually invoked for the purpose of restoring peace¹¹¹.

3.5.1 Need for management

Natural Resources Management encompasses the sustainable use of natural resources in order to benefit from them. They provide a balance in the ecosystem services that support human life. It is therefore very necessary for the human race to manage natural resources to alleviate poverty and stop further degradation. Natural resources is one of the most important aspects in human survival. They are a combination of many things that make up our environment which include soil, water, vegetation, animals and other organisms. All these are very important for human being's survival.¹¹² Many African countries have failed to engage all stakeholders in the management of natural resources and this has resulted in conflicts related to the environment. These conflicts have not given the people a chance to exploit the natural resources to its full capacity. This therefore call for proper management of resources if the community wants to benefit from it¹¹³.

3.5.2 Judicial mechanisms

The Kenyan law recognizes adjudication and arbitration as methods of conflict management. The Kenyan law was influenced by the British common law because it was a British colony. The African custom were never considered when coming up with the Kenyan law and thus the recent changes that includes the views of the local communities. The cost of filling a case, complex procedures and an ill-equipped judicial system has also hindered the poor population from getting justice. The inability of the judicial system to blend with the cultural dynamics of the Kenyan people has also made things worse for the poor population. This has also made many to avoid taking their cases through the judicial system¹¹⁴.

¹¹¹ Francis, D. (2006). *Uniting Africa*. Aldershot, England: Ashgate.

¹¹² Managing Natural Resources - Department Of Environment, Water And Natural Resources (DEWNR)". *Environment.sa.gov.au*. N.p., 2016. Web. 26 Aug. 2016.

¹¹³ Population Action International, 'Why Population Matters to Water Resources', available at <http://populationaction.org/wp-content/uploads/2012/04/PAI-1293-WATER-4PG.pdf> [Accessed on 28/08/2016].

¹¹⁴ Mohamud.A.Ruto.k. (2016). *Conflict Management in Kenya: Towards Policy and Strategy Formulation*.

Retrieved 28 August 2016, from https://practicalaction.org/docs/region_east_africa/practical_action_conflict_management.pdf

Other than the cost of filling a case, time is also a factor. Litigation process takes time because it is never about solving a problem but winning an argument. However, this not to say that court processes should be done away with all together, there is an advantage attached to it as well, it is an open and transparent process, its uses uniform compliance with land laws and that once a determination has been reached, its final and binding. Kenya broke ranks with other African countries in 2010 when it enacted a constitution that established specialized courts, which included those that dealt with the environment. The right to live in a clean and healthy environment captured article 43 of the Kenyan constitution, this law enhances the role of the state in achieving sustainable development. The environmental court is also given powers to hear and determine matters pertaining to denial, violation, infringement or threats to rights pertaining to a healthy environment. These powers are contained in articles, 42, 69 and 70 of the Kenyan constitution 2010. The court is also empowered to decide on any other appropriate means of alternative conflict resolution mechanisms, which include conciliation, mediation and traditional methods as agreed with the parties and as per Article 159(2) of the Constitution¹¹⁵.

3.5.3 Alternative Dispute Resolution (ADR) and Informal Methods

(a) Alternative Dispute Resolution Mechanisms Approach

Dispute Resolution (ADR) can be used as a conflict management tool and therefore empower the Kenyan people because it encourages public participation. Kariuki Muigua argues that for the aspirations of the people to be met, there must be a secure and peaceful environment. This environment should give the people a chance to air their grievances and make decisions regarding their own issues and access justice as envisaged in the Kenyan constitution of 2010¹¹⁶.

ADR is a good tool in dealing with environmental conflicts because it allows one to choose a mechanism depending on the dispute at hand. The UN also guarantees the indigenous people their rights through its declaration on the rights of indigenous people. This declaration provides for the right to access prompt decision through just and fair procedures when

¹¹⁵ Kaniaru, D.W. (2012). *Environmental Courts and Tribunals: The Case of Kenya* Retrieved 28/8/2016 from <http://digitalcommons.pace.edu/cgi/viewcontent.cgi?article=1697&context=pehr>

¹¹⁶ Muigua, K. (2015). Home. *Empowering the Kenyan People through Alternative Dispute Resolution Mechanisms*. Retrieved August 28, 2016, from <http://www.ciarb.org/docs/default-source/centenarydocs/speaker-assets/kariuki-muigua.pdf?sfvrsn=0>

managing conflicts. It also provides for effective remedies to conflict pertaining to individuals or collective rights. Decisions emanating from this process should therefore take into consideration the customs, traditions and rules of the legal system pertaining to the indigenous people¹¹⁷. The essence of using ADR is to allow parties in conflict to mutually agree on satisfying outcomes and this can only be achieved through negotiation or mediation¹¹⁸.

(b) Conflict Management through Negotiation

Negotiation can either be direct or indirect mode of communication whereby parties in conflict discuss ways of solving the conflict between them. Negotiations is a good method because it can be used to solve an already existing conflict or prepare groundwork for a future relationship between two parties. As much as negotiation is something that is done by many in their day-to-day activities, it is always unique to any given conflict¹¹⁹.

The good thing about negotiation is that it is voluntary because no party is forced to take part in the negotiation process. Parties are also free to accept or reject any outcome from the process. However, parties can take part directly in the negotiation or be represented by someone whom they have trust in. The other advantage is that negotiation is non-adjudicative, this means that the negotiation process is about the parties in conflict only without interference from external entities. It also creates room for bilateral or multilateral negotiations because negotiations may be between two parties or many different groups. Negotiation is also seen to be confidential because parties have the capacity to decide whether the process should take place in public or in private. Rules are said to be some of the common hindrances to reaching a common understanding, but when it comes to negotiation there are no laid down rules. The parties are free to decide on what they want to be used to guide the process. Flexibility is also a very important aspect that allows parties to reach an amicable solution¹²⁰. Many are of the opinion that negotiation is the best mechanism for conflict resolution because it saves time and reduces the cost. Negotiations pertaining to

¹¹⁷ *ibid*

¹¹⁸ Siegfried W. (2016). Indigenous Sovereignty: A Reassessment in Light of the UN Declaration on the Rights of Indigenous Peoples Retrieved 22 September 2016, from https://wp0.its.vanderbilt.edu/wp-content/uploads/sites/78/Wiessner_final_7.pdf

¹¹⁹ Goldberg.G. Frank.E. Rogers.N.(1992) Dispute Resolution: Negotiation, Mediation, and Other Processes, (2nd ed.)

¹²⁰ *ibid*

environmental conflicts unlike in a political conflict concerns interests and not positions. It is more connected to the communities because it entails a sense of belonging as well as the source of their livelihood. This gives negotiation a chance because each one is assured of winning something out of the process¹²¹.

3.5.4 Traditional Justice Systems

In the African setting Traditional and informal justice systems, have gained a lot of support mainly because the current judicial systems wastes time and resources. This type of conflict resolution mechanism was not given much attention in the past yet recent studies shows how important it is and it's potential in the management of conflict¹²².

The traditional justice system is based on the norms and believes of a certain group of people. They are guided by customs, which are customary and are passed from one generation to another through oral teachings by the older generation. Many at times the parties in conflict are asked to disclose their point of contention after which the council of elders discusses it. In the case of the Mau every village has a chief elder (Boiyop kok), who controls all discussions pertaining to conflicts. This is a concept that has been used by the Kalenjin community for ages. The traditional justice system has both strengths and weaknesses just like any other justice system. Sometimes its overwhelmed because many people tend to avoid the formal justice system due to the cost and time implications. As much as many accept it, the rapid social and economic change in the Horn of Africa is reducing the degree of trust in this system. The other question is whether these traditional methods are in line with the international human rights code of conduct. Consequently, reformers are having a problem as they try to make sure that different mechanisms complement each other instead of conflicting¹²³.

¹²¹ DOJ(2015)Negotiation - Dispute Prevention and Resolution Services. Retrieved 22 September 2016, from <http://www.justice.gc.ca/eng/rp-pr/csj-sjc/dprs-sprd/res/drrg-mrrc/03.html>

¹²² Francis .K. (n.d.). Community, Customary and Traditional Justice Systems in Kenya: Reflecting on and Exploring the Appropriate Terminology. Retrieved August 28, 2016, from <http://www.strathmore.edu/sdrc/uploads/documents/books-and-articles/Paper%20on%20Traditional%20justice%20terminology.pdf>

¹²³ Goa, J. (2013,). Academia.edu - Share research. (*Informal*) *Traditional Justice System* | Joshua Goa - Academia.edu. Retrieved August 28, 2016, from http://www.academia.edu/4061034/_Informal_Traditional_Justice_System

3.6 key challenges

Encroachment and illegal logging

Encroachment and illegal logging in the Mau forest is one of the greatest challenges facing both conservationists and government. Thousands of acres of forested land are lost every year in Kenya. The Mau forest has lost the highest number of acreage since 2001. Charcoal burning is one of the worst causes of deforestation in the Mau forest now. This is encouraged by the presence of indigenous hard wood within the forest. On the other hand, illegal logging is also on the increase. Scrupulous executives are using fogged logging permits to access the forest. The absence of an automated license verification tool has made it hard for forest officers on the ground to determine the validity of logging licenses. Politicians have also been encouraging their constituents to settle in the forested areas with an intention of gaining political mileage¹²⁴.

Increasing demand for agricultural land

At independence, the government realized that there was a great shortage of agricultural land. This led to the establishment of the shamba system with the aim of reducing costs incurred by the forest department through plantations. Farmers were awarded land to till but with an agreement to plant trees, take care of them, and till they shaded the crops. The shamba system was a good idea that helped alleviate food security. This great idea ended up becoming a threat to the survival of the forest in the late 1980's. Farmers started moving in to the cleared areas and settled. This caused more destruction and deforestation as more settlers moved into the forested areas. In the 1990's the government modified the shamba system by introducing the Non-resident cultivation to enhance forest plantations. This was also meant to reduce claims by residents of being squatters in the land. The demand for agricultural land has increased immensely in the past decade. This is because population of communities in Kericho and Bomet counties were pushed into smaller portions of land to create land for tea by the colonialists. The increased population has pushed many families into poverty and thus

¹²⁴ Kiplang'at. K.(2016)*The hurdles to saving Mau forest*. The Star, Kenya. Retrieved 19 September 2016, from http://www.the-star.co.ke/news/2016/09/19/the-hurdles-to-saving-mau-forest_c1422333

the need to look for an alternative source of livelihood¹²⁵. This has caused a massive migration of young adults from both Bomet and Kericho counties into the Mau forest¹²⁶.

High demand for wood

The populations around the Mau forest depend on wood as a source of fuel. As the population increase, the demand for wood for building and fuel grows as well. The biggest logging companies are also located around the Mau forest. Timsales and Comply companies are located in Elburgon, in Nakuru County. The modern logging methods is a great danger to forested areas. The traditional logging methods allowed young trees to grow to maturity. The modern methods clear forests without allowing for natural regeneration. The rate of deforestation has also increased because of the types of machinery in use. Companies are also encouraging plantations of single species trees that mature faster; this has endangered the growth of indigenous forest because they take long to mature¹²⁷.

Tea factories are also using a lot of wood fuel to generate thermal energy that is used to dry tealeaves. Between 2008 and 2013, KTDA factories had used over 3,927,939 m³ of wood in its 65 factories. In the last five years it is estimated that it has used over 4,000,000 m³ of wood fuel. This estimation is based on KTDA factories only, private factories also utilize wood fuel for thermal energy generation¹²⁸.

Political factors

Politics has played a major role in the destruction of the Mau forest. The forest has been used by successive governments to bribe or as a repayment for political patronage. Since independence, land has been used as a reward especially for the rich who are politically connected. In the Mau, land that was meant for the poor has always ended in the hand of the rich. The entry of multiparty politics in the 1990's accelerated politician's appetite for forested land. Many politicians were afraid of losing their political positions and going home empty handed. Political appointees like ministers were used to acquire land because of the

¹²⁵ Obare L. Wangwe. J.(2016)Underlying Causes of Deforestation: Kenya. Retrieved 19 September 2016, from <http://www.wrm.org.uy/oldsite/deforestation/Africa/Kenya.html>

¹²⁶ Obare L. Wangwe. J.(2016)Underlying Causes of Deforestation: Kenya. Retrieved 19 September 2016, from <http://www.wrm.org.uy/oldsite/deforestation/Africa/Kenya.html>

¹²⁷ Haugen, David E. (2013). *Kansas Timber Industry: An Assessment Of Timber Product Output And Use*, 2009.

¹²⁸ Ngunjiri .J (2016). *KTDA factories roll out plan for reliable wood fuel*.Retrieved 25 September 2016, from <http://www.businessdailyafrica.com/Corporate-News/KTDA-factories-roll-out-plan-for-reliable-wood-fuel/539550-1842904-8ptm1m/index.html>

powers they wielded. Politicians also exploited weak laws that were in place at the time. A good example is the power given to the minister by the forest act, which gave the minister the ability to alter boundaries and publish it in the Kenya gazette¹²⁹.

This publication was never accessed by the locals and thus were never aware of what was happening. The gazette was to last for 28 days and if there was no objection the land was deleted from the list of protected forest. It is the weak laws that gave politicians a leeway to divide land amongst themselves and their cronies.¹³⁰ In Kiptagich, Olenguruone, 1812 hectares were degazetted with an aim of settling the members of the indigenous Ogiek community but it ended benefiting the political elite including the president himself¹³¹.

3.7 Conclusion

Saving the Mau forest requires a concerted effort by both the government and the local communities. There is also need to involve the locals when making decisions that affect their livelihood and on matters pertaining to conservation. The survival of the forest is dependent on separation of politics and conservation. There is also need to strengthen laws governing forestland to prevent further encroachment into forested areas.

¹²⁹ Klopp. J., Sang.K., (2016). *Maps, Power, and the Destruction of the Mau Forest in Kenya*. Retrieved 19 September 2016, from <http://www.columbia.edu/~jk2002/publications/KloppS11.pdf>

¹³⁰ *ibid*

¹³¹ The Nairobi Chronicle. (2009). *Mau Forest politics: a detailed explanation*. Retrieved 19 September 2016, from <https://nairobiChronicle.wordpress.com/2009/07/30/mau-forest-politics-a-detailed-explanation/>

CHAPTER FOUR:

A CRITICAL ANALYSIS OF THE DATA

4.1 Introduction

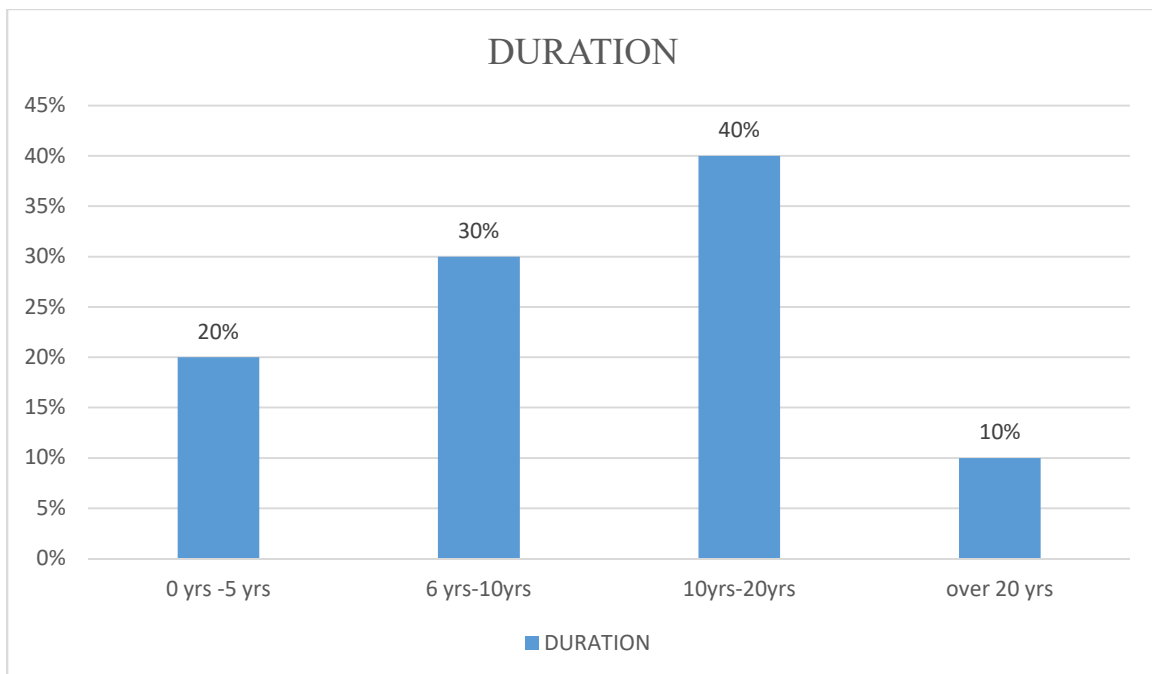
This chapter looks into the environmental issues identified within the area of study. It displays the general data about environmental scarcity and resolving conflicts in the horn of Africa using the case of the Mau forest. Moreover, the demographic attributes in Mau are portrayed. The information has been displayed using tables and diagrams, which interpret the findings.

4.2 Demographic

4.2.1 Duration of living or working in the area

The study outlines the duration that the respondents had worked at Mau ecosystem. The findings are as shown in the figure below.

Figure 4.1: Duration of living or working in the Mau complex



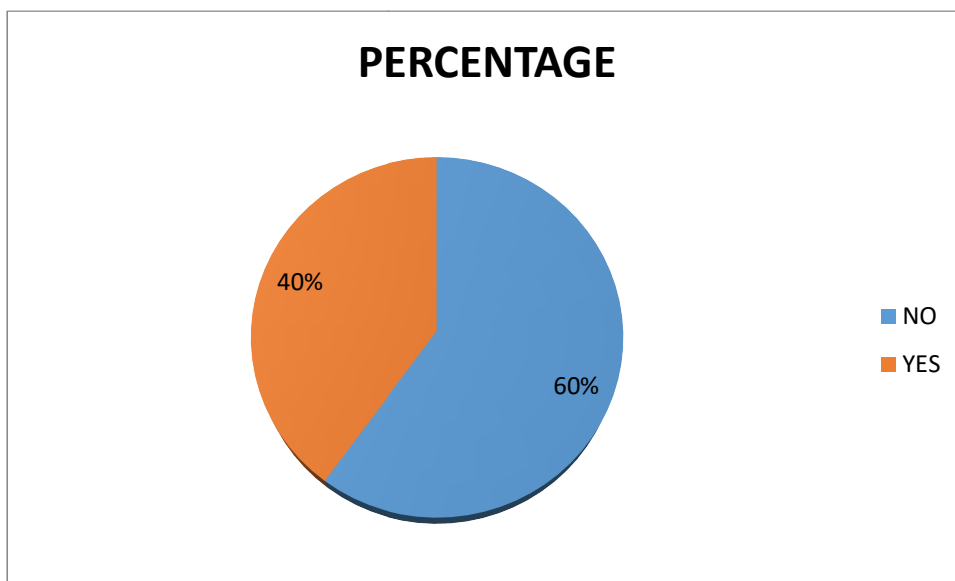
Source (author 2016)

The study found out that 40% of the respondents had lived in the complex for more than 10 years while 30% had lived or worked for 6-10 years. 20% had lived in the Mau for less than 5 years while the remaining 10% had stayed for a period of over 20 years.

4.2.2 Awareness of environmental resource related problems in the Mau Forest

Having established the respondent's duration of stay in the Mau, the study sought to know whether the respondents knew of any environmental resource conflict in the Mau Forest. The findings were as shown in the figure below.

Figure 4.2: Awareness of environmental or resource related conflicts in the Mau Forest



Source (author 2016)

The study found out that a majority 60% were not aware at all about environmental resource related conflicts in the Mau Forest. The remaining 40% were aware of environmental resource related conflicts in the Mau Forest.

4.3 Environmental concerns

It was also important for the research to find out whether the respondents were in agreement with the statements on the concerns that might be a source of conflict in the Mau forest. The rating was as follows: 1- Very low extent, 2- Low extent, 3- moderate extent, 4- great extent and 5-very great extent. SPSS generated the mean and standard deviations and are displayed in the table below.

Table 4.1: Environmental concerns

	Mean	S.D
Human activity has affected the ecological situation in the Mau forest.	4.65	0.501
Agricultural land has reduced due to rapid increase in human population thus affecting livelihoods.	3.54	1.062
Erratic weather patterns and flooding have been caused by Increased forest depletion in the Mau forest	4.63	0.834
Animal and human wellbeing have been affected by water scarcity	4.52	1.014
Poor health in children and adults is due to Inadequate health facilities	3.78	1.211
crop output has been declining due to increased soil degradation	3.65	1.805

Source (author 2016)

It is very clear from the table that many respondents agree that population increase has contributed to conflict because of reduced access to land which has affected their livelihoods. Human activities has also affected the ecological balance while the health sector is overwhelmed due to the high number of people and few health facilities as indicated by the mean scores of 4.65, 4.63 and 4.52 respectively. Most of the respondents were also in agreement with the fact that forest depletion has led to erratic whether patterns and flooding. Many agreed that soil degradation has been on the increase and that it has affected food production as indicated by the mean scores of 3.78, 3.65 and 3.54 respectively.

4.4 Non- Environmental Concerns

The respondents were also asked to indicate their level of agreement with the following statements concerning Non- Environmental Concerns in the Mau forest conflict. The response was recorded in the following order: 1- Very low extent, 2- Low extent, 3- moderate extent, 4- great extent and 5-very great extent. SPSS generated the mean and standard deviations and are displayed in the table below.

Table 4.2 Non- Environmental Concerns

	Mean	S.D
Increased tension among the communities is because of high unemployment in the Mau as compared to other regions.	3.72	1.129
Some communities are advantaged in terms of access to education when compared to others in the Mau.	4.92	1.240
Animosity along tribal lines is as a result of skewed resource allocation	4.83	1.213
Favoritism and lack of political freedom has led to poor political representation.	4.89	1.996
Skewed budgetary allocation for infrastructure has been a source of tensions.	3.33	1.116

Source (author 2016)

As indicated in the table, majority of the respondents were of the opinion that the level of unemployment in the Mau forest is high compared to other regions. This is contributing to the conflict in the area as individuals looked for a means to support their livelihoods; on the other hand, the respondents believe that budgetary allocation for infrastructure development is skewed and that some areas were more developed than others were. The results were as indicated by the mean scores of 4.92, 4.89 and 4.83 respectively. Consequently, many respondents agreed that lack of equity in allocation of resources in the region has been a cause of conflict along tribal lines. They also agreed that representation in the Mau has not been fair because some communities were favored as indicated by the mean scores of 3.72 and 3.33 respectively.

4.4.1 Other concerns affecting people in the Mau Region

Human activities such as agriculture, construction of roads and buildings has led to hardening of the soil surface. This has increased poor seepage of water into the ground storage. The runoff has also increased soil erosion, which in turn lead to soil degradation and consequently poor yields. The nearby lakes have also been affected by siltation, a situation that occurs due to massive soil erosion. This has led to the growth of hyacinth, a seaweed that covers the water surface. The hyacinth prevents the growth of the blue-green algae (*spirulina platensis*), which forms the main food for flamingo birds. Lack of food has led to the migration of

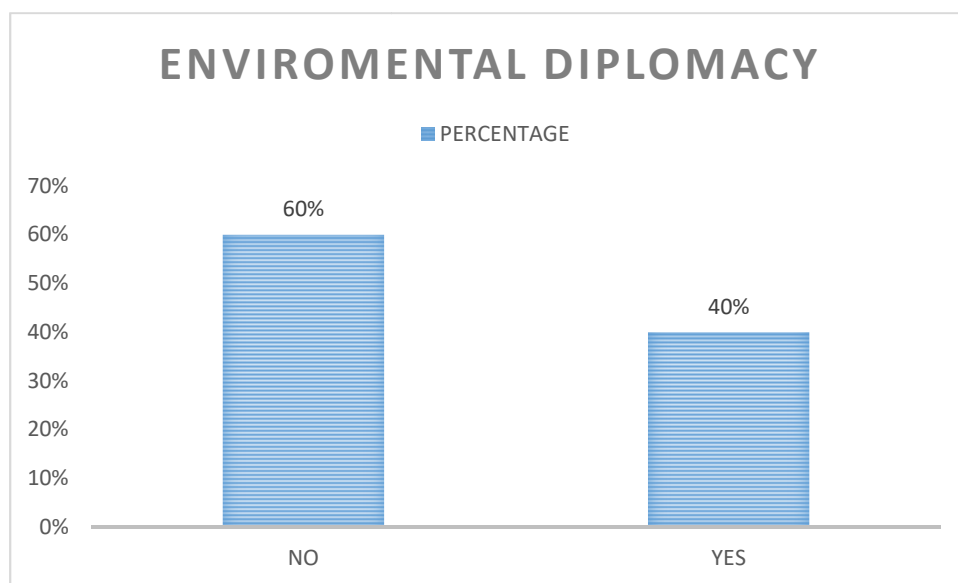
flamingoes to Lake Natron in Tanzania and therefore causing a reduction in revenues associated with tourism.

The clearing of forest cover for has disrupted the hydrological cycle through increased evaporation and runoff process because of the bare ground.

4.4.2 Adoption of Environmental diplomacy in the Mau

It was also important for this research to establish if environmental diplomacy has succeeded in resolving environmental conflict in the Mau forest. The findings are presented in the figure below.

Figure 4.3: Environmental diplomacy adopted in the Mau



Source (author 2016)

The study found out that majority of the respondents (60%) agreed that environmental diplomacy had been used in the Mau as a tool for solving environmental conflict while 40% opposed this. The respondents also indicated that the international community was willing to assist the government to resolve the Mau conflict through diplomatic approaches.

4.5 Environmental Diplomacy in the Mau forest

The following are some of the diplomatic approaches used to resolve the Mau conflicts.

4.5.1 Establishment of Community Forest Association at the location level

The study found out that majority of the respondents were of the opinion that a more community forest association (CFA) should be established at the location level to help in preventing conflicts. They also wanted the committee to protect and manage the forest. The

inclusion of the local community members in the CFA has helped resolve conflicts because they understand the problems facing the community. They have also given the community a chance to benefit from the forest resources as well as educate them on the benefits of conservation.

4.5.2 Needs of all the inhabitants of the Mau be addressed through enhancement of local institutions such as hospitals, schools and administrative units.

The study found out that enhancement of social amenities that were very necessary for the local community such as hospitals, schools and administrative units were more accessible to the local communities. It was because of this that community welfare, education was improving, and that the availability of these institutions was leading to more people settling in the area thus leading to more degradation as the populations' demand for food increased.

4.5.3 Empower rural communities to sustainably manage forest resources to prevent related disputes through Development of technical administrative and entrepreneurial activities

The respondents were also of the opinion that the pilot projects started by the Kenya forest service were positively contributing towards reduction of pressure on the environment by providing alternative sources of livelihoods. This was done through small businesses such as sale of tree seedlings and also using the CFA's to establish other capacity building projects, which were used to offer grants.

4.5.4 In order to prevent the explosion of the conflicts, resources in financial and entrepreneurial sectors be mobilized to help in resolving any conflict however small.

The research suggests that both local and international partners gave CFAs support to establish an elaborate development of nurseries that were aimed at enhancing the rehabilitation of the destroyed parts of the forest. These nurseries were also aimed at creating job opportunities for the local population and thus prevent explosion of conflicts.

Environmental partners such as the green belt movement had shown interest and willingness to ensure that the Mau forest was restored.

4.5.5 Thorough evaluation of the existing environmental degradation and conflicts in the Mau Forest

This study found out that the Mau complex is a source to 12 rivers that drain its waters to several lakes within the east African region. Therefore, it is one of the most important towers in the region. The research also found out that as much as the government is working hard to conserve the forest, the local community is also working hard to benefit from the scarce resources that the forest has to offer. The composition of the inhabitants of the forest makes resolution very complex. The inhabitants range from the Indigenous inhabitants (Ogiek) who have a right to live in their ancestral land under international law and through UN declaration on the rights of indigenous people. Encroachers forms another group that is harder to deal with because they are in the forest to make a living through charcoal burning and agricultural activities. The political elite then form a group that is more destructive than the first two. They own logging companies and green house farming which is having a great impact on the water sources in the area. The study also found out that there has been a decline in tourist revenue owing to the migration of flamingoes from Lake Nakuru to Tanzania. This has been attributed to siltation, which has affected the growth of blue-green algae, which is the main food to the flamingoes. Therefore, there the migration has caused a biodiversity change while agricultural activities has disrupted the hydrological cycle thus erratic rainfall patterns. Reduction in ground cover has also increased the rate of evaporation and the ability of the soil to hold moisture. Ground aquifers have also been affected by the bare soil, which allow runoff and minimal retention of water. Research has shown that sometimes water tables may rise in deforested areas due to reduced evaporation. In some cases, the opposite happens when the water table falls because of poor infiltration. Substantial reduction in the infiltration capacity may lead to severe cases of desertification in the end¹³².

¹³² Walton, W. C., (1970) *Groundwater Resource Evaluation.*, McGraw-Hill, New York,

4.5.6 Establishing the extent to which Kenya is involved in international environmental diplomacy towards resolving environmental degradation and conflicts at the Mau Forest

The importance of the Mau forest was exhibited when rivers and lakes that depend on this forest started drying up. The international community saw this as a threat to the security of the region and thus poised their concern. It was after this that the Kenyan government took action and created the Mau forest task force. The task force proposed that all forested lands be placed under the Kenya forest service. Substantial steps have since been taken by KFS towards addressing the degradation problem through reforestation of the destroyed parts of the problem. The research found out that solving the Mau forest conflict required solutions developed through systems of environmental diplomacy. This involves governance mechanisms that bring together all the parties. The state should also avoid state centered strategies that are aimed at rapid economic growth, because this may blind other important aspects that are needed to achieve a solution.

4.5.7 The need to establish the role of environmental diplomacy in resolving environmental conflicts in the Mau escarpment.

Environmental diplomacy demands that there should be no sole decision making that pertains to resolving of environmental conflicts. Therefore, the formation of the Mau Forests Complex Authority (MFCA) was guided by this concept whereby the board of directors was to have representatives from all sectors that depended directly on the Mau forest resources.

4.5.8 Boundary surveys, issuance of title deeds, monitoring and enforcement

The most important means of saving the Mau forest was to first demarcate legal boundaries. This research discovered that the communities took advantage of the unknown borders to encroach further into the forest. After the demarcation, it was necessary to monitor and prevent further encroachment. To prevent this from happening the task force tasked the Nyayo tea zone to create a buffer zone using tea plantations.

4.5.9 Relocation, resettlement and livelihood support and development

To save the Mau, the government took an initiative of relocating evictees who were living in the protected areas of the forest. Those who did not manage to get alternative land were provided with cash to buy land in a place of their choice. To lessen the burden of relocation the government also provided building material to the relocated families. Families were also provided with food rations as a means of safeguarding their livelihoods as they settled down.

4.5.10 Public awareness and community sensitization

The sensitization exercise was meant to make the local community aware of what was happening. This was done to avoid creation of more avenues for conflict. It was also a means of addressing the needs of the local population through employment opportunities that enabled them to sustain their livelihoods. The employment activities development of tree nurseries that were later used to rehabilitate the forest.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

This research established that many of the respondents have been residents in the Mau forest for more than fifteen years. A majority of the respondents indicated that they migrated into the Mau from other counties within the region. Only 10% of the respondents indicated that they were born in the Mau forest and that most of their family generations were born there. This was an indication that this small percentage represented the indigenous inhabitants of the Mau forest.

The research also established that 60% of the respondents were not aware of environmental related conflicts affecting the Mau forest. This indicates that the massive destruction in the Mau forest may be because of ignorance or a community that is ill informed about the effect of destroying the forest. Many respondents agreed that the increase in human population had increased competition for the scarce resources in the Mau forest. The population had also overwhelmed the few available health facilities in the area. There was also agreement among the respondents that soil degradation has increased due to human activities.

It was also established that the high levels of unemployment was a source of conflict in the Mau forest. This was attributed to individuals looking for a way to satisfy their daily needs through crime. Skewed resource allocation towards infrastructural facilities was also cited as a source of conflict along ethnic lines. Unfair political representation was also cited as a source of poor resource distribution and thus some areas were more developed than others.

The research also agriculture was leading to hardening of the soil surface, which led to poor seepage of water into the ground storage. The runoff also increased soil erosion, which in turn led to soil degradation and consequently poor yields. Erosion affected the nearby lakes through siltation. This led to the growth of hyacinth, a seaweed that covers the water surface. The hyacinth prevents the growth of the blue-green algae, which forms the main food for flamingo birds. Lack of food has led to the migration of flamingoes to Lake Natron in Tanzania and therefore causing a reduction in revenues associated with tourism.

The study found out that majority of the respondents (60%) agreed that environmental diplomacy had been used in the Mau as a tool for solving environmental conflict while 40%

opposed this. The respondents also indicated that the international community was willing to assist the government to resolve the Mau conflict especially those that were concerned with environmental issues. The respondents were of the opinion that more community forest association (CFA) should be established at the location level to help in preventing conflicts. They also wanted the committee to protect and manage the forest because the inclusion of the local community members in the CFA has helped to resolve conflicts.

The study found out that enhancement of social amenities that were very necessary for the local community such as hospitals, schools and administrative units were more accessible to the local communities. It was because of this that community welfare, education was improving, and that the availability of these institutions was leading to more people settling in the area thus leading to more degradation as the populations' demand for food increased. The respondents were also of the opinion that the pilot projects started by the Kenya forest service were positively contributing towards reduction of pressure on the environment by providing alternative sources of livelihoods. This was done through small businesses such as sale of tree seedlings and also using the CFA's to establish other capacity building projects, which were used to offer grants.

The research found out that both local and international partners gave CFAs support to establish nurseries that were aimed at enhancing the rehabilitation of the destroyed parts of the forest. These nurseries were also aimed at creating job opportunities for the local population and thus prevent explosion of conflicts. Environmental partners such as the green belt movement had shown interest and willingness to ensure that the Mau forest was restored.

5.2 Conclusion

The horn of Africa has been affected by conflicts that vary in impacts and contexts. These conflicts pertain to conservation of forests and protected areas, access to watering points and pasture and migration caused by environmental changes leading to conflicts in the receiving areas. Most of the communities in these conflict areas are made vulnerable by poverty and marginalization. This makes them dependent on environmental resources and thus are extremely affected by the scarcity of these resources. The dependence on the environment for food and fuel leads to degradation and ultimately to conflict. This cycle continues as long as the use of natural resources is faster than the renewal. From the review of literature the

research found out that environmental resources in the Horn of Africa are more vulnerable in times of conflict. This has therefore been exploited by actors who commercialize conflict. These actors include; arms traffickers, multinational cooperation's, traders in precious stones and sometimes non-governmental organizations. The emergence of climate change has worsened the situation through making natural resources like water scarcer. Border conflict in the Horn of Africa should be dealt with proactively before they become full blown wars. This can be done through regional bodies like IGAD and the AU.

The destruction of the Mau system is a threat to regional security because of the effects caused by the erratic weather changes. Riparian countries that depend on water from the Mau forest are afraid that they will be hit by water shortages if the destruction continues. It is therefore very important for the government to take drastic actions that are aimed at protecting the Mau forest. The Kenyan economy has also been affected through the tourism industry. Flamingoes are now moving to the neighboring country due to insufficient food in our lakes. Tourism is one of the highest foreign exchange sectors that bring a lot of revenue into the country. For the country to continue benefiting from this sector a lot has to be done towards restoring the forest. To sustain the restoration, the involvement of the local communities in decision-making is very important.

Therefore, more CFAs should be created so that all areas within the Mau forest are involved. Revenue generating activities should also be introduced to ensure that the livelihoods of the communities are well taken care off.

The study found out that enhancement of social amenities that were very necessary for the local community such as hospitals, schools and administrative units were very important to the local community. The absence of such amenities had a negative economic effect on the population. The Kenya forest service has also been seen to be doing a good job in restoring the forest and putting in place measures to protect it.

5.3 Recommendations

The effects of environmental conflicts are detrimental to human survival and thus more research should be done with the aim of developing strategies and new mitigation models. These strategies should be directed at reducing environmental related aspects that lead to conflict. This research also found out that politics and environmental related conflicts go hand in hand. It is therefore important to ensure that there is political will in dealing with

environmental related conflicts. Environmental conflicts are complex and may significantly affect the stability of a state. Weak state on the other hand increases the magnitude of environmental related conflicts. This therefore calls for strengthening of political structures.

A lot more effort should also be put into managing conflicts between pastoral communities within the region. This can be done through enhancing availability of water in dry areas and other long term efforts that will help the communities manage environmental scarcities. Pastoral conflicts between communities of states that share a border call for more collaboration between the states involved. This will help in enhancing the sharing of information that can help to quell emerging tensions. States should also develop policy frameworks that will give a guidance on how to empower the pastoral communities. As indicated earlier in this research, the local communities should be involved in decision-making.

It is evident from the findings that saving the Mau is the most important thing in government arms at the moment. It is therefore necessary to put in place measures that will ensure that the local communities participate more in the restoration and protection of the forest. It is also important to make sure that the livelihoods of the local community are secured through ensuring that revenue-generating activities are made available. It is important to ensure that the indigenous community is catered for when arranging for relocation or compensation.

The use of Alternative dispute resolution mechanisms such as negotiation, fact-finding facilitation and mediation have been seen to be improving the situation in the Mau forest. This mechanism allows parties to determine the outcome of the process using their own terms. This mechanism has proved that it can work and therefore, using it will increase the chances on making better inroads.

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Research Questionnaire

Dear Respondent

RE: RESEARCH DATA COLLECTION

I am pursuing Masters Degree at the University of Nairobi's institute of diplomacy and international studies. In partial fulfillment of the requirement for the award of the degree, I am undertaking an academic research on the Environmental resource scarcity as a source of conflict in the horn of Africa. In this light, you have been selected to be part of this study. I would therefore, appreciate if you could spare some of your time to fill the attached questionnaire and answer the questions as honestly as possible. Since the research is purely academic, the information provided will be treated with high degree of confidence and strictly for academic purposes.

I look forward to your co-operation in this exercise.

Yours sincerely

Non-Environmental Concerns	1	2	3	4	5
Increased tension among the communities is because of high unemployment in the Mau as compared to other regions.					
Some communities are advantaged in terms of access to education when compared to others in the Mau.					
Animosity along tribal lines is as a result of skewed resource allocation					
Favoritism and lack of political freedom has led to poor political representation.					
Skewed budgetary allocation for infrastructure has been a source of tensions.					

6.) What other concern, not mentioned above, affects you in the Mau Region (please explain)

.....

7) As one of the tools for resolving the environmental conflicts, in your opinion, has the environmental diplomacy been adopted in the Mau successfully?

a) Yes [] b) []

Please expound on your

answer.....

.....

PART B: Environmental Diplomacy at Mau

8) The following are some of the diplomacy approaches that can be employed in managing the conflict in the Mau. Please indicate how the following initiatives have helped in reducing the environmental conflict in the Mau.

i. The establishment of local community environmental committees coming from all the communities in the region.....

ii. The enhancement of local institutions such as hospitals, schools and administrative units that will address the needs of all the inhabitants of the Mau

.....

iii. The need to develop human, technical and administrative capacity to develop sustainable management plans and to implement these plans to enable the local community to fulfill their management tasks and prevent resource-related disputes

.....
.....

iv. The need to come up with a fund that will help in resolving any conflict however small in order to prevent the explosion of the conflicts in the region.

.....
.....

v. What other suggestion can you give in resolving the environmental conflict in the Mau?

.....

Thank You for Your Time