

**DOMESTICATION AND APPLICATION OF BIODIVERSITY RELATED MULTILATERAL
ENVIRONMENTAL AGREEMENTS (MEAs) IN KENYA**

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DECLARATION

This thesis is my original work and has never been presented for examination or degree award in any other University.

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DEDICATION

To my late father, Suresh Karamshi Shah who was always supportive of me to rise to greater heights in all endeavours and to our late family friend, Peter Njenga, who always supported the family morally and spiritually.

ACRONYMS

ACC	African Conservation Centre
AMCEN	African Ministerial Conference on the Environment
ASALs	Arid and Semi Arid Lands
ASFMP	Arabuko Sokoke Strategic Forest Management Plan
asl	Above sea level
ASN	Aviation Safety Network
ASSETS	Arabuko Sokoke Schools and Ecotourism Scheme
AWF	African Wildlife Foundation
BCC	Baringo County Council
BPSP	Biodiversity Planning Support Programme
BSP	Biodiversity Support Program
CAMPFIRE	Communal Area Management Programme for Indigenous Resources
CBD	Convention on Biological Diversity
CBOs	Community-based Organisations
CCN	City County of Nairobi
CFCU	Coastal Forest Conservation Unit
CID	Criminal Investigation Department
CISDL	Centre for International Sustainable Development Law
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna
CMS	Convention on the Conservation of Migratory Species of Wild Animals
CONAGEBIO	National Biodiversity Administration Committee
CoP	Conference of Parties
CRA	Commission on Revenue Collection
DEAT	Department of Environmental Affairs and Tourism
DFID	Department for International Development
DRC	Democratic Republic of Congo
DRSRS	Department of Remote Sensing and Resource Surveys
DWAF	Department of Water Affairs and Forestry
EAC	East African Community
EIA	Environmental Impact Assessment
EMCA	Environmental Coordination and Management Act
EU	European Union
FAO	Food and Agriculture Organisation
GBF	Global Biodiversity Forum
GCFA	Gede Community Forest Association
GEF	Global Environment Facility
GoK	Government of Kenya
GoR	Government of Rwanda
IBA	Important Bird Area
ICT	Information and Communication Technology
ICZM	Integrated Coastal Zone Management
IEA	Institute of Economic Affairs
IFAW	International Fund for Animal Welfare
IIED	International Institute for Environment and Development

INECE	International Network for Environmental Compliance and Enforcement
INTERPOL	International Police
IPP	Individual Policy Prescriptions
IUCN	International Union for Conservation of Nature
JICA	Japan International Cooperation Agency
JKIA	Jomo Kenyatta International Airport
CAA	Kenya Airports Authority
KCC	Koibatek County Council
KEFRI	Kenya Forest Research Institute
KEPHIS	Kenya Plant and Health Inspection Service
KFDA	Kenya Fisheries Development Authority
KFS	Kenya Forest Service
km	Kilometres
KMFRI	Kenya Marine and Fisheries Research Institute
KNBS	Kenya National Bureau of Statistics
KNEC	Kenya National Examinations Council
KPA	Kenya Ports Authority
KRA	Kenya Revenue Authority
KShs	Kenya Shillings
KWCA	Kenya Wildlife Conservancies Association
KWS	Kenya Wildlife Service
KWSTI	Kenya Wildlife Service Training Institute
MA	Millennium Ecosystem Assessment
MAB	Man and Biosphere
MCS	Monitoring Control and Surveillance
MEAs	Multilateral Environmental Agreements
MEMR	Ministry of Environment and Mineral Resources
MEWNR	Ministry of Environment, Water and Natural Resources
MIFOR	Ministry of Forestry
MINEPDED	Ministry of Environment, Protection of Nature and Sustainable Development
MINITERE	Ministry of Lands, Environment, Forestry and Mines
MMNR	Maasai Mara National Reserve
MoU	Memorandum of Understanding
MPAs	Marine Protected Areas
NBSAP	National Biodiversity Strategy Action Plan
NCAPD	National Coordination Agency for Population and Development
NCC	Narok County Council
NEAP	National Environmental Action Plan
NEMA	National Environment Management Authority
NEMBA	National Environment Management Biodiversity Act
NES	National Environment Secretariat
NFA/NAFA	National Forest Authority
NGOs	Non Governmental Organisations
NMK	National Museums of Kenya
OECD	Organization for Economic Co-operation and Development
OISI	Obligation Integration Susceptibility Index
OPPII	Obligation Policy Prescription Integration Index

PAs	Protected Areas
PPISI	Policy Prescription Integration Susceptibility Index
Ramsar	Convention on Wetlands of International Importance especially as Waterfowl Habitat
REMA	Rwanda Environment Management Authority
RoC	Republic of Cameroon
RoG	Republic of Ghana
RoM	Republic of Mozambique
RoSA	Republic of South Africa
RoU	Republic of Uganda
SADC	Southern African Development Community
SANBI	South African National Biodiversity Institute
SANPB	South Africa National Parks Board
SoK	Survey of Kenya
SPSS	Statistical Package for the Social Sciences
TANAPA	Tanzania National Parks Authority
TBNRM	Transboundary Natural Resource Management
TMCC	Trans Mara County Council
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNCHE	United Nations Conference on Human Environment
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
URT	United Republic of Tanzania
US\$	American Dollar
USAID	United States Agency for International Development
UWA	Uganda Wildlife Authority
WCK	Wildlife Clubs of Kenya
WCMC	World Conservation and Monitoring Commission
WEHAB	Water, Environment, Health, Agriculture and Biodiversity
WFC	World Future Council
WHC	World Heritage Convention
WMA	Wildlife Management Areas
WMD	Wetlands Management Department
WPC	World Parks Congress
WRI	World Resource Institute
WSSD	World Summit on Sustainable Development
WWF	World Wide Fund for Nature

ABSTRACT

World biodiversity is decreasing at an unprecedented rate. This challenge has raised the need for global policy intervention in the form of biodiversity related Multilateral Environmental Agreements (MEAs). Biodiversity MEAs have enabled developing countries to improve environmental governance through the implementation of national policies. The problem being investigated was that in spite of Kenya being a signatory to all biodiversity MEAs and having many biodiversity related policies and legislations; its biodiversity is declining. The aim of the study was 1) to evaluate the domestication and integration in the national policies of the following five biodiversity MEAs in Kenya (a) Convention on Biological Diversity (CBD), (b) Convention on International Trade in Endangered Species of Plants and Animals (CITES), (c) Convention on Conservation of Migratory Species of Wild Animals (CMS), (d) Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) and, (e) World Heritage Convention (WHC); 2) assess capacity of MEA focal institutions; 3) establish the achievements and challenges in selected MEA study sites including MEA designated and tentatively listed sites and the country's points of entry and exit; and 4) assess the level of MEA awareness amongst the local communities. The general hypothesis used to guide the study objectives was that MEAs were poorly reflected in national biodiversity policies and poorly implemented at institutional levels, hence the continued loss of biodiversity in Kenya.

To realize the study objectives, literature review was done on the biodiversity MEA implementation and a conceptual framework was developed. Field data collection was done using random sampling for household respondents in the MEA study sites and purposive sampling for institutional focal respondents and other government officials. A total of 20 institutional and 2,109 household respondents were sampled from the study sites. The data was subjected to descriptive statistics so as get measures of distribution tendencies, dispersions, differences and associations and inferential statistics, namely Kruskal-Wallis H-test to test the hypothesis that MEAs are poorly reflected in national biodiversity policies at institutional levels; Chi-square to test the hypothesis that there is no difference between the local people's MEA awareness with the distance from the conservation and operational areas and Paired t-test to test the hypothesis that there is no difference in the typology of threats affecting the domestication and application of various biodiversity MEAs in Kenya.

Comprehensive policy analysis of domestication and application of global biodiversity MEAs at national level indicated that the CITES ranked the top with 24.8% integration of global obligations, followed by the CBD (20.9%), CMS and WHC (19.1% each) while the Ramsar Convention had the lowest integration status (18.8%). The study established that domestication and implementation of biodiversity MEAs in Kenya is weak because not all MEA obligations are addressed in the biodiversity policies. Furthermore the study also found that many biodiversity related policies which are supposed to serve as vehicles for the MEA domestication and implementation are in the draft form and are yet to be ratified by the national government.

The study findings further indicated that the Ramsar Convention had the best capacity at 83.3% in terms of highly educated and long serving staff, funding, vehicles and ICT followed by the CBD (66.7%) and the CITES, CMS and the WHC having 50% of the needed capacity each. In terms of public awareness, education was found to play the most important role in creating public awareness of MEAs, with the Ramsar Convention ranking the top at 97.1%, followed by the CITES at 90.6%, CBD at 87.6%, WHC at 54.2% and CMS ranking the lowest at 0.8%. Similarly the aspect of distance from the MEA sites was also found to play an important role. The results indicated that as one moves further away from the MEA sites, the less aware one becomes of the MEAs. In terms of gender, results indicated that males were better aware of the MEA status than the females. The findings on the level of MEA awareness was better for shorter duration of residence around the MEA sites as the message of MEAs had been spreading in the last few years.

On the overall, institutional capacity was found to be generally poor in terms of personnel, vehicles and funding. Furthermore the institutional capacity responsible for implementing the biodiversity policies was weak in terms of public involvement in biodiversity conservation. Formal education was found to play a significant role in the level of MEA awareness by the citizenry. Based on the findings of this study, recommendations include amendments in the already gazetted policies, adopting draft policies, improving institutional capacity, involving communities more at grassroot levels and having more environmental education institutions to cater for environmental awareness around MEA sites.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Biodiversity is an important aspect of the natural heritage, especially for tropical countries like Costa Rica, Brazil, Indonesia, Madagascar, Democratic Republic of Congo (DRC) and Kenya, which have a wide diversity of flora and fauna. This rich biodiversity has the potential to provide various opportunities for the people who continue to depend on biological resources for their livelihoods (Swiderska *et. al.*, 2008). Approximately, 1.6 billion people worldwide rely on forest resources; 150 million rely on wildlife and 200 million derive their livelihood from fishing (Millennium Ecosystem Assessment [MA], 2005). However, with biodiversity loss, both the rich and the poor are bound to suffer serious losses in terms of supply of essential goods and services. But the impact is likely to fall heavily on the poor as they are more directly dependent on biodiversity for their survival (Secretariat of the Convention on Biological Diversity [CBD], 2010).

Biodiversity is considered as a “life insurance asset” because it supports most functions of human life on Earth (McNeill & Shei, 2002; UN, 2002). But today this very biodiversity is decreasing at an unprecedented rate worldwide. Its conservation is increasingly becoming a concern for most governments. In many areas, the rate of species extinction is estimated to be over 10,000 times higher due to human interference (Pimm & Raven, 2000; MA, 2005; Rockström *et. al.*, 2009). This scenario is common in the Kenyan context as well as other nations of the world and the challenge has raised the need for global policy intervention in the form of biodiversity related Multilateral Environmental Agreements (MEAs) at international level. However, although many nations of the world have been working towards the conservation of species and ecosystems through signing of international treaties and conventions in form of MEAs, the results are not very progressive (UNEP, 2010). The impact of MEAs is expected to trickle down to national and local levels in form of national legislations at institutional and community awareness and benefits (Leff, 1995).

Biodiversity MEAs have been in place since 1900 when the London Convention for Protection of Wild Animals, Birds and Fish in Africa was ratified. More MEAs have been set up since the 1972 United Nations Conference on Human Environment (UNCHE) in Stockholm (UNEP, 2010). The MEAs range from legally binding to non-legally binding documents. Legally binding MEAs are accepted at worldwide level while non-legally binding MEAs are based at country level. Legally

binding MEAs are usually in form of treaties, conventions, agreements, protocols or accords and set commitments in form of legally binding targets and timetables. Non-binding MEAs are in form of resolutions, decisions, declarations and recommendations (UNEP, 2007; 2010).

All MEAs are handled by the United Nations (UN) through its agencies such as the United Nations Environment Programme (UNEP) and the United Nations Educational, Scientific and Cultural Organisation (UNESCO) whose mandates include coordinating related programs, projects and plans within the UN and act as catalysts for sustainable development. The MEAs are further coordinated by the Commission on Sustainable Development which was established in 1992 and has its headquarters at the UN in New York. This Commission caters for the three pillars of sustainable development, which are environmental protection, social development and economic growth. Other organisations dealing with MEAs' implementation are the United Nations Development Programme (UNDP), the World Meteorological Organisation which deals with atmosphere and climate and the Food and Agriculture Organisation (FAO) which deals with issues pertaining to agriculture and fisheries. The compliance status for the MEAs is guided by the 1969 Vienna Convention on the Law of Treaties (University of Joensuu *et. al.*, 2007).

There are over 500 MEAs worldwide, of which 320 are regionally based (*ibid*). Majority (60%) of the MEAs were adopted after the UNCHE in 1972. The global and regional MEAs to which Kenya is a signatory are categorized in five clusters based on the UNEP framework of International Environmental Governance, namely a) atmosphere; b) chemicals and hazardous waste; c) land; d) seas; and e) biodiversity (UNEP, 2001; 2007) (Figure 1-1). This research was centred on the MEAs in the biodiversity cluster. The MEAs have played a significant role in developing countries by enabling them to improve the environmental quality by implementing national policies (UNEP, 2007).



Figure 2- 1: UNEP framework of International Environmental Governance

Source: UNEP, 2001

Kenya is a signatory to a total of ten (10) MEAs all of which are ratified (GEF & UNDP, 2007). The country's goal is to improve its MEAs' implementation capacity, which is eventually expected to boost national economic growth and eradicate poverty while contributing towards the country's and global ecosystem integrity. However, despite this effort the state of biodiversity in the country has continued to deteriorate. The general aim of this study was to establish whether or not the problem is associated with the approach which Kenya has adopted in the domestication and application of the biodiversity MEAs.

1.2 STATEMENT OF THE RESEARCH PROBLEM

The focus of this research was on Kenyan ecosystems because Kenya is considered a mega biodiversity rich country with a wide range of ecosystems and species (Manek, 2001). To safeguard this valued biodiversity, Kenya has signed many global and regional MEAs (*ibid*). At the national level, attempts are being made to domesticate the MEAs through a wide range of measures such as National Biodiversity Strategy Action Plans (NBSAPs), National Environmental Action Plans (NEAPs) and a wide range of policy and legal frameworks including the Draft Environment Policy (Government of Kenya [GoK], 2013a), Environmental Management and Coordination Act (EMCA) (GoK, 1999a) and Wildlife Conservation and Management Act (GoK, 2013b). In spite the fact that Kenya has many biodiversity related policies and legislations; its biodiversity is declining with 325 species of flora and fauna facing vulnerability (Weru, 2016).

Research undertaken by the Kenya Wildlife Service (KWS) on a nationwide level, for example, shows a dramatic decline in the lion (*Panthera leo*) population from 2,749 in 2002 to 2,280 in 2004 (KWS, 2008a). This is attributed to declining habitat (National Environment Management Authority [NEMA], 2011). The same is the case for elephants (*Loxodonta Africana*) whose population was 167,000 in 1973 (NEMA, 2011) and reduced to just 32,500 in 2016 due to high levels of poaching (Weru, 2016).

The natural ecosystems which contain plenty of biodiversity in the country are facing a wide range of environmental challenges in spite of having various policies and legal frameworks geared towards biodiversity protection. Research done by Norton-Griffiths (1998) indicates that from 1977 to 1998, the country has lost 44% of its wildlife in spite of having various national biodiversity policies and frameworks. For example, Mt. Kenya ecosystem has continued to face problems like forest fires, poaching and deforestation leading to biodiversity loss (KWS, 2012). Another terrestrial ecosystem with similar problems is the Maasai Mara National Reserve (MMNR). According to Ogutu *et. al.* (2011), many wildlife species in the MMNR have declined over the years due to loss of natural habitat. These include the giraffe (*Giraffa camelopardalis*) population, which has declined from 27,000 to less than 500 between 1975 and 2010; the ostrich (*Struthio camelus masaaicus*) from over 1,000 to slightly more than 200 and the African elephant from 15,000 in 1976 to less than 800 animals.

According to Norton-Griffiths (1998), if the country's biodiversity keeps on declining, it will be a major blow for the tourism sector which is the country's second largest earner after agriculture. His research indicates that the country's tourist numbers are already declining due to a fall in biodiversity. He has cited examples of area where this is happening. For example from 1977 to 1994, the wildlife numbers in Narok County have fallen by 65%. The same is the case in Samburu where the numbers have declined by 33%. This trend indicates that not only will the country suffer in terms of revenue, but it will be a major blow to the communities, which through the Communities Wildlife Service Programme of the KWS have been earning revenue by enjoying the benefits of wildlife.

This problem is not only restricted to terrestrial ecosystems but also to aquatic environments. Lake Naivasha, a Ramsar site, has been facing serious environmental challenges. In 2008 the site was

almost transferred to the Montreux Record of threatened sites due to ecosystem degradation (Peck, 2008). Putting the site under the Montreux Record would have indicated that Kenya, as a signatory to the Ramsar Convention was not doing well in protecting the ecosystem. This raises serious questions on the formulation and implementation of good policies in conservation of biodiversity (Department for International Development [DFID], 2002; World Resource Institute [WRI] *et. al.*, 2005; Irwin & Ranganathan, 2007).

This study was consequently based on the following research questions regarding the domestication and implementation of biodiversity MEAs in Kenya:-

1. Has the country, after ratifying the MEAs, ensured that they are properly embraced in national policies for effective governance of the biodiversity sector?
2. Are the MEAs well catered for in the various focal institutions associated with biodiversity management in the country?
3. Do the local people know about the biodiversity MEAs which Kenya has ratified and whose implementation they are also expected to contribute?
4. What are the key achievements, threats and challenges in the implementation of MEAs at site level around the country?

1.3 RESEARCH OBJECTIVES

The study objectives were:-

1. To assess the integration of biodiversity MEAs at national policy levels in Kenya.
2. To assess the integration of biodiversity MEAs in the various focal institutions associated with biodiversity management in the country
3. To determine the level of community awareness of biodiversity MEAs within the conservation and operational sites in Kenya.
4. To evaluate the key achievements, threats and challenges facing the domestication and implementation of biodiversity MEAs in Kenya and suggest solutions.

1.4 RESEARCH HYPOTHESES

The following null hypotheses were tested in this study:-

1. MEAs are poorly reflected in national biodiversity policies at institutional levels;
2. There is no difference between the local people's MEA awareness with the distance from the conservation and operational areas;
3. There is no difference in the typology of threats affecting the domestication and application of various biodiversity MEAs in Kenya.

1.5 SIGNIFICANCE AND JUSTIFICATION OF THE STUDY

Worldwide there is a major problem of biodiversity conservation. The reasons vary from lack of political will, resistance from communities to government approaches in conservation. This study attempted to fill the gap of inadequate policies and weak implementation of policies. At the same time some countries also have financial challenges leading to a problem of MEA implementation. This study was aimed at finding out if Kenya also had a similar problem and if this was the case, how the country would be able to come up with a better implementation strategy.

The Kenyan Government has taken good initiatives to implement various biodiversity MEAs at national level as part of its international obligation. Consequently, the country has approximately 8% of its land and water under biodiversity protection (KWS, 2014b). This is substantial when compared with other countries such as South Africa (6.1%), Mauritius (3.3%) and India (5.3%) but inferior when compared to its East African counterparts of Tanzania (39.6%) (WRI, 2005), Uganda (16.9%) (NEMA, 2009) and the rest of the developing countries like Zambia (41.4%), Botswana (30.2%), Malaysia (30.5%), Venezuela (34.2%), Colombia (72.3%) (WRI, 2005) and Costa Rica (26%) (UNDP, 2010). This study aimed at elaborating whether the protected areas (PAs) are just put in place to "show off" that Kenya is good at setting them up or whether they effectively reflect the outcomes of governance through policies, the strength of the focal institutions and the successful involvement of local communities around them. The study motivates one to understand the importance of MEA sites like wetlands which in many cases are looked upon as wasted environments that should be reclaimed.

This study provides a useful database to assist researchers, policy makers and stakeholders in the biodiversity sub-sector on the way forward towards the successful domestication and implementation of MEAs. The topic is very important to the success of safeguarding biodiversity in a sustainable manner. The study evaluates Kenya's commitment in conserving its rich biodiversity through governance, focal institutions and stakeholders' involvement especially the local communities around protected and designated sites.

This study also fits very well in the mandate of UNEP's Division of Environmental Policy Development whose objective is to help countries formulate policies for the success of environmental wellbeing, which includes safeguarding of biodiversity through policy making and also having the policies implemented effectively in order to achieve the global biodiversity targets. The study also fits very well with the mandate of the African Ministerial Conference on the Environment (AMCEN) which is in-charge of monitoring environmental management in Africa. It provides a framework for reporting at the national and sub-regional levels. Through the Africa Environment Outlook which is a tool of the AMCEN, member states develop environmental policies including those for biodiversity management for the sustainable future of the continent (UNEP, 2013).

Furthermore, the study was found to be very ideal towards assisting the country achieve the Strategic Plan for Biodiversity 2011-2020. This is because the study focused on all the goals of the strategic plan namely Goal A on addressing the underlying causes of biodiversity loss by mainstreaming biodiversity across governments and societies; Goal B on reducing threats on biodiversity and promoting sustainable use; Goal C on improving the status of biodiversity by safeguarding ecosystems, species and genetic diversity; Goal D on enhancing benefits to all from biodiversity and ecosystem services and Goal E on enhancing implementation through participatory planning, knowledge management and capacity building.

The study was worth investigating so as to show the successes behind the formulation and implementation of biodiversity policies in Kenya. It was also geared to determine the level of community awareness and involvement of institutions in encouraging communities to conserve biodiversity. Hence, the study fits in well with public involvement in the implementation of biodiversity MEAs.

1.6 SCOPE AND LIMITATIONS

The research considered the following MEAs: (a) Convention on Biological Diversity (CBD), Convention on International Trade in Endangered Species of Plants and Animals (CITES), (c) Convention on Conservation of Migratory Species of Wild Animals (CMS), (d) Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) and, (e) World Heritage Convention (WHC), all of which Kenya is a party to. The research was focused on biodiversity-related policies based on the the general norm that such policies should be informed by the MEAs and thereafter will inform the legal frameworks for sustainable biodiversity management. The research focused mainly on the designated biodiversity management institutions mandated to implement the MEAs in Kenya. The Ministry of Environment, Water and Natural Resources (MEWNR) (formerly the Ministry of Environment and Mineral Resources [MEMR]) is the focal institution for the CBD; the KWS is the focal institution for the CITES, CMS and the Ramsar Convention while the National Museums of Kenya (NMK) is the focal institution for the WHC. This research also considered designated lead agencies whose mandate is associated with biodiversity management including the Kenya Forest Service (KFS).

The scope of the study also included selected MEA designated and tentatively listed sites and the points of entry and exit into the country. Lake Nakuru in the Rift Valley region and Arabuko Sokoke Forest in the coastal region were used as CBD case study sites. The study sites for CITES were Jomo Kenyatta International Airport (JKIA) in Nairobi, Namanga town at the Kenya-Tanzania border and the Port of Mombasa in the coastal region. Lake Bogoria and the MMNR in the Rift Valley region were used as case studies for CMS. For Ramsar Convention the case studies were lakes Naivasha, Bogoria and Nakuru, which are all located in the Rift Valley region. Lake Naivasha was a very important case study because in 2008 it was almost listed under the Montreux record of blacklisting Ramsar sites. For the WHC, the sites were the MMNR in the Rift Valley region and Mt. Kenya National Park in Central Kenya. MMNR though as yet not under the WHC, has already been proposed by the Kenya government to be included as part of the world heritage sites in the country. In these study sites, the emphasis was on communities living around the lake shores and their catchment, national parks and reserves and border points.

In terms of limitations, language was a major barrier during the fieldwork, especially around Arabuko Sokoke Forest where the indigenous Watta community did not speak English so the

questionnaires had to be translated to the Swahili language. Time was also a limitation as this research had to be completed within a stipulated time frame because sites were dispersed.

1.7 DEFINITIONS OF OPERATIONAL TERMS

1. **Adoption:** When a country which has signed an international agreement decides to incorporate the agreement into its domestic legal system.
2. **Biodiversity:** The variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part and this includes diversity within species, between species and of ecosystems (UNCED, 1992).
3. **Catchment:** The surrounding areas of a MEA conservation and operational (designated) site.
4. **Communities:** People staying around the catchments of PAs and conservation and operational sites.
5. **Conference of Parties (CoPs):** It is a policy making body which meets annually/bi-annually to look at the success of implementing of an agreement and then make changes and adapts to decisions and agreements for the future implementation of the agreement.
6. **Conservation sites:** Sites which were selected as case studies for this study.
7. **Ecosystem:** A dynamic complex of plant, animal and micro-organism communities and the non living environment where there is interaction (UNCED, 1992).
8. **Implementation:** When a country which has ratified and adopted an agreement decides to bring the agreement to its country's policies and legislations so as to meet the requirements of the agreement.
9. **MEA site institutions:** Offices which manage the conservation sites. They include site offices within the catchments of the conservation sites.
10. **MEA ratification:** When an international agreement is signed by a government official and the State is bound to follow its provisions.
11. **MEA signing:** When a country begins the process of endorsing a treaty, convention or protocol.
12. **Multilateral Environmental Agreement:** An international law that is legally binding and which could be a treaty, convention or protocol.
13. **National focal institutions:** Institutions in-charge of relevant MEAs, also known as national headquarters or lead institutions.

CHAPTER TWO

LITERATURE REVIEW

2.0 INTRODUCTION

The literature review considers the ways in which MEAs are developed, the institutions involved, their importance and management, the formation and implementation of national biodiversity policies and frameworks and their implementation weaknesses. It gives an overview of various country-based studies and highlights their successes and failures. The focus of this literature review has been on the Afro-tropical biogeographic region. This is because Kenya is in the Afro-tropical region and similar comparisons to Kenya have been found to be of more value due to similar biodiversity characteristics.

2.1 BIODIVERSITY

Africa is home to many of the world's known and catalogued biodiversity (Fjeldsa & Burgess, 2008). It has more than 50,000 plants, over 1,000 mammals and 1,500 birds' species (Mittermeier *et. al.*, 1999; 2000; Myers *et. al.*, 2000; UNEP, 2013; UNEP, 2016). East Africa has the highest numbers of endemic species including 55% of mammals, 49% of reptiles and 40% of amphibians in the continent (Global Biodiversity Forum [GBF], 2004). Beyond the species heritage, Africa has a total of eight (8) world biodiversity hotspots which include the Cape Floristic Province and Karoo ecosystems in Southern Africa and the Central African tropical rain forest. Eastern Africa, including Kenya, contains five of the eight biodiversity hotspots in Africa namely a) the West Indian Ocean Islands, b) the coastal forests of eastern Africa which includes the Eastern Arc forests, c) the Guinean Forests of Africa such as the Kakamega Forest, d) the Eastern Afromontane ecosystems comprising of forests such as Mt. Kenya and Mt. Elgon and, e) the Horn of Africa rangelands including the Somali-Maasai region.

Despite this wealth in natural heritage, statistics show that for terrestrial areas in Kenya, the wildlife population has declined rapidly by up to 41% from the 1970s (Western *et. al.*, 2009). For example the elephant population declined from 167,000 to 24,000 between 1973 and 1999 (Thouless *et. al.*, 2008) while the black rhino (*Dinecosus bicornis*) reduced from 20,000 to 350 between 1970 and 1986 due to poaching as well as habitat destruction (KWS, 2012). For other species like the wildebeests (*Connochetes taurinus*), the decline in areas like the MMNR was as high as 81%

(Ottichilo *et. al.*, 2001; Bolger *et. al.*, 2008). The trend is quite similar in the aquatic coastal areas where fish stocks are overharvested by fishing fleets (Stein *et. al.*, 2000; Smith & Darwall, 2006; Kurvits *et. al.*, 2011; Secretariat of the CBD, 2014).

Studies by the Organization for Economic Co-operation and Development (OECD) (OECD, 2008) and Kurvits *et. al.* (2011) as well as a report by the UNEP (UNEP, 2013) show that biodiversity loss will continue in future especially in Africa due to land use changes like increase in agriculture. Therefore there is the need to have biodiversity conventions which can be implemented in countries through legislations so that biodiversity numbers can increase or remain static.

2.2 MULTILATERAL ENVIRONMENTAL AGREEMENTS

Since the beginning of human life on Planet Earth, ancient people understood that unless they live in accordance and with due respect to the natural laws, they would not survive. They therefore respected the instructions given by the creator on life giving elements namely air, water, fire (energy) and earth and taught respect for oneness and interdependence of all life. This was basically possible because human population was low and it was believed that natural resources were in abundance. This belief led to continents like Europe and countries like Greece to degrade their entire ecosystems resulting in the need to have MEAs in place.

Biodiversity MEAs emerged in the 1900s with the London Convention for Protection of Wild Animals, Birds and Fish in Africa (1900) as the first of its kind, followed by the Convention on the Preservation of Fauna and Flora in their Natural State (1933). However MEAs have become more prominent since the 1960s and 1970s because of increased biodiversity loss and environmental awareness. The proliferation was also attributed to the establishment of UNEP in 1972. The MEA journey is closely associated with the 1972 UNCHE in Stockholm (Schroeder & Pisupati, 2010) followed by the UN Conference on Environment and Development (UNCED) also known as the Rio Summit in Rio de Janeiro in 1992 – twenty years after the Stockholm Conference.

2.3 BIODIVERSITY MULTILATERAL ENVIRONMENTAL AGREEMENTS

Wildlife treaties are amongst the oldest examples of international laws. The first kind of wildlife convention in Africa was the Convention on Preservation of Flora and Fauna in their Natural State

which was developed in 1933 (Neumann, 1998). This Convention spearheaded the process of declaring areas under protection status (Harmon & Putney, 2003). The role of PAs has gained importance since the Bali World Parks Congress (WPC) of 1982 and the 1992 UNCED. The WPC emphasised that the world should have at least 10% of the land under the PAs status for *in-situ* protection (Miller, 1984). By 2014, PAs covered 14% of the world's terrestrial areas and 3.41% of the world's marine areas (Deguignet *et. al.*, 2014). The strength of biodiversity conventions can thus be measured according to one of their objectives to designate protected areas. By 1970 there were only a handful of parks but in 1990 the coverage of PAs worldwide was 3 million km²; in 2004 they were over 20 million km² (Chape *et. al.*, 2005; Kothari & Pathak, 2006; Swiderska *et. al.*, 2008) and over 32 million km² in 2014 (UNEP-World Conservation and Monitoring Commission [WCMC], 2014).

The 2002 WSSD in Johannesburg (South Africa) reinforced the importance of biodiversity in achieving sustainable development as evidenced by the adoption of the Water, Energy, Health, Agriculture and Biodiversity (WEHAB) framework which identified biodiversity as a priority in the water, energy, health and agriculture sectors. This framework requires that biodiversity-related issues be integrated in the development agenda as a key life supporting asset (Wynberg, 2002). The WEHAB Working Group shows that 40% of the global economy is based on biological goods and services (UN, 2002). However, this benefit may be at stake with the rapid decline in world biodiversity. Consequently, the need for biodiversity-related MEAs in the world has become necessary. These are in two categories, namely ecosystem-based MEAs and species-based MEAs. The CBD, Ramsar Convention and WHC are ecosystem-based MEAs while the CITES and CMS are species-based.

2.3.1 Ecosystem-based Multilateral Environmental Agreements

The CBD, the Ramsar Convention and the WHC are key international frameworks whose aim is to protect the valued ecosystems of the world with critical natural heritage. The CBD was opened for signature in 1992 and came into enforcement in 1994. This Convention has been one of the most remarkable, with record signing by 158 heads of states during the Rio Summit in 1992. By October 2015 there were 196 State Parties to the Convention, whose secretariat is in Montreal, Canada. The CBD is also known as the “Omnibus Convention” or the “Convention for all life on the Earth” and is regarded as the over-arching biodiversity convention which deals with many critical issues

including access and benefit sharing (McGraw, 2002). The Convention considers biodiversity issues comprehensively and from many cross-cutting angles such as sustainable use, equitable benefit sharing and biodiversity conservation through *in-situ* and *ex-situ* conservation (Manek, 2001; McGraw, 2002). The Convention adopts the ecosystem approach, which is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable manner (Likens, 1992). Kenya signed the CBD on 11th June 1992 and ratified it on 26th July 1994.

Before the CBD, there were a number of MEAs which tried to protect biodiversity from several angles. The first of this kind was the Ramsar Convention, which was adopted on 2nd February 1971 in the Ramsar City of the Islamic Republic of Iran and came into force on 21st December 1975. Its secretariat is based in Gland, Switzerland. By October 2015 there were 169 parties to the Convention. The objective of this Convention is to protect important habitats of water birds by controlling the encroachment and loss of wetlands and ensuring their wise use. Kenya signed the Ramsar Convention on 5th October 1990 and ratified it on 5th June 1991. The country's first designated Ramsar site was Lake Nakuru in 1990, followed by Lake Naivasha in 1995, Lake Bogoria in 2001, Lake Baringo in 2002, Lake Elementaita in 2005 and the Tana River in 2012 (GoK, 2015).

The WHC on the other hand was adopted on 16th November 1972 in Paris, France and came into effect on 17th December 1975. Its secretariat is in Paris, France. Its objective is to establish an effective system of collective protection of the cultural, historical and natural heritage of outstanding universal value. By October 2015 there were 191 parties to the Convention. Kenya signed the WHC on 5th June 1991. Currently Kenya has six sites under the WHC. The first designated site was Mt. Kenya in 1997, based on the mountain's natural heritage value; Lake Turkana National Park was designated in 1997 due to its historical, cultural and natural heritage value; Lamu Town in 2005 due to its historical and cultural value; the Miji Kenda Kaya Forests based on natural and cultural heritage in 2008; Fort Jesus Museum and the Old City of Mombasa designated in 2011 due to their historical heritage and the Great Lakes Circuit of lakes Elementaita, Bogoria and Nakuru designated in 2011 due to their natural heritage. The MMNR is already on the tentative list

of WHC sites on the basis of natural heritage due to the migration of the wildebeests and zebras (Ayiemba *et. al.*, 2015).

2.3.2 Species-based Multilateral Environmental Agreements

The CITES and the CMS are the key species-based MEAs in the world. The CITES was adopted in Washington DC., USA on 3rd March 1973 and came into effect on 1st July 1975 and was further amended in Bonn in 1979 and in Gaborone in 1983 with the aim of protecting endangered species listed in the International Union for Conservation of Nature (IUCN) Red List from over-exploitation by use of import-export permits. The Convention secretariat is based in Geneva, Switzerland. By October 2015 there were 181 parties to the Convention. CITES has been further strengthened in Africa by the Lusaka Agreement of 1992 where the African countries agreed to collaborate with each other to protect wildlife. Kenya ratified CITES in 1978.

The CMS, also known as the Bonn Convention, was adopted in Bonn, Germany on 23rd June 1979 and came into effect on 1st November 1983. This MEA was set up to protect wild animals that migrate across national and trans-national boundaries, including migratory land and sea animals. The aim of the Convention is to ensure that the traditional migration of wildlife through different regions of the world is sustained through international collaboration. Its secretariat is based in Bonn, Germany. By October 2015 there were 118 parties to the Convention. Kenya adopted the CMS on 1st May 1999.

2.4 SUSTAINABLE BIODIVERSITY MANAGEMENT

In most countries, the State is the main actor in national biodiversity governance. Individual governments are therefore responsible for ratifying and adopting relevant biodiversity MEAs based on their national situations and also for ensuring effective domestication and application of the adopted MEAs. In this area, the State works very closely with other actors, including international environmental organisations like the UNEP, UNESCO, UNDP, Global Environmental Facility (GEF) and the MEA secretariats. International organisations like the World Bank and the International Monetary Fund are also important stakeholders in biodiversity management as they are the key funding agencies for these MEAs. One of the key ways which governments are expected to ensure the adoption, domestication and application of biodiversity MEAs is by incorporating them in national policies, legal frameworks and strategic development plans. Countries are also expected

to continuously embrace MEA activities in national development and environmental management programmes and projects through action plans, work programmes and other prescriptions as directed in the MEA CoPs.

2.5 GLOBAL OUTLOOK ON FORMULATION AND IMPLEMENTATION OF BIODIVERSITY RELATED POLICIES, LEGAL FRAMEWORKS AND STRATEGIC PLANS

Following the decrease of biodiversity worldwide, it has become very important for countries to start taking the right steps towards sustainable conservation of this asset for the sake of the current and future generations. The first step for countries is to inventorize and assess their biodiversity and bioresources, identify causes of biodiversity loss and look into solutions. The countries should then set goals for inclusion in national policies and environmental laws as per the country's vision. In order to have strong biodiversity governance, the countries must establish national and regional biodiversity management institutions, secretariats and focal points as institutional platforms to engage in public participation and decision making. The formulation of legislations in a country is usually done by concerned ministries who then forward them to the respective parliaments for adoption. Thereafter, the policies are implemented and enforced through various legal frameworks by the institutions mandated to do this. In order to see the success of the policies and legal frameworks, their harmonization is very essential (Mohamed-Katerere, 2001; UNEP, 2013).

2.5.1 Worldwide scenario

Countries have approached biodiversity policy formulation in different ways. Costa Rica is one of the best model nations in terms of well developed policies and proper implementation worldwide. The country has been able to achieve all biodiversity MEAs' obligations by having adequate legislations to address them. In order to administer biodiversity laws, it has set up the National System of Conservation Areas which is managed by the National Biodiversity Administration Committee (CONAGEBIO). CONAGEBIO is a national independent commission which oversees, coordinates and formulates policies on biodiversity issues with the relevant institutions. The country's focal point of implementing biodiversity MEAs is the Ministry of Environment, Energy and Telecommunications (Centre for International Sustainable Development Law [CISDL] & World Future Council [WFC], 2011). Some of its policies and legislations in the country include the Wildlife Protected Area Policy, Co-management of Wildlife Protected Areas Policy, Wetland Policy,

Biodiversity Law, Wildlife Conservation Law and the Prohibition of trade in dolphins and killer whales (*ibid*).

2.5.2 Scenario in the African continent

Several countries in Africa have attempted to integrate biodiversity MEAs in national policies and legislations. South Africa which has a very rich biodiversity heritage with many endemic species has established the MEAs coordinating focal point at the Department of Environmental Affairs and Tourism (DEAT) (Spenceley, 2001). The country's national parks are protected by the South Africa National Parks Board (SANPB) and the forest reserves by the National Botanical Institute. The scientific body in-charge of research and monitoring biodiversity is the South African National Biodiversity Institute (SANBI), established under the National Environmental Management Biodiversity Act (NEMBA) (DEAT, 2004) which is the mother of all biodiversity legislations in South Africa (DEAT, 2009). This is similar to Kenya's National Environment Management Authority (NEMA) formed under EMCA (GoK, 1999a). While the implementation of the CBD, CITES, CMS and WHC in South Africa is done by the DEAT, the Ramsar Convention is implemented by the Department of Water Affairs and Forestry (DWAF) (Geach, 1999).

The Constitution of the Republic of South Africa (RoSA) (RoSA, 1996) is the mother of all policies. It states that all South Africans have a right to a healthy environment and must protect the environment for sustainable development through legislations. Under this constitution the National Government has exclusive rights over water and minerals while in the case of the environment, forests, natural conservation, marine and agricultural resources, the rights lie with the national and provincial governments (RoSA, 1996; Brownlie & Wynberg, 2001).

Based on the country's constitution and the CBD obligations, the White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity was developed in 1997 (DEAT, 1997). The White Paper has six goals which are to conserve the ecosystems' diversity, habitats, population, species and genes by using them sustainably with minimal impact on the environment; the benefits derived from using genetic resources must serve national interests; build capacity for biodiversity conservation; find solutions for forest protection; create incentives for sustainable use of biodiversity and promote conservation and sustainable use of biodiversity at international levels. Thus, the White Paper is both a policy and strategy (DEAT, 1997; 2009).

South Africa developed its NBSAP in 2006 and has good strategies for biodiversity conservation and sustainable use. The NBSAP is based on the ecosystem approach where communities are included in conservation and management of PAs through revenue sharing, decision making, education and awareness of biodiversity (Southern African Development Community [SADC], 2006). Besides the policies, the country also has legal frameworks. The NEMBA (DEAT, 2004) has got its basis from the framework of the National Environmental Management Act (1998) (DEAT, 1998c) and is aimed at providing national protection to all ecosystems by eliminating biodiversity threats, encouraging wise use of indigenous biological resources and equitable sharing of benefits from bio-prospecting. It has very clear provisions on protecting critical ecosystems and threatened species and special guidelines on *in-situ* and *ex-situ* protection. The Act spells out strict compliance levels in provision with CITES where all trade in biodiversity must be conducted in consultation with the scientific body, the SANBI. The issue of alien species is also critically dealt with. It specifies how environmental impact assessments (EIAs) of invasive species should be done through continuous research, monitoring and listing of these species (DEAT, 2009).

The forests of South Africa are protected through the Forest Act (DEAT, 1998a). The Forest Act (DEAT, 1998a) was enacted with the aim of ensuring sustainable use of forests for economic, social and environmental benefits so as to conserve biodiversity, ecosystems and habitats. The Wetlands Conservation Act (DEAT, 2003) which has provided a mechanism for regulating activities and development on wetlands is aimed at changing the ecological nature and functioning of wetlands, especially the ones considered to be of international importance. It prohibits mining and deforestation in the wetlands, including their catchments. Under this Act, the wetlands have many stakeholders including the DWAF, SANPB, provincial authorities and private land owners (DEAT, 2009). Similarly, marine life and the biodiversity of coastal ecosystems are protected through habitat conservation under the Marine Living Resources Act (DEAT, 1998b).

While Eastern and Southern Africa's conservation strategies are more focused towards wildlife as they have a high hub for this, West Africa's scenario is focused towards forests as the continent's largest share of forests lies in this region. Cameroon, for example is one of the richest countries in Africa ranking fourth in floral richness and fifth in fauna diversity. In Cameroon, the constitution (Republic of Cameroon [RoC], 1996a) is the mother of all policies and provides fundamental basis for protecting the environment. It emphasises that ecosystems must remain healthy and that it is

the conservation priority of the country. The constitution has allowed international laws to be incorporated into national laws.

Cameroon developed the first NBSAP in 1999, which came into effect in 2000 (RoC, 1999). The NBSAP was based on the ecosystem approach and it highlighted that all policies be based on sustainable exploitation of biodiversity so as to reduce vulnerability of ecosystems, strengthen capacity building for their management, promote traditional knowledge on the use and value of biodiversity, reduce threats and promote biodiversity prospects. The first NBSAP was revalidated after ten years and at present there is the 2012 NBSAP II which is a revision and update of the 2000 NBSAP (RoC, 2012). NBSAP II is based on Cameroon's Vision 2035. The Vision's goal is to ensure sustainable biodiversity use and benefits leading to the wellbeing of the people and effective community participation (Sandbrook & Roe, 2010). In order to achieve the targets of the NBSAP, legislations on fisheries, livestock, forestry, wildlife and agriculture sectors have been developed. These are supported by a number of legal frameworks such as the Wildlife Act (RoC, 1994b), Fisheries Act (RoC, 1994a) and Environment Act (RoC, 1996b). These frameworks are implemented by the Ministries of Environment, Protection of Nature and Sustainable Development (MINEPDED); Forestry and Wildlife; Livestock, Fisheries and Animal Industries; Agriculture and Rural Development; and Culture.

Ghana is also very rich in biodiversity. The country has 16% of its terrestrial area under PA status (Tutu *et. al.*, 1993; Republic of Ghana [RoG], 2002). Its constitution (RoG, 1992) is the mother of all policies and provides the basis for environmental protection. Under the constitution's economic objectives, it emphasises that the environment must be safeguarded for prosperity and human survival. The constitution has also catered for the integration of international laws at national level. Ghana developed and implemented its first NBSAP in 2002 (RoG, 2002). The NBSAP is aimed at integrating biodiversity issues in national development agendas by building capacity to assess biological resources, involve communities in sustainable management of bioresources and protect biodiversity in PAs. This NBSAP is based on the country's national programme for economic and social development (2003-2012) which aims at utilizing natural resources sustainably (RoG, 2002). The target of achieving the Ghana NBSAP is to develop relevant policies and legal frameworks whose implementation of these legislations is undertaken by the Ministries of Local Government,

Rural Development and Environment; Lands and Natural Resources; Food and Agriculture; and Fisheries.

2.5.3 Scenario in the East African countries

Eastern Africa is a biological powerhouse with five international biodiversity hotspots in the region. This means that the countries in the region must work hard to ensure proper governance and management of the biological heritage on behalf of the whole world. Table 2-1 shows wildlife trends in Uganda, Tanzania and Kenya.

Table 2- 1: Wildlife trends in Uganda, Tanzania and Kenya

Country	Species	Population trend				Source
		Year	Population	Year	Population	
Uganda	Elephant	1991	500	2007	3,000	Eilu <i>et. al.</i> (2008)
	Impala	1999	1,600	2009	35,000	www.uwa.org/wildlife-trends - accessed on 15 th November 2014.
	Rothschild giraffe	2003	240	2006	259	Eilu <i>et. al.</i> (2008)
	Zebra	1960	10,000	2012	11,814	www.uwa.org/wildlife-trends - accessed on 15 th November 2014.
	Topi	1990	400	2007	1,600	Eilu <i>et. al.</i> (2008)
Tanzania	Elephant	2006	142,788	2009	109,022	Miller (2011)
	Grevy's zebra	1996	296,508	2010	200,000	Miller (2011)
	Lion	2000	18,200	2010	16,830	Mésochina <i>et. al.</i> (2010)
Kenya	Grevy's zebra	2004	2,000	2010	2,300	NEMA (2011)
	Wild dog	1997	350	2007	800	Woodroffe <i>et. al.</i> (2004); KWS (2008b)
	Elephant	1973	167,000	2016	32,500	Weru (2016)
	Black rhino	1987	375	2010	635	NEMA (2011)
	Lion	2002	2,749	2011	1,970	Chardonnet (2002); Mésochina <i>et. al.</i> (2010)

Uganda also has plenty of biodiversity because it is located in an area where seven of Africa's distinct bio-geographic regions converge. It has more than 18,783 species of fauna and flora with thirty (30) endemic plant species and more than half of Africa's bird species (NEMA, 2002; Eilu *et. al.*, 2008). Furthermore, it has the second highest number of mammalian species in Africa after the DRC (Eilu *et. al.*, 2008). Though most of the country's biodiversity is found on terrestrial ecosystems, 13% occurs in aquatic ecosystems (NEMA, 2009). Despite this, Uganda has been experiencing biodiversity loss at 1% per annum due to threats like rapid human population growth, poaching, invasive species, climate change, deforestation, draining of wetlands and conversion of biodiversity rich lands into agriculture. To protect the existing biodiversity, Uganda has signed several biodiversity MEAs and has been working towards their integration in policies, legal

frameworks, strategies and plans (NEMA, 2009). The country ratified the CBD in 1993, one year before Kenya and also developed the first NBSAP in 2002 which came into enforcement in 2004 (*ibid*). Some of the national biodiversity policies in Uganda are the Constitution of Uganda (Republic of Uganda [RoU], 1995b), National Environment Management Policy (RoU 1994a), Wetlands Policy (RoU, 1994b), Wildlife Policy (RoU, 1996b), Forest Policy (RoU, 2001) and the National Policy on Biotechnology and Biosafety (RoU, 2008).

Under the Constitution of Uganda, environment and natural resources are given special recognition. Article 237(2) states that laws should be made authorising the central and local governments to hold natural resources in trust for people and protect ecosystems (RoU, 1995b). The country's National Environment Management Policy (RoU, 1994a) dwells on biodiversity conservation and management for socio-economic development and sustainability through community involvement in managing PAs and benefit sharing.

Uganda's Wildlife Policy (RoU, 1996b) emphasises on having PAs and listing all critical ecosystems, endangered and threatened species. The policy stresses the need to develop plans to protect ecosystems and PAs from serious threats. It emphasises on community involvement in decision making and ecotourism development (UWA, 2009). The country's Forestry Policy (RoU, 2001) reinforces the FAO requirement of 10% forest cover. In 1890, Uganda's forest cover was 53% (FAO, 1997; 2001) but by 1996 it reduced to 20% and by 2005 it shrank to 14% (National Forest Authority [NFA], 2008). The average rate of deforestation from 1990 to 2005 was 1.8% (NEMA, 2009).

The Wetlands Policy (RoU, 1994b) emphasises the need for regular monitoring of wetland changes, prevention of invasive species and pollution through strategic EIAs. Its Fisheries Policy (RoU, 2000a) has also been enacted to prevent overexploitation of fish in wetlands. In addition to these policies, the National Policy on Biotechnology and Biosafety (RoU, 2008) was formulated to protect biotechnology development, prevent social and environmental problems and improve the quality of life. The policy emphasises human and biodiversity health risk assessments, and application of safe handling of biotechnology to humans and the environment. This has led to the establishment of a National Biosafety Committee which has ensured the development of

laboratories at the Crop Science Department in Makerere University. In addition, the National Agricultural Research Lab Institute has been fully equipped for testing of Genetically Modified Organisms and checking of diseases and pests for genetically modified plants (NEMA, 2009; UWA, 2009).

In addition to the policies, Uganda has enacted a number of legal frameworks in relation to biodiversity management. These include the Environment Act (RoU, 1995a), Wildlife Act (RoU, 1996a), Forestry and Tree Planting Act (RoU, 2003), Forest Act (RoU, 1964), Environment (EIA) Regulations (RoU, 2005) and the Environment (Riverbanks, Wetlands and Lakeshores Management) Regulations (RoU, 2000b). In order to implement these legislations, the country has four lead institutions – NEMA (Uganda), Uganda Wildlife Authority (UWA), NFA and the Wetlands Management Department (WMD). The role of NEMA is to coordinate the GEF supported projects and prepare the country's national environment related reports. Uganda's wildlife is managed by the UWA and the forests by NFA. Both the UWA and NFA are mandated to coordinate and implement the CBD, CITES, CMS and the WHC. The WMD, which coordinates and implements the Ramsar Convention, has put in place the national wetland information system with a complete inventory of the country's wetlands. It has also adopted a community wetlands management programme aimed at partnering with communities to conserve wetlands (NEMA, 2009).

Uganda is also encouraging increased involvement of private sectors and NGOs including the World Wildlife Fund (WWF), Environment Alert, IUCN, Advocates Coalition for Development and Environment and Uganda Wildlife Society. This is in line with the country's Environment Management Policy (RoU, 1994a) and the NEAP 1995-2000 (RoU & NEMA, 1995). The lead institutions together with the private sector and CBOs have tried to implement the policies and tangible success has been realized. For example, the elephant population which was only 550 in 1995 increased to 3,000 in 2004. Similarly, the buffalo (*Synceus caffer*) population increased by 61% from 7,000 in 1995 to 18,000 in 2004 while the chimpanzee population increased by 33% from 3,000 in 1997 to 4,950 in 2003 (UWA, 2009).

Like the rest of its East African counterparts, Tanzania also has rich biodiversity especially in the Eastern Arc Mountains which is part of the Coastal Forests of Eastern Africa biodiversity hotspot

(Bisanda, 2003). The country has at least 310 mammalian species which makes it the fourth richest in Africa. Moreover, the country has the highest number of primate species in East Africa which totals to twenty-seven (27) compared to Uganda with twenty-three (23), Kenya with nineteen (19), Rwanda with fifteen (15) and Burundi with thirteen (13) species (de Jong & Butynski, 2012). In terms of vegetation, the country has the highest known plant diversity in Africa totalling to 11,000 species (Mwalyosi & Sosovele, 2001).

Like the rest of East Africa, Tanzania has been trying to domesticate the biodiversity MEAs by setting up biodiversity-related policies, legal frameworks, strategies, programmes and projects through the country's focal points at the National Environment Management Council and the Environmental Division of the Vice President's office (Benjaminsen *et. al.*, 2013). Some of the policies and legal frameworks include the Environment Policy (United Republic of Tanzania [URT], 1997a), Fisheries Policy (URT, 1997b), Ngorongoro Conservation Ordinance and Wildlife Conservation Act (URT, 1974), Marine Parks and Reserves Act (URT, 1994), Plant Protection Act (URT, 1997c), Fisheries Act (URT, 2002a), Forest Act (URT, 2002b) and the Environment Management Act (URT, 2004). The country has also developed the NBSAP (URT, 1999), which is being coordinated by the Environment Division of the Vice President's office.

The Environment Policy (URT, 1997a) is coordinated by the Ministry of Environment and is geared towards; a) protection of biodiversity resources in a sustainable manner, b) continuous establishment of PAs, c) promotion of conservation outside core areas, d) equitable sharing of resources, e) linking environment and the economy and, f) promoting community participation in environmental action and the devolution of powers on biodiversity from the government to local communities. This policy has taken into consideration both *in-situ* and *ex-situ* conservation. *In-situ* conservation is done by protecting forests and wildlife through national parks and reserves. *Ex-situ* conservation is practised through the National Tree Seeds Programme, the setting up of the National Herbarium and the Gene Bank (Swiderska *et. al.*, 2008).

The Wildlife Policy (URT, 1998; 2007) is coordinated and implemented by the Tanzania National Parks Authority (TANAPA). It is aimed at protecting wildlife through *in-situ* conservation which includes not only national parks and reserves but also Wildlife Management Areas (WMA) which

are co-managed with the local communities. The WMA cater for the sustainable use, benefit sharing and the wellbeing of migratory corridors and dispersal areas (Benjaminsen *et. al.*, 2013). Unlike Kenya, the Wildlife Policy (URT, 1998) in Tanzania allowed tourism-based hunting until 2007 (Nelson *et. al.*, 2007; Leader-Williams *et. al.*, 2009) when this was revised (URT, 2007; Benjaminsen & Bryceson, 2012; Gardner, 2012; Benjaminsen *et. al.*, 2013). In 2008 the introduction of Wildlife Conservation Regulations (URT, 2008) introduced a requirement for tourism operations like game drives, hunting and photography on community lands to seek government permission. In 2009, the Wildlife Act (URT, 2009) gave the Wildlife Division more powers to manage key wildlife areas. In spite of all these measures, the biodiversity in the country is declining due to poaching and illegal wildlife trade. An example is of the elephants whose population has declined by 60% since 2009 (Nyalandu, 2015). The losses are greatly seen in the key elephant areas and include the ecosystems of Malagarasi-Muyovosi where the loss is at 81%, Ruaha-Rungwa (loss being at 76%) and Selous-Mikumi where the elephant loss was experienced at 66% (*ibid*).

The country's Marine Parks and Reserves Act (URT, 1994) is implemented under the Ministry of Natural Resources and Tourism which has the mandate to establish and ensure sustainable conservation of outstanding areas of marine ecological importance and involve communities in benefit sharing and management. This led to the creation of the first marine park in the country namely the Mafia Island Marine Park in 1995. This park is protected by the Ministry of Natural Resources and Tourism through community involvement and is amongst the largest protected parks in the Indian Ocean (Tobey & Torell, 2006). A management plan for the park was developed in 2000 with emphasis on conservation, sustainable resource use, community participation, developing ecotourism and engaging communities in monitoring and research (URT, 2000).

Rwanda has also made efforts towards the domestication of biodiversity MEAs. The country has five unique ecosystems with distinct species and habitats which it has been trying to protect especially after the 1994 genocide and in line with the Rwanda Vision 2020 (WRI, 2003). Rwanda adopted a new constitution in 2003 (Government of Rwanda [GoR], 2003b) and it is the mother of all policies and caters for the protection and sustainable management of the environment, use of natural resources and overall development of the country. The country has very solid policies on

biodiversity. The Environment Policy (GoR, 2003a) is based on the CBD objectives of equitable sharing and sustainable use and conservation of natural resources. This policy has taken into account the environmental history of the country and the threats to biodiversity. It emphasizes on joint partnerships with government institutions, private investors and communities so that all citizens, as stipulated in the constitution can enjoy the fruits of the natural resources namely water, forests, land, soils, wetlands and other elements of biodiversity (GoR, 2003a).

In 2006, the government established the Rwanda Environment Management Authority (REMA) as the focal point of all biodiversity MEAs (United States Agency for International Development [USAID], 2008). The successful establishment of REMA led to the formation of the National Forest Authority (NAFA) in 2007 which is in-charge of developing and implementing policies, strategies and plans for forest cultivation (*ibid*). By implementing the Forest Policy (GoR, 2004), the Rwanda Agroforestry Network whose mandate is to hold dialogue between national and provincial forestry stakeholders, was also established (USAID, 2008).

The Wildlife Policy (GoR, 2007) is focused on protecting wildlife and regulating hunting. It caters for *in-situ* conservation through the establishment of PAs in the country. Under this policy, the PAs are managed by the Rwandan Office of Tourism and National Parks, Ministry of Water and Lands, Ministry of Forestry (MIFOR), NGOs and private companies. The Forest Policy (GoR, 2004), coordinated by MIFOR established the Provincial Forest Commission to promote sustainable forestry and increase the country's forest cover to 30% (GEF, 2006).

A significant number of legislations have been developed to ensure the smooth implementation of national biodiversity policies. These include Biosafety Law (GoR, 2005), EIA Law (GoR, 2006) and Fisheries Act (GoR, 2008). The country formulated its NBSAP in 2003 (GoR & Ministry of Lands, Environment, Forestry and Mines [MINITERE], 2003). The Rwandan NBSAP has five goals which are to improve conservation of PAs and wetlands, sustainable use of biodiversity, maximizing biotechnology benefits, developing and strengthening legislations and equitable sharing of proceeds from the use of biological resources (GoR & MINITERE, 2003).

2.5.4 Kenyan scenario

Kenya has made efforts towards the implementation of global biodiversity frameworks both at regional and international levels. There is considerable political will to conserve national biodiversity, as attested by the government's commitment to fulfilling the provisions of the biodiversity related conventions, treaties and protocols.

Kenya's conservation and formulation of biodiversity legislations started during the colonial days. After independence, a lot of emphasis has been placed on biodiversity protection through the formulation of relevant policies, setting up of national environmental-based institutions, and designation of PAs (Kristjanson *et. al.*, 2002; Gichohi, 2003; Waithaka, 2012). Some of the key national policies include the National Constitution of Kenya (GoK, 2010), the National Wildlife Conservation and Management Policy (GoK, 2012f), Sessional Paper No. 6 on Environment and Development (GoK, 1999b), Draft Environment Policy (GoK, 2013a), Forest Policy (GoK, 2014), National Wetlands Conservation and Management Policy (GoK, 2015), Draft Integrated Coastal Zone Management (ICZM) Policy (GoK, 2007a) and the National Policy on Culture and Heritage (GoK, 2009c). It also has several legal frameworks on biodiversity which include EMCA (GoK, 1999a), Wildlife Conservation and Management Act (GoK, 2013b), Environmental Management and Co-ordination (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulations (GoK, 2009a), Forest Act (GoK, 2005b), Biosafety Act (GoK, 2012b), Fisheries Act (GoK, 2012d), the Environmental Management and Co-ordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations (GoK, 2006a) and the National Museums and Heritage Act (GoK, 2006b).

The Constitution of Kenya has taken into consideration the role of natural resources including biodiversity in the country. In line with the CBD obligation of equitable sharing, sustainable use and conservation, Article 69 of the constitution states that the government will ensure sustainable exploration, utilization, management and conservation of natural resources and equitable benefit sharing (GoK, 2010).

Sessional Paper No. 6 on Environment and Development of 1999 has been the main instrument behind safeguarding biodiversity in Kenya (GoK, 1999b). It aims at conserving biodiversity *in-situ*

and *ex-situ* in line with the CBD obligations. The paper has attempted to capture almost all CBD obligations and looks at all aspects of biodiversity. It focuses on developing biotechnology and biosafety, safeguarding natural resources from drought and desertification through early warning systems, regularly monitoring the status of these resources, undertaking EIA in projects and programs around PAs, eliminating threats to biodiversity and involving communities in conservation programmes, benefit sharing and decision making. This paper also emphasises the importance of developing biodiversity-related legislations.

The Wildlife Policy is a very important document which encourages the formulation of plans for PAs in Kenya (GoK, 2012f). It also has provision to set up additional PAs through community involvement and sharing of wildlife-related benefits. This policy has captured the protection of both terrestrial and aquatic biodiversity and taken into account the role of scientific research and indigenous knowledge in sustainable biodiversity management. Through this policy, the KWS is working with the Kenya National Examinations Council (KNEC) to make wildlife-related subjects examinable at primary and secondary levels.

One of the recent policies focusing on environmental issues is the Draft Environment Policy (GoK, 2013a). The policy has taken into account the prescriptions of the Constitution of Kenya (GoK, 2010) based on equitability, sustainability and the application of the CBD ecosystem approach. It looks at biodiversity issues by specifying what needs to be done in different ecosystems and emphasises the need for management plans.

The Forest Policy (2014) focuses entirely on sustainable forest utilization and conservation (GoK, 2014). This is to be done through community participation, public education and private sector involvement. The Wetlands Conservation and Management Policy focuses on protection of wetlands from conversion, invasive species and overutilization through public education and awareness, community involvement, use of indigenous knowledge and development of management plans and strategies (GoK, 2015). The National Land Policy emphasises the need for identifying critical terrestrial and aquatic ecosystems and developing management plans to protect them (GoK, 2009b) while the National Policy for the Sustainable Development of Northern Kenya

and Arid Lands has taken into account the role of indigenous knowledge and education so as to protect pastoralist societies who depend on biodiversity for survival (GoK, 2012e).

Kenya has also developed specific policies to safeguard aquatic biodiversity. The Oceans and Fisheries Policy (GoK, 2008) stresses the need for protecting fisheries including genetic resources, carrying out regular social and economic audits and cooperating with other states by conducting joint research. The Draft Fisheries Policy (2005) highlights the need for joint international cooperation in research and development (GoK, 2005a) while the Draft ICZM Policy emphasises on controlling marine pollution, developing an oil spill contingency plan through the use of scientific and indigenous knowledge and protection of endangered species (GoK, 2007a). This is in line with the requirements of the Secretariat of the East African Coastal Area Management (Hewawasam, 2000; Bode *et. al.*, 2008; DEAT, 2011).

The Tourism Policy (2007) was developed to safeguard the future of tourism as the second largest foreign exchange earner for the country, after agriculture (GoK, 2007b). This policy was formulated based on the fact that Kenya has one of the most developed wildlife-based tourism destinations in Sub-Saharan Africa (Sindiga, 1999). It has incorporated regional and international cooperation which includes transboundary initiatives between Kenya and Tanzania, as a joint hub of wildlife tourism. In the recent past, the Draft Natural Resources Development and Management Policy (GoK, 2012c) was formulated within the spirit of the CBD obligations. It emphasises the need for EIA to be undertaken before extracting resources; sharing resources equitably amongst communities, applying the ecosystem approach to conserve natural resources and providing education and awareness on biodiversity use. Finally, the National Policy for Disaster Management is also geared towards mainstreaming disaster management in biodiversity management (GoK, 2009d).

Like the national policies, Kenya has developed a wide range of legal frameworks to support the implementation of the former. The mother of all legal frameworks in Kenya is EMCA (GoK, 1999a). This document has tried to address all environmental issues within the country and most of the CBD obligations. For example, Article 8 on *in-situ* conservation, Article 9 on *ex-situ* conservation

and Article 15 on access to genetic resources of the CBD (UNEP, 2005b) are considered in Sections 51, 52 and 53 of EMCA (GoK, 1999a).

The previous Wildlife Coordination and Management Act (GoK, 1976b) which was aligned with the Wildlife Policy (GoK, 1976a) prohibited wildlife hunting (Western & Wright, 1994; Norton-Griffiths, 2000). Although it emphasised community involvement, this was poorly enforced, resulting in human-wildlife conflicts leading to biodiversity loss. The Wildlife Act was revised in 1989 (GoK, 1989) and in 2013 (GoK, 2013b). The Act is very specific, especially on critical ecosystems and their protection through clear management plans and species management strategies. This is in line with the CBD obligations of protecting biodiversity using the ecosystem approach. It stipulates strict penalties for poachers, with fines of over Kenya Shillings (KShs) twenty million on conviction. This is the first time Kenya has also formulated a tough legal framework in line with the CITES obligation of penalties on contrabands of endangered species. The framework embraces the spirit of devolution by encouraging the implementation of community-based conservation projects under the counties in collaboration with KWS. The Act has also addressed compensation arising from human-wildlife conflicts (GoK, 2013b). It has also tried to implement CBD Articles 8a and 9 which are *in-situ* and *ex-situ* conservation strategies through PAs and orphanages.

The Forest Act (2005) caters for sustainable management, including conservation and utilization of forests (GoK, 2005b). Under this Act all forests, except private and local authority forests, are protected by KFS. The Act gives communities permission to use the forests for cultural, educational or scientific reasons (GoK, 2005b). However communities must get permits to use forest produce for commercial purposes. The Act recognises the importance of indigenous knowledge which, combined with scientific knowledge should ensure better utilization of forest goods and services (IEA, 2011).

The National Museums and Heritage Act established the NMK as the government body in-charge of protecting, preserving, collecting and documenting Kenya's present and past cultural and natural heritage (GoK, 2006b). NMK has a number of *ex-situ* and *in-situ* biodiversity conservation sites. It maintains close links with international partners on *ex-situ* projects like the Kew Gardens in London, UK, as part of Kew's Millennium Seed Bank Project which aims to collect plant species

from Kenya's Arid and Semi Arid Lands (ASALs). It has also set up the Plant Conservation and Propagation Unit. In the past, Kenya Forest Research Institute (KEFRI) and the NMK have developed ethno-botanical gardens in the country and have been working with local communities to develop Kenya Research Network on Indigenous Knowledge, whereby the use of indigenous knowledge in medicines is being encouraged (IEA, 2011). The National Museums and Heritage Act has recognised a number of forests, such as the Kaya Forests, to be part of national monuments (GoK, 2006b). Through this Act, the Coastal Forest Conservation Unit (CFCU) was formed and the NMK was mandated with the task of taking care of the Kaya forests in collaboration with the local communities (IEA, 2011). Through the CFCU, donors have been encouraging farmers to venture into income generating activities like tree nurseries, bee keeping and ecotourism (Maunder *et. al.*, 2002; Githitho, 2003).

The Government of Kenya has established a strong institutional framework for the implementation and enforcement of biodiversity legislations through a network of public and non state institutions. The National Environment Secretariat (NES) was set up in 1974 under a Presidential Directive but NES was never given legal status during its existence. In 1992, together with the KWS and the NMK, NES developed the National Biodiversity Country Study Report. In 2003, NES was transformed by EMCA into the NEMA, which took over the mandate of coordinating and implementing all MEAs (NEMA, 2007). The setting up of NEMA has seen successful domestications and implementations of biodiversity MEAs (Manek, 2001; IEA, 2011). At the same time, to ensure effective implementation of MEAs, there was the creation of the Directorate of Conventions at the MEMR (MEWNR) and that of a convention coordination department at the KWS (Njogu, 2012).

The KWS was set up in 1990 under the Wildlife Act of 1989 (GoK, 1989). Its mandate is to protect all wildlife in the country, be in-charge of state PAs and also spearhead the implementation of biodiversity MEAs like CITES, CMS and Ramsar Convention. The KFS, formerly the Forest Department, was established in 2007 under the Forest Act (GoK, 2005b) to reactivate the management of forest biodiversity in the country. The government has also established the Department of Remote Sensing and Resource Surveys (DRSRS) whose mandate includes undertaking inventories of natural resources and mapping. Kenya Plant and Health Inspection

Service (KEPHIS) is another regulatory body established under the State Corporations Act of 1996 (GoK, 1996). It administers the Seed and Plant Variety Act (GoK, 1975; 2011), the Plant Protection Act and Agricultural Produce (Export) Act (GoK, 2012a) of which, the Seed and Plant Variety Act protects plant breeders' rights (GoK, 2011). In addition, the former Kenya Agricultural Research Institute, now known as Kenya Agricultural and Livestock Research Organisation is in-charge of the National Gene Bank of Kenya which was established in 1988 to take care of national genetic resources in collaboration with the Kenya Forest Research Institute (KEFRI), NMK and International Livestock Research Institute. Besides these institutions, the country also has a wide range of private institutions and non-state actors, which have been working closely with lead institutions to supplement their effort in safeguarding biodiversity (IEA, 2011). Some of the NGOs include the International Fund for Animal Welfare (IFAW), African Wildlife Foundation (AWF), African Conservation Centre (ACC), Nature Kenya and the African Fund for Endangered Wildlife.

Based on the legislations, Kenya has developed a wide range of national strategies and plans for the sustainable management of biodiversity in the country. The strategies include the National Conservation and Management Strategy for Elephants (2012-2021) (KWS, 2012), the National Conservation and Management Strategy for the Black Rhino and Management Guidelines for the White Rhino (2007-2011) (KWS, 2007) and the National Conservation and Management Strategy for Lions and Spotted Hyenas (KWS, 2010). A wide range of area-based biodiversity conservation plans have also been developed including Lake Nakuru Integrated Ecosystem Management Plan (2000-2012), Lake Nakuru-Elementaita Management Plan (2012-2017), Meru Conservation Area Management Plan (2007-2017), Samburu-Isiolo Conservation Plan (2010-2020), Aberdares Ecosystem Management Plan (2010-2020), Amboseli Ecosystem Management Plan (2008-2018), Maasai Mara National Reserve Management Plan (2009-2019) and Arabuko-Sokoke Strategic Forest Management Plan [ASFMP] (2002-2027). These plans are based on the country's conservation strategies of NBSAP and Vision 2030.

Kenya has shown that with the set up of institutions like KWS evidence shows that on the ground, effective implementation of the policies and frameworks is taking place. For example since 2007, there has been an improvement in the elephant ranges. Statistics from the African Elephant Database indicate that in 1995 the elephant range in Kenya was 135,096 km²; in 1998 it was 112,988 km² (Sitati, 2003); in 2007 it was 107,113 km² while in 2013 it was 111,423 km² (Weru,

2016). Similarly after the enactment of the Wildlife Act (GoK, 2013b), elephant and rhino deaths from poaching have reduced by 80% from 2012 to 2015 (Gitari *et. al.*, 2016). For example in 2011, only 177 elephants were poached while in 2012, 384 elephants were killed. However after the Wildlife Act (GoK, 2013b) came into force in 2013, poaching began to reduce as only 203 elephants were killed which indicated a 47.1% decrease from 2012 to 2013 and in 2014, only 164 elephants were killed (Weru, 2016).

However, weakness in the institutional capacity indicates that since 2009, more ivory has left the country with the lead exit points being the Port of Mombasa and the JKIA. Research by Milliken (2014) shows that more ivory has left the Port of Mombasa than any other trade route from Africa and most of it was destined for China and Hong Kong. At the same time the enforcement of the Wildlife Act (GoK, 2013b) has shown that the Kenyan authorities have also become strict and the Port of Mombasa and the JKIA since 2013 have recorded the highest seizures of wildlife contrabands in the Kenyan history (Weru, 2016). In 2013 the authorities at the Port of Mombasa confiscated the single largest haul of ivory in Kenya's history, weighing 2 tonnes and worth US\$ 1.15 million. This ivory was from Rwanda and Tanzania and was destined for Indonesia in the form of carvings (Muasya, 2015). Furthermore, since 2013 the Kenyan authorities have made remarkable achievements in arresting people found in possession with illegal contrabands. In 2012, they arrested 189 people; in 2013, 318 people were arrested while in 2014, 214 were arrested (*ibid*).

2.6 RESEARCH GAPS

Previous studies have established that it is not always easy for the countries of the world to implement MEAs effectively (Shihata, 1996; Weiss & Jacobson, 1998; Gray, 2003). The situation in Kenya has not been considered in previous studies. In terms of integration of biodiversity MEAs in national policies and legal frameworks, it is not clear whether Kenya has been able to integrate all MEA obligations. This is because the policies are more generalized and do not address issues of specific MEAs. This is the major gap the study aimed at addressing.

At the institutional level, Kenya has tried to domesticate and implement the biodiversity MEAs by setting up national focal institutions and dedicating personnel, finance and infrastructure capacity to these institutions. However, the inadequacy in terms of capacity based on the number of MEA sites

has not been assessed. Studies have also not been undertaken to establish whether the policies have been trickling down to the community level through the national focal institutions. This is the other gap which this study aimed at addressing.

2.7 THEORETICAL AND CONCEPTUAL FRAMEWORK

2.7.1 Theoretical framework

The effectiveness of environmental governance is based on cooperation from all stakeholders – global, national and local. This is because world biodiversity needs to be safeguarded across the globe with the goodwill of all relevant partners. At country level, successful implementation of biodiversity MEAs is only possible if the countries adopt and ratify them. The Regime Theory by Haggard and Simmons (1987) has boosted the knowledge on why and how biodiversity agreements are a challenge in terms of domestication and implementation (Kütting, 2000; Breitmeier *et. al.*, 2006; Oberthür & Gehring, 2006; Young *et. al.*, 2008). This theory states that MEA domestication and implementation is closely associated with the interests of developed countries where the MEAs originate from and also have their secretariats there. Moreover, the developing countries have to bear the brunt of making annual remittances to support the MEA secretariats in Europe and the USA resulting in outweighing their benefits against the implementation costs (Zelli *et. al.*, 2010). This means that the developed countries may impose biodiversity MEA terms to the developing countries. At the same time the theory also reflects why individual countries do not take all their stakeholders, including communities in consideration when managing biodiversity.

The Regime theory fits well in this study because it shows why Kenya has failed to domesticate all MEA obligations, the failure in terms of institutional capacity of the national MEA institutions namely KWS, KFS, MEWNR and the NMK and the extent to which the national biodiversity policies and MEA institutions have failed to involve the public in biodiversity management.

2.7.2 Operational framework

The conceptual framework (Figure 2-1) looks at how MEAs originate, which is from the UN where individual countries adopt them. Kenya, like other countries, has adopted the five biodiversity MEAs. It has then attempted to domesticate them by setting up policies and legal frameworks. Furthermore, the various legislations are associated the setting up of enforcement institutions,

namely NEMA, KWS, NMK and KFS as shown in Figure 2-1. The successful implementation of biodiversity MEAs should ultimately trickle down to the grassroots level.

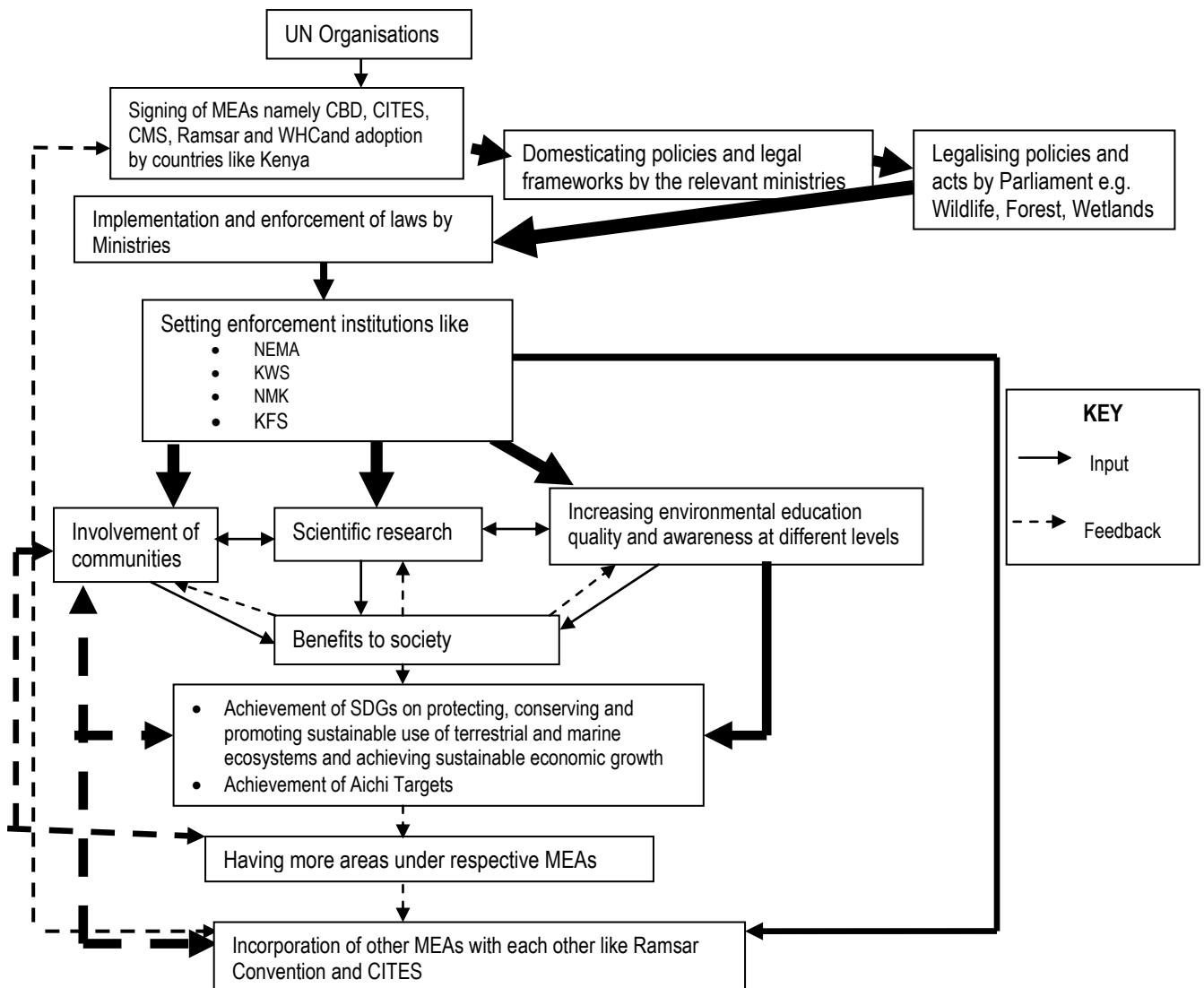


Figure 3- 1: Conceptual framework

Source: Researcher

Through the institutional set ups, there is policy implementation whereby communities are involved in biodiversity decision making. All this benefits the society who in turn works towards the achievement of the global goals and targets such as the Aichi biodiversity targets which will eventually enhance the conservation of terrestrial and marine ecosystems and species and ensure sustainable economic growth.

CHAPTER THREE STUDY AREAS

3.0 INTRODUCTION

This chapter describes the nine (9) sites where the study was done in Kenya. The case studies for the CBD included the Arabuko Sokoke Forest located in the coast region and Lake Nakuru National Park in the Rift Valley region. The study sites for the CITES consisted of three border points, namely Namanga at the Kenya-Tanzania border, the JKIA in Nairobi and the Port of Kilindini in Mombasa; the case studies for the CMS included the MMNR in southern Kenya and Lake Bogoria National Reserve in the Rift Valley. The study sites for the Ramsar Convention were Lakes Naivasha, Nakuru and Bogoria, all in the Rift Valley. The study sites for the Ramsar Convention were Lakes Naivasha, Nakuru and Bogoria, all in the Rift Valley. The study sites for the Ramsar Convention were Lakes Naivasha, Nakuru and Bogoria, all in the Rift Valley. The case studies for the WHC were Mt. Kenya National Park and Forest Reserve in the central highlands and the MMNR. Figure 3-1 shows the geographical locations of the nine sites.

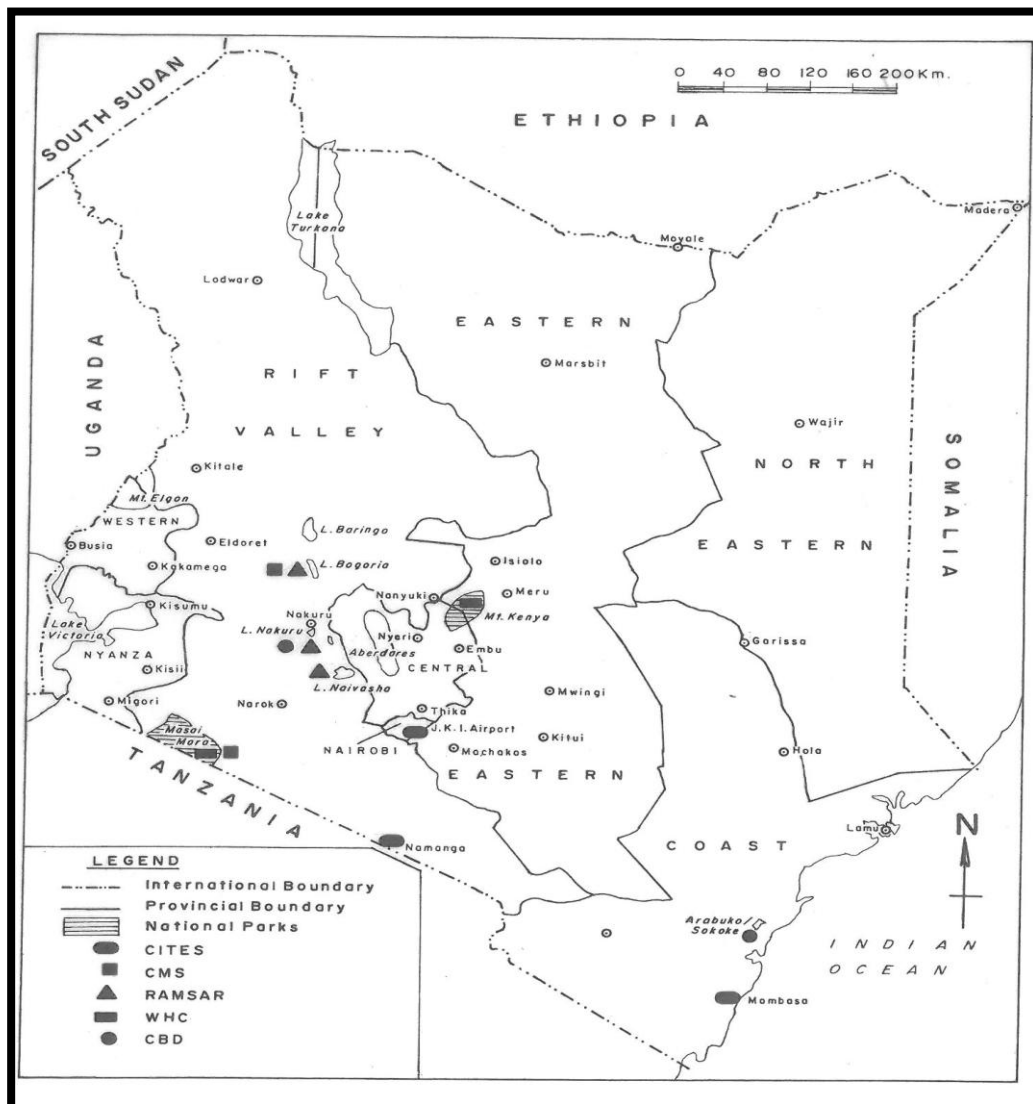


Figure 3- 1: Location of case study areas

The case studies were selected for different but related reasons. First, the study aimed at covering as much of Kenya's PAs as possible, while paying attention to the flora and fauna that are most prone to declining trends, and which are the objectives for MEA domestication and implementation. In addition, the study used stratified sampling to select the sites which were designated or tentatively listed under the five biodiversity MEAs namely the CBD, CMS, Ramsar Convention and the WHC. For the CITES, the sites were considered based on their role of international transport network and their potential role as centres of smuggling associated with biodiversity products.

3.1 STUDY SITES FOR THE CONVENTION ON BIOLOGICAL DIVERSITY

3.1.1 Arabuko Sokoke Forest

Arabuko Sokoke Forest is the largest remaining coastal forest block in the Eastern African region with an area of 416 km². It is located in the Kilifi and Malindi Counties at approximate of 3°20' South and 39°50' East (ASFMP, 2002) as shown in Figure 3-2. This site was selected based on its close proximity to local communities, the involvement of communities in benefit sharing and the wide stakeholder involvement from both the state and non state actors.

a) Demographic characteristics

Kilifi County is among the poorest regions in Kenya. According to the National Coordination Agency for Population and Development (NCAFD) (NCAFD, 2005), approximately 67% of Kilifi County's population have low levels of education. Birth rates in the county are very high. In 1999 the population was 100,000 (Kenya National Bureau of Statistics [KNBS], 1999) while in 2009 it increased to 160,000 (KNBS, 2009). The communities living around the forest are mainly small scale subsistence farmers with a few taking up dairy farming also (ASFMP, 2002).

b) Climatic factors

The mean annual rainfall of the forest ranges from 900 mm (in south west Arabuko) to 1,000 mm (at Gede in the north east). The dry season is from December to March while the long rains occur from April to June while the short rains, from July to November. The mean daily temperature is 25°C with humidity being at 60% annually, due to its proximity to the Indian Ocean. The eastern side of the forest has an altitude of 45 metres above sea level (asl) whereas the central and western sides have an altitude of 60-200 metres.

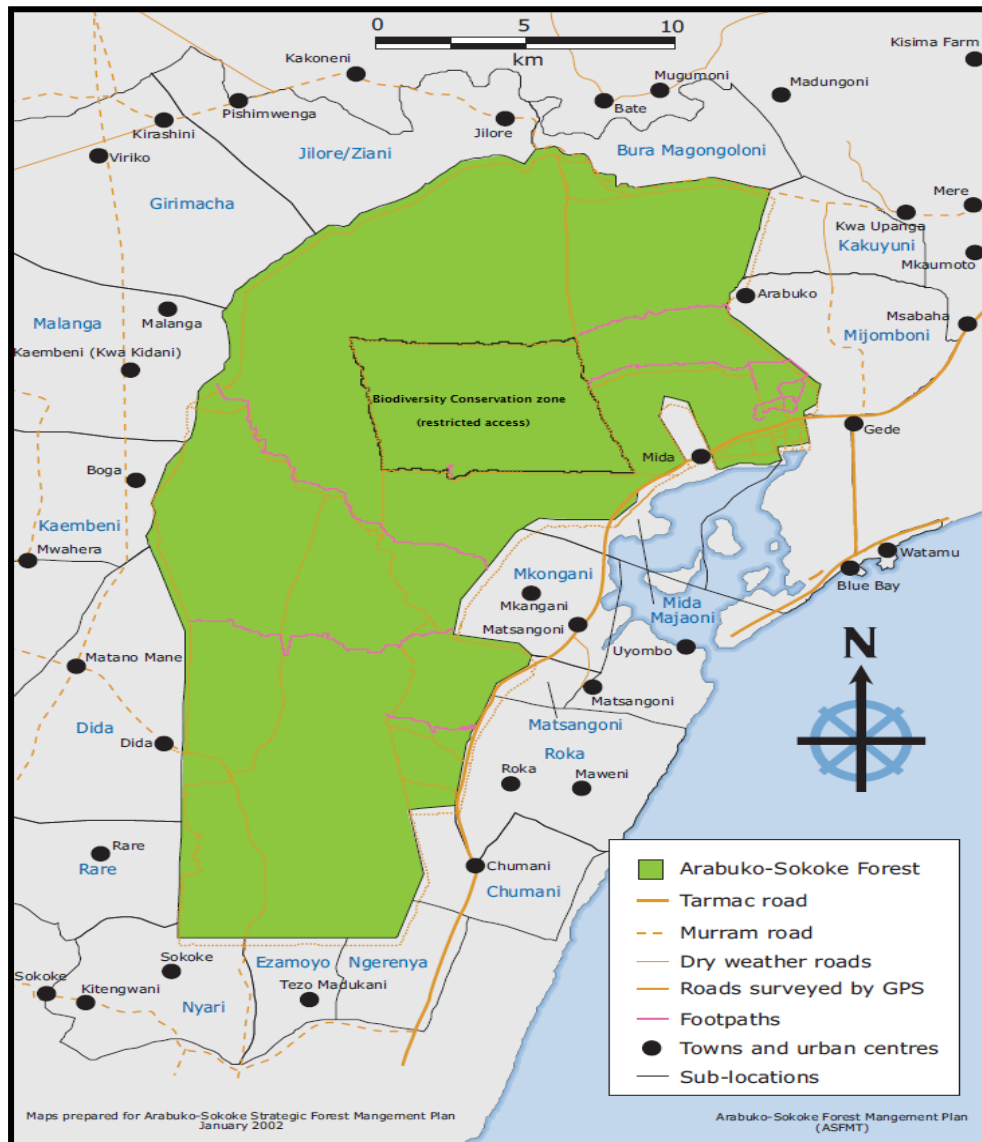


Figure 3- 2: The administrative characteristics of Arabuko Sokoke Forest

Source: ASFMP, 2002

c) Vegetation

The forest is part of World Biodiversity Hotspot 8, namely the Coastal Forests of Eastern Africa. It has three vegetation zones which are the mixed forest, *Brachystegia* forest and *Cynometra* forest. The mixed forest comprises of 70 km² and is found in the wetter coastal areas with a variety of indigenous tree species. It is more like semi-deciduous forest with an upper canopy, middle canopy, undergrowth and consisting of a wide range of native species such as *Manilkara sansibarensis* and *Azelia quanzensis* (Fanshawe, 1995). The size of *Brachystegia* forest is 77 km² and is dominated by the *Brachystegia spiciformiis*. The *Cynometra* forest is approximately 235 km²

in size and occupies 65% of the entire forest. It is dominated by *Cynometra webberi* and *Manilkara sulcata* (Blackett, 1994).

d) Fauna

Arabuko Sokoke has over 600 plants species, 270 birds, and close to 52 mammal species (KFS & Gede Community Forest Association [GCFA], 2011). It contains most of the country's birds and butterfly species with 10% and 30% respectively of the total number of these two existing in the forest which includes the Sokoke Scops Owl (*Otus ireneae*) Ripley and Amani Sunbird (*Anthreptes pallidigaster*) (Burgess *et. al.*, 1998; Bennun & Njoroge, 1999). The prominent mammalian species include the Sokoke Bushy-tailed Mongoose (*Bdeogale omnivore*) Heller and Golden-rumped Elephant Shrew (*Rhynchocyon chrysopygus*) Günther. The forest is ranked as the second most important forest for conservation of threatened bird species in the African mainland (ASFMP, 2002).

e) Administration

The forest was declared as a crown forest in 1932 and gazetted as a forest reserve in 1943. In 1968 the Kararacha part with an area of approximately 26.75 km² was added to the forest reserve. Thereafter in 1977, 4.3 km² of the forest was designated as a strict forest reserve and an additional 16.35 km² added in 1979. The forest is managed through three KFS forest stations, namely Gede, Jilore and Sokoke. In 1991, the KWS and the KFS signed a Memorandum of Understanding (MoU) regarding the governing and managing of designated natural forests throughout Kenya and Arabuko Sokoke Forest falls under this MoU.

3.1.2 Lake Nakuru National Park

Lake Nakuru is a shallow alkaline and saline endorheic (closed basin) lake located 160 km west of Nairobi in the eastern part of Nakuru County in the Rift Valley region and is part of Lake Nakuru National Park. The lake occupies 44 km² with a catchment area of 1,800 km² (WWF, 2000; KWS, 2002; Thampy, 2002). The park lies between the latitudes 0°17' and 0°30' South and longitudes 36°2' and 36°9' East as indicated in Figure 3-3. Lake Nakuru was selected as a CBD site because it is located just south of Nakuru, which is a major town with high population growth.

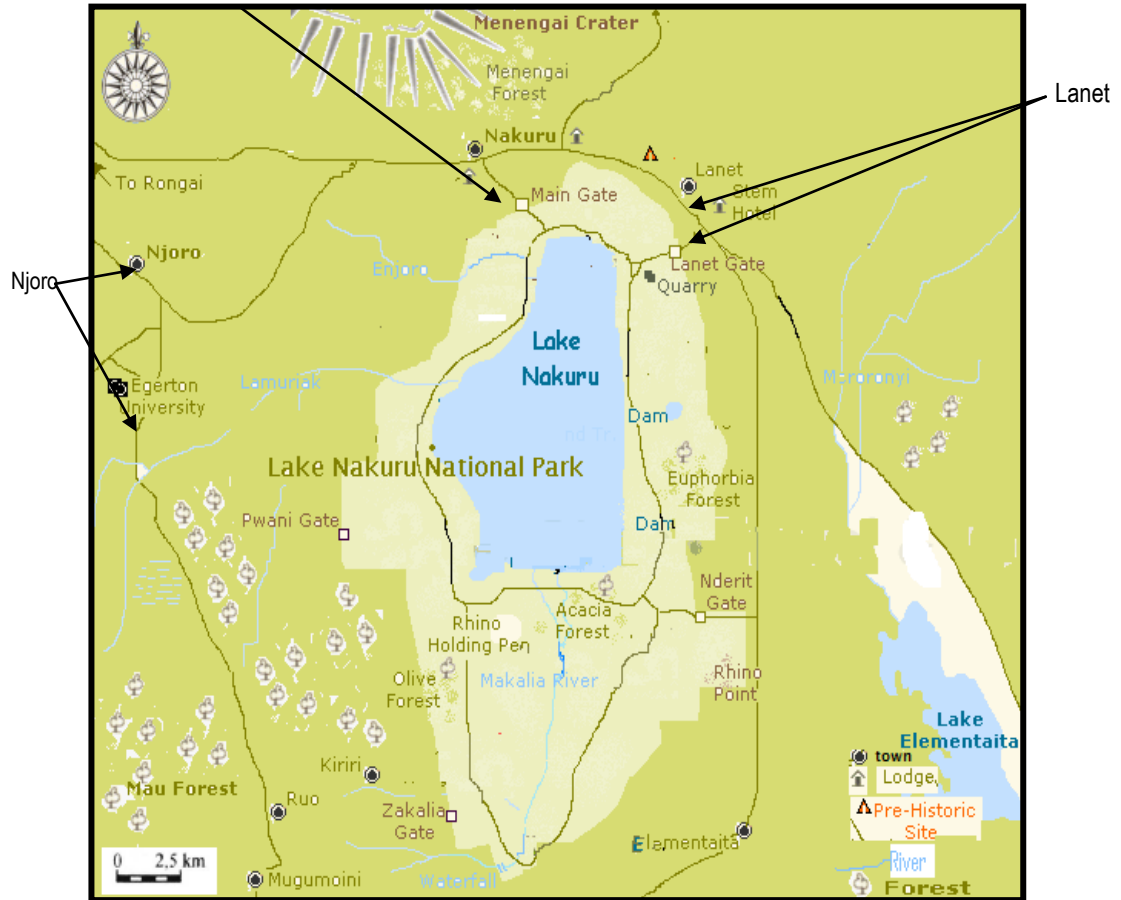


Figure 3- 3: Lake Nakuru National Park and the study sites
 Modified from www.shoortravelandtoursLtd/riftlakes (Accessed on 27th February 2012)

a) Demographic characteristics

The Eburan community occupied the lakeshore 10,000 to 30,000 years ago, followed by the Neolithic people who were then replaced by the Maasai. In 1969 the population of Nakuru town was 47,151; in 1999 it was 239,000 (KNBS, 1999; Foeken & Owuor, 2000) while in 2009 it was 286,411 (KNBS, 2009). The annual population growth rate of Nakuru County is estimated to be 4.85% while the town's growth rate is 10%. Most of the people around the lake shore and its catchment are agriculturalists.

b) Physical factors

The climate varies greatly within the lake catchment due to variable altitude. It fluctuates from hot to cold and humid to arid and semi-arid with annual average temperature being 27°C while the maximum temperature is 33°C and the minimum, 12°C. The mean annual rainfall is 750 mm. There are two rainfall seasons – the short rains from November to December and the long rains from April to May.

The lake lies at 1,750 metres asl and gets its waters from seasonal rivers, namely Njoro, Makalia, Nderit and Larmudiac. It also receives discharge from Baharini Springs and other fresh water springs from the Lion Hill (KWS, 2005a). The Baharini Springs flows permanently in the lake with the water originating from the Subukia region to the east of the lake (Banrock Station *et. al.*, 2004).

c) Vegetation

The lake ecosystem has over 300 plants' species (Kassilly, 2000; Banrock Station *et. al.*, 2004). The park landscape includes areas of marsh and grasslands alternating with bushy woodland in the rocky cliffs. The park has the Euphorbia forest dominated by *Euphorbia candelabrum* on the eastern side and Acacia forest immediately around the lake shore which is dominated by *Acacia xanthophlea*.

The lake catchment is rich in vegetation and has gazetted forests like the Mau, Eburu and Dundori. The Mau Forest which is part of the Mau complex covers an area of 650 km². It consists of both plantations and indigenous trees, including the red stinkwood and bamboo. Eburu Forest consists of indigenous tree species covering an area of 87.36 km² to the south of the lake while Dundori Forest in the eastern covers an area of 69.56 km².

d) Fauna

The park is dominated by savannah wildlife which includes fifty (50) different types of mammals including lions, the black rhino, and over 450 birds' species (Kassilly, 2000) including the Greater Flamingo (*Phoenicopterus ruberroseus*) and the Lesser Flamingo (*Phoenicopterus minor*). In the 1960s, Tilapia (*Oreochromis alcalicus graham*) was introduced in the lake and it has attracted a wide range of secondary consumers especially waterbirds like the pelicans and white cormorants (KWS, 2005b).

e) Administration

Lake Nakuru is the first park to be fenced all around in the country, thus becoming a closed, island ecosystem (Kassilly *et. al.*, 2008). Lake Nakuru was declared as a national park in 1957 in order to protect the flamingos and other water birds. In 1960, the southern lakeshore was established as a bird sanctuary and in 1961, more parts of the southern section of the lake were put included in the park. In 1968 the lake and the areas bordering it were added to the park. In 1972, the WWF contributed towards land purchase for the park's expansion leading to its current size of 188 km²

(Banrock Station *et. al.*, 2004). In 1987, the park was established as the first rhino sanctuary in Kenya and also gazetted as an Important Bird Area (IBA) in 1999 (Raini, 2009).

3.2 STUDY SITES FOR THE CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES OF WILD FLORA AND FAUNA

3.2.1 Namanga

Namanga in Kajiado County is a border town between Kenya and Tanzania (Figure 3-4). It is located between the latitude 2°31'03" South and longitude 36°49'42" East and is 200 km from Nairobi. The town is a very important link in the Northern corridor which connects to both North and South Africa through the Great North Road from Cape Town (South Africa) to Cairo (Egypt). Namanga was selected as a CITES study site because of it being an international border town between Kenya and Tanzania and has been known to be a notorious smuggling cross border town.

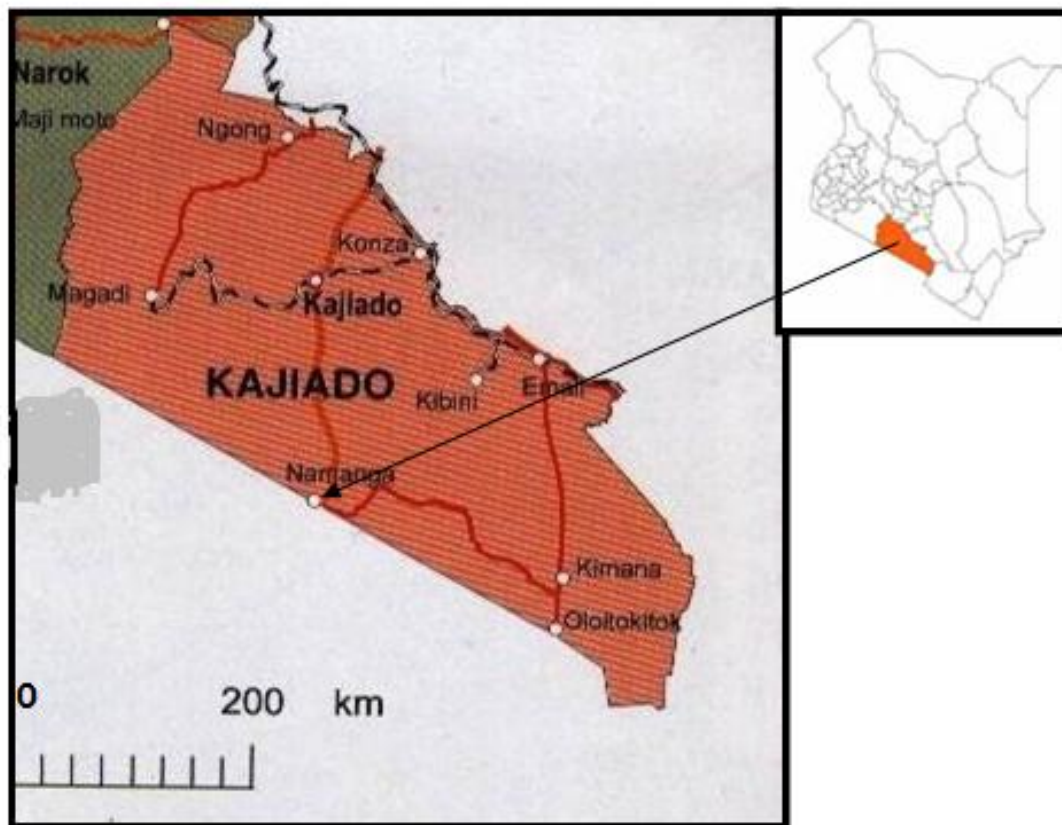


Figure 3- 4: Border town of Namanga
Source: Commission on Revenue Collection (CRC), 2010

a) Demographic characteristics

The population of Namanga town is 9,066 people (KNBS, 2009). The main activities in the town are small scale agriculture, pastoralism and small businesses. The town is an important customs station for Kenya and Tanzania which also handles trade goods from other countries such as Malawi, Azmbia, Zimbabwe, Namibia and the Republic of South Africa.

b) Biophysical factors

Namanga is located in an arid and semi-arid zone with the daily temperature ranging between 30° and 35°C. The mean annual rainfall is between 300 to 800 mm. The area has two rainy seasons with the short rains falling from October to December and the long rains from March to May. The area has two dry periods in June to October and January to February. The vegetation is mainly grassland and acacia shrubland.

c) Administration

The border town is characterized by offices supporting the implementation of CITES and other frameworks. They include the customs, Kenya Revenue Authority (KRA), KEPHIS, KWS, KFS, Ministry of Agriculture, Livestock and Fisheries and the Kenya Police. The border post is expected to prevent illegal biodiversity trade (Gachanja, 2012).

3.2.2 Port of Kilindini

The Port of Kilindini is located in Mombasa County on the Kenyan Coast, between 02°46,791' South and 40°10,907' East (Figure 3-5). The maritime network served by the Port is very large and includes the Middle East, Asia and Europe. In East Africa it is the only major sea port between Tanzania and the Red Sea. A lot of goods are traded through the port especially to Europe and Asia making it an easy transit zone for illegal biological products like ivory. The port was selected as a CITES site because it is a major sea port of the Indian Ocean where a lot of goods pass from the country including those in transit. Research conducted by Milliken (2014) found that since 2009 the Port had the highest exit of ivory from all the trading routes in Africa, destined to China and Hong Kong.

a) Demographic characteristics

Mombasa is one of the ancient port cities on the Indian Ocean with a long history stretching to the historical Arab ivory and slave trade in the twelfth and thirteenth centuries (Were & Wilson, 1968). The port city is the country's second largest city in Kenya, with a population of 939,370 (KNBS,

2009). It is dominated by the Miji Kenda, Pokomo and the Swahili people. It serves many countries in the region including Uganda, Burundi, Rwanda and the DRC.

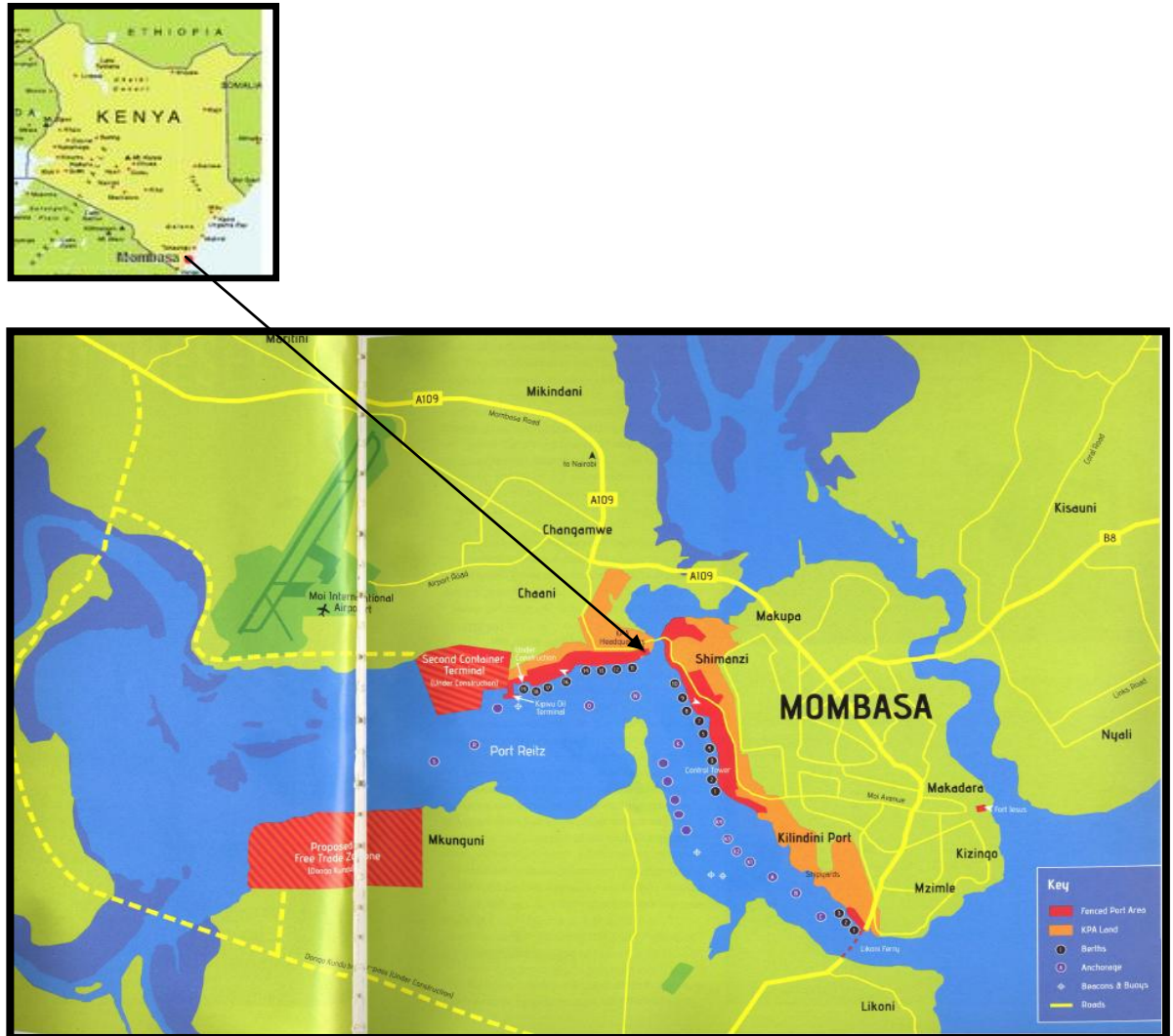


Figure 3- 5: Port of Mombasa

Source: KPA, 2012

b) Biophysical factors

Mombasa is characterized by the tropical climate with the weather being influenced by the monsoon winds from the Indian Ocean. It experiences dry weather from November to March due to the influence of the northeast monsoon. The coastal region experiences heavy monsoon rain in March and April. The mean annual temperature is 32°C (UNEP, 1998). Temperatures are cool from May to August while the mean annual rainfall is 1000 mm and evaporation rates are as low as 138 mm in June increasing to 221 mm in March. The port city is associated with a wide range of

exotic flora and fauna as a result of many years of interaction with the Arabian Peninsula and the Asian region. Some prominent exotic species which are part of the coast region are the mango (*Mangifera indica*) and the neem tree (*Azadirachta indica*) both from India, cashew nut (*Anacardium occidentale*) from Brazil and the notorious Indian crow (*Corvus splendens*) from India.

c) Administration

Kilindini is a major sea port managed by the Kenya Ports Authority (KPA) which was established on 20th January 1978 (Mukabana, 2007). The port has government offices which deal with the implementation of CITES and other frameworks through several agencies such as the KRA, KWS, KFS and Kenya Police. Kilindini Port has sixteen deep water berths, two bulk oil jetties and one cased oil jetty (KPA, 2010). The major exports through the port include coffee, petroleum products and cement and the major imports include food, live animals and assembled motor vehicles.

3.2.3 Jomo Kenyatta International Airport

The JKIA is the largest airport in Kenya and the seventh largest in Africa (ASN, 2010). It is located at 1,624 metres and is 13 km east of the city centre in the Embakasi Division of Nairobi at 01°19'09" South and 036°55'39" East (Figure 3-6). JKIA is surrounded by an industrial and residential zone in the north, military area and residential plots in the east, Kenya pipeline depot and industries in the west, while the south is occupied by residential areas (ASN, 2010). It is the avian hub and transit point for all regional and international flights into and out of Kenya especially to Europe and to Asian countries like India, China and Thailand. The airport serves a wide range of African countries and is a notorious transit point for biological products like ivory and rhino horns to many countries in Asia including China. JKIA was selected as a CITES case study due to it being an international air route connecting Kenya with other countries and continents as well as it being as a transit point for passengers connecting flights within and outside Africa.

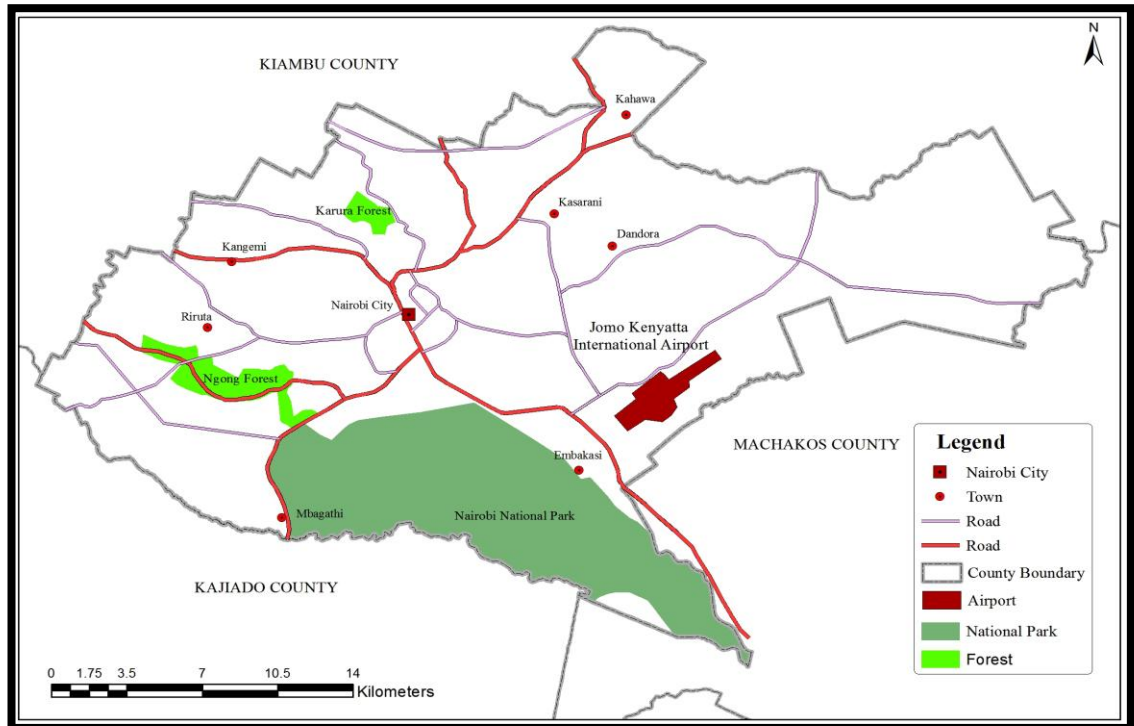


Figure 3- 6: Map of Nairobi showing the location of Jomo Kenyatta International Airport

Source: Researcher

a) Demographic characteristics

Nairobi with an area of 58,300 km² has population of over 3 million (KNBS, 2009). The population around the Embakasi Sub-location is 65,014 people (KNBS, 2009). Approximately over five hundred taxi drivers operate directly from the airport. The JKIA serves a total of about seven (7) million passengers and handles approximately 300,000 tonnes of cargo each year.

b) Biophysical factors

Nairobi is a Maasai word for “cool waters”. The mean temperature is 25.5°C while the minimum is 12.5°C. The city receives the long rains from March to May and the short rains from mid-October to mid-December. The total annual rainfall is 785 mm and the relative humidity is between 40-97% (CCN, 2007). The airport is surrounded by undeveloped areas which have bush lands, grasslands and wildlife (GIBB Africa, 2006).

c) Administration

The airport was set up in 1975 and is managed by the Kenya Airports Authority (KAA) (GIBB Africa, 2006). It was previously known as Embakasi Airport and later, as Nairobi International Airport. The airport is a very important CITES surveillance site as all goods to and from the country and those in transit pass through it. In order to implement conventions like CITES, it has many

government offices including the immigration office, KRA, Kenya Police, International Police (INTERPOL), KWS, Lusaka Agreement Taskforce office, as well as security agencies.

3.3 STUDY SITES FOR THE CONVENTION ON THE CONSERVATION OF MIGRATORY SPECIES OF WILD ANIMALS

3.3.1 Maasai Mara National Reserve

The MMNR is located at 34°45' and 35°25' East and 1°13' and 1°45' South (Figure 3-7) and is part of the larger Mara-Serengeti ecosystem, which includes the Serengeti National Park and Ngorongoro Conservation Area in Tanzania in terms of wildlife movement. In terms of size, the greater Mara-Serengeti ecosystem is 25,000 km². The MMNR is located in Narok County. The ecosystem lies at a general altitude of 1,600 m and covers approximately 6,500 km², out of which 25% is MMNR (Walpole *et. al.*, 2003). The MMNR was selected as a CMS site as it is a transboundary ecosystem between Kenya and Tanzania and is a home to many migratory species.

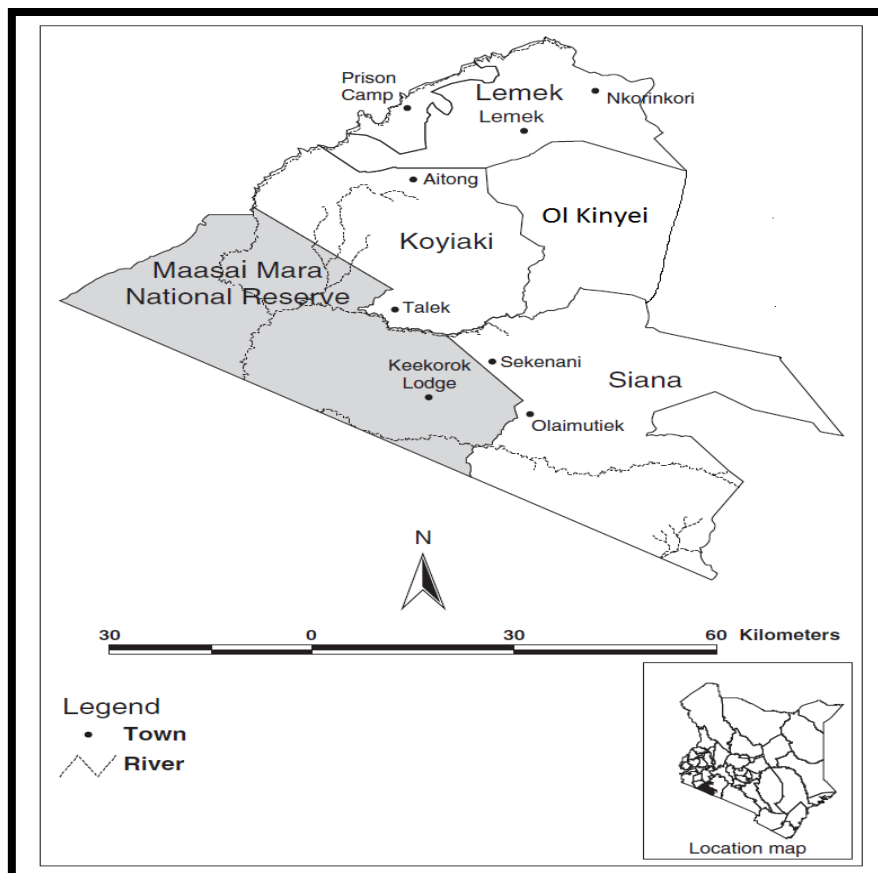


Figure 3- 7: Maasai Mara National Reserve and surroundings

Source: Thompson *et. al.*, 2009

a) Demographic characteristics

In 2007, the population around the MMNR was approximately 20,000 (Coast, 2001; Thompson & Homewood, 2002; Homewood *et. al.*, 2004; Hoffman, 2007). Most of the people are pastoralists.

b) Physical factors

The MMNR has a mean annual rainfall of 1015 mm which is bimodal, with the long rains occurring between April and May and short rains between December and January (Thompson *et. al.*, 2009). The dry period is from mid-June to mid-October with a short dry season, from January to February. Daily maximum temperatures range between 26° to 30°C, while minimum temperatures range between 12° to 14°C (Western & Waithaka, 2005). The MMNR is bisected by the Mara River which forms the border between Narok County in the east and the former Trans Mara Sub-County to the west. The east and the south of the MMNR is bounded by the Loita Hills and to the north and the west, by the Siria escarpment (Kiyiapi *et. al.*, 1996).

c) Vegetation

The reserve consists of four types of vegetation namely grasslands, scrublands, woodlands and forests. Grasslands are dominated by *Themeda triandra*, *Penisetum mezianum* and *Indigofera spinosa* while the shrublands are dominated by *Acacia drepanolobium* and the riverine bush is dominated by *Glycine spp.* The forest habitat is dominated by *Dichrostachys cinerea* and *Cordia ovalis* (Kassilly *et. al.*, 2008). Woody vegetation is mainly concentrated along the riverine forest along Mara River and is dominated by *Croton dichogamus* and *Acacia* woodlands (Dublin, 1984, 1991; Nabaala, 2000).

d) Fauna

The MMNR is very famous for wildlife, especially the “big five” of Africa (elephant, lion, leopard, buffalo and rhino). It is world renowned for the annual wildebeest migration spectacle to and from the Serengeti in Tanzania which involves about 2 million wildebeests and 200,000 plain zebras across the Mara River (Lamprey & Reid, 2004). It also has very diverse birdlife with 452 species, of which 53 are raptors (Kokai, 1992).

e) Administration

The MMNR started as a wildlife sanctuary under the Mara Conservancy in 1948 with a total of 520 km² being declared as protected land and designated as a national reserve and placed under the Narok County Council (NCC). In 1961 its area was increased to 1,831 km². However in 1984,

through a formal agreement, 301 km² was excised to provide access to the watering points for livestock. Currently the area of the MMNR stands at 1,530 km² (NCC & Trans Mara County Council [TMCC], 2009; Ogutu *et. al.*, 2011). In 1995 the MMNR was gazetted to be under the joint management of Narok County and Trans Mara Sub-County. The NCC manages the reserve east of the Mara River while the Trans Mara office manages the reserve west of the river which is also known as the Mara Triangle.

3.3.2 Lake Bogoria National Reserve

Lake Bogoria National Reserve lies between 36°4' and 36°7' East and 0°20' North and is about 10 km North of the equator within Baringo and Koibatek Counties (Figure 3-8). It lies at an altitude of between 970 metres at the lake to 1,650 metres on the Siracho escarpment. The lake, with an area of 34 km², is endorheic and saline and is located in a catchment basin covering 1,200 km² within the Rift Valley. The lake water has a high alkalinity with pH ranging between 9.8-10.6 (Baringo County Council [BCC] & Koibatek County Council [KCC], 2007). This CMS site was considered because it is part of the flamingo lakes of Kenya and hosts 75% of all the migratory lesser flamingo population of the country.

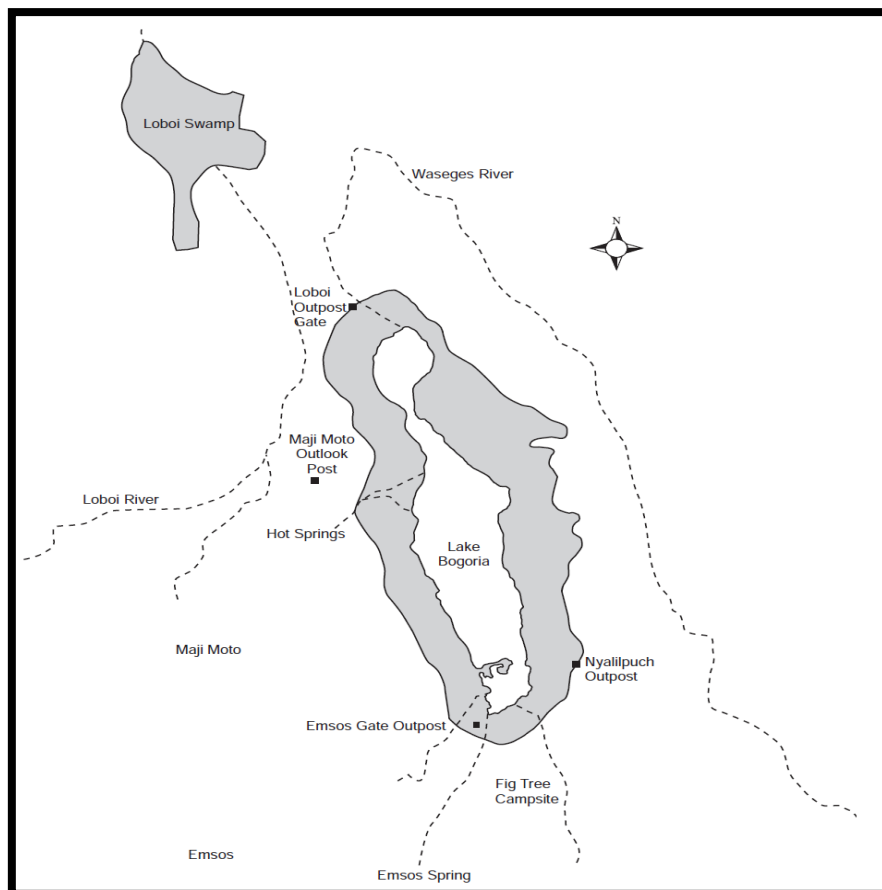


Figure 3- 8: Lake Bogoria and the surroundings

Source: BCC and KCC, 2007

a) Demographic characteristics

The population in the basin catchment was estimated at 49,000 (KNBS, 2009) and continues to increase, mainly due to immigration. The total human population adjacent to the reserve was estimated at 10,000 inhabitants (BCC & KCC, 2007). Most people are agropastoralists and pastoralists. The local people have been living in harmony with the migratory flamingos.

b) Physical factors

The site is located in an arid and semi-arid area with high temperatures ranging from 18° to 39°C. The daily mean temperature is 25°C with January to March as the hottest period and July to August as the cold period. The mean annual rainfall is between 500 to 1000 mm (BCC & KCC, 2007). Annual rainfall in the basin floor is only about 400 mm while in the escarpment it is 1000 mm. The area is characterised by two wet seasons from April to May and October to November. Lake Bogoria gets fresh water from the Waseges and Lobo Rivers originating from the Bahati and Marmanet Forests in the upper catchment which feed from the Igwamiti and River Subukia originating in Laikipia (WWF, 2011a).

c) Biodiversity

Bogoria is part of the “flamingo lakes” of Kenya which are of global, regional, national and local importance. The lake hosts 75% of all the migratory lesser flamingo population (Njogu, 2012) in Kenya. Annually approximately 1.5 million lesser flamingos move from lakes Bogoria, Nakuru and Elementaita. Lake Bogoria is also a key nesting and breeding ground for the great white pelicans (*Pelecanidae*) (UNEP-WCMC, 2011). It is also an IBA with over 310 species of resident and migratory birds including over 70 species of water birds. The biodiversity of the area also includes the species like the Cape buffalo and Greater Kudu (*Tragelaphus strepsiceros*) while the vegetation is dominated by *Acacia tortilis*, *Acacia mellifera* and *Commiphora*.

d) Administration

Lake Bogoria National Reserve, with an area of 107 km² was gazetted as a national reserve in 1970 and later designated as a world heritage site under the Great Lakes Circuit in June 2011 because of its international importance as a crucial habitat for the lesser flamingos and other migratory bird species.

3.4 STUDY SITES FOR THE RAMSAR CONVENTION

3.4.1 Lake Naivasha

Lake Naivasha is a shallow basin fresh water lake on the floor of the eastern Rift Valley, lying between 0°45' South and 36°26' East (Becht & Harper, 2002; Everard & Harper, 2002). Its catchment area is approximately 3,400 km² and stretches from the Aberdare mountain ranges in the north and north east to Olkaria and Longonot mountains in the south and south east, bounded by the Mau escarpment in the west, Eburu to the north and the Kinangop plateau in the east. Figure 3-9 shows the lake area and the study sites. The lake was selected as a Ramsar site because it was second to be designated by Kenya in 1995.



Figure 3- 9: Lake Naivasha and the study sites

Source: WWF, 2011b

Lake Naivasha is the second largest fresh water lake in Kenya, lying at an altitude of 1,890 metres asl. Its average depth is between 3 to 6 metres and its size is 150 km² (Hickley *et. al.*, 2002). The lake water seeps into an underground aquifer formed due to tectonic movements (Gaudet &

Melack, 1981) and then moves southwards towards Longonot and into Lake Magadi and also northwards towards Gilgil and Lake Elementaita (Clarke *et. al.*, 1990; Ojiambo *et. al.*, 2001). It is fed by two permanent rivers, namely Rivers Gilgil and Malewa, which drain into the lake from the Nyandarua Ranges. River Malewa drains from the Aberdare Range, Kipipiri Mountain and the Kinangop Plateau. Other seasonal rivers include River Karati, which drains to the east of the lake while the west of the lake receives underground water from Eburu Forest in the Mau Hills. The lake has no surface outlet.

a) Demographic characteristics

According to the 2009 census (KNBS, 2009), the total population of Naivasha basin was 650,000 people, of which approximately 160,000 lived around the lake. The population is increasing very fast due to population growth and immigration. From 1989 to 1999 the basin's population grew by 64% which was attributed by the growth of the horticultural industry (WWF, 2011b). The main activities in the area include agriculture, livestock husbandry, pastoralism, tourism and fishing.

b) Climatic factors

The mean annual temperature in the basin varies with altitude, ranging from 25°C on the shores of the lake to 16°C in the Aberdares, with daily temperatures ranging from 5° to 25°C. The Aberdare range casts a rain shadow over the rest of the basin leading to an average rainfall of 1,350 mm in the upper catchment and 600 mm in the lower catchment. Rainfall is bimodal with two rainy seasons in April-May (long rains) and October-November (short rains) (Ase *et. al.*, 1986; Ojiambo *et. al.*, 2001).

c) Biodiversity

The lake is an IBA No. 48 with over 470 bird species, including the fish eagle (*Haliaeetus vocifer*) which is considered as a flagship species. It was put under the Ramsar designation as it supports more than 20,000 water birds (Criteria V) and also has 1% of the world's red knobbed coot (*Fulica cristata*) population (Criteria VI). The lake has no indigenous fish but introduced fish, including Gervais (*Tilapia zillii*), guppy (*Poecilia reticulata*), common carp *Cyprinus carpio* and black bass *Micropterus salmoides* (Hickley *et. al.*, 2002). It has a variety of mammals, including hippos (*Hippopotamus amphibious*), gazelles, Cape buffalo, giraffes and wildebeests.

d) Administration

The lake was designated as the country's second Ramsar site in 1995 (No. 724). Its designation came because of the lake's ecological value to the region. The lake is a very unique Ramsar site as it is not legally gazetted as a PA under Kenyan laws. Before 2010 the riparian land was under the custodianship of the Lake Naivasha Riparian Association which was formed in 1927. However, under the new constitution, the custodianship of this land is now under the National Government.

3.4.2 Lake Bogoria National Reserve

Lake Bogoria was designated as Kenya's third Ramsar site (No. 1097) on 27th August 2001 (WWF, 2011a). It was designated as a Ramsar site because it is a critical habitat for the lesser flamingo (Ramsar Convention's designation Criteria II). This lake was considered as a Ramsar site because it was selected to be designated by Kenya as its third Ramsar site in 2001.

Refer to Section 3.3.2 for more details

3.4.3 Lake Nakuru National Park

Lake Nakuru is the country's first Ramsar site (No. 476) designated in 1990. The site was designated as the lake supports over 1% of the world's lesser flamingos (Criteria VI of Ramsar sites). This lake was considered as a Ramsar site because it was selected to be designated by Kenya as its first Ramsar site in 1990.

Refer to Section 3.1.2 for more details

3.5 STUDY SITES FOR THE WORLD HERITAGE CONVENTION

3.5.1 Mount Kenya National Park and Forest Reserve

It is located between 00°20' South and 00°20' North and 37°10' and 37°30' East and lies between altitudes 1600 to 5199 metres (Figure 3-10). Mt. Kenya was formed by volcanic activity 100-400 million years ago, and is the highest mountain in Kenya with the height of 5199 metres and the second highest in Africa, with Mt. Kilimanjaro being the highest in the continent. This mountain was considered as a WHC site because it was selected to be designated by Kenya as its first WHC site in 1997.

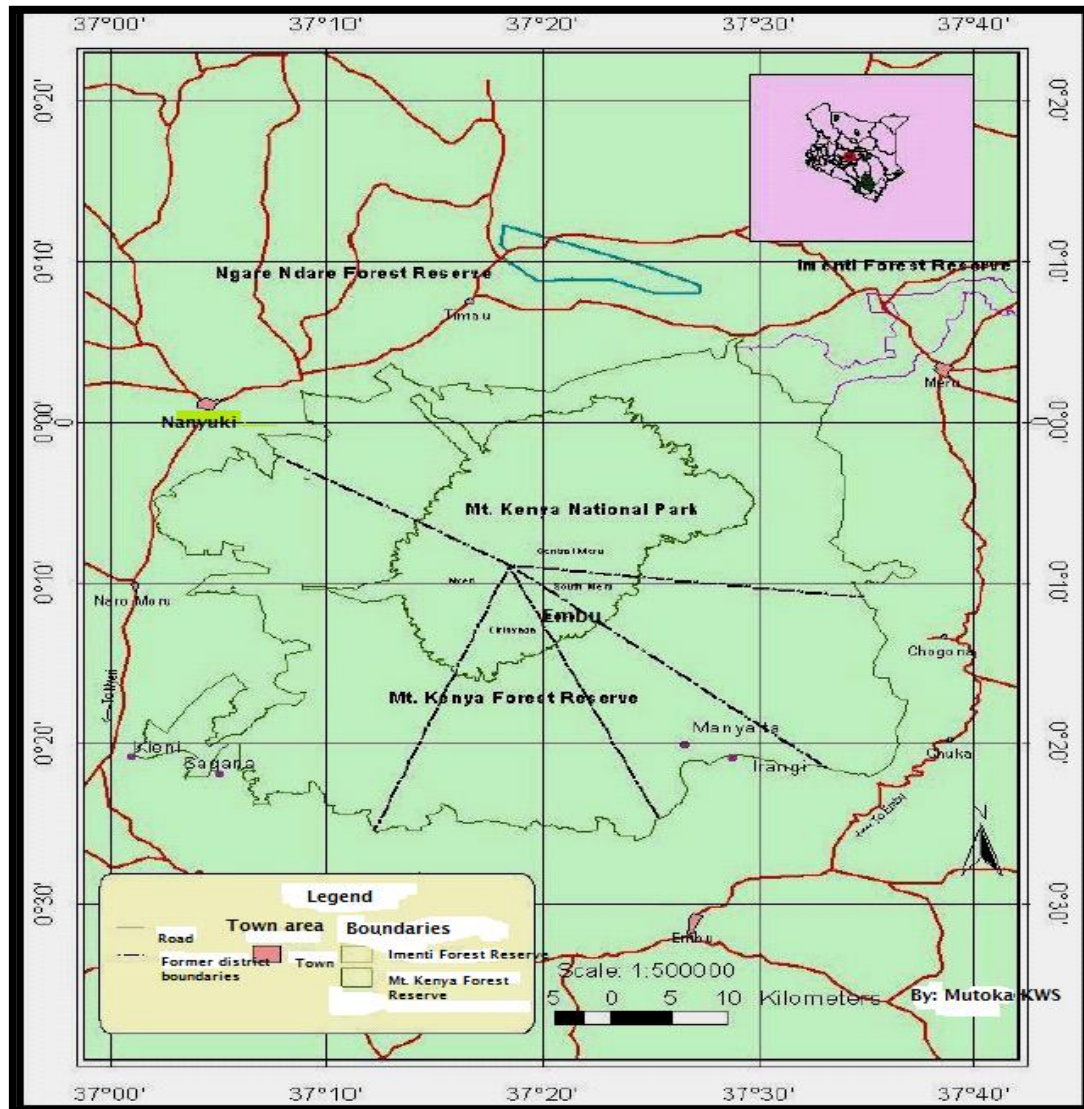


Figure 3- 10: Mt. Kenya Forest and National Reserve

Source: KWS and UNESCO, 2001

a) Demographic characteristics

According to Tanui (2006), the population around Mt. Kenya region in 1969 was 1,419,757 which increased to 3,724,159 in 1999 (KNBS, 1999) and 4,383,743 in 2009 (KNBS, 2009). The communities living around Mt. Kenya National Park and the Reserve are mainly agriculturalists. To the south are the Embu and Meru to the east with the Kikuyu to the west. The north is mainly occupied by agriculturalists and pastoralists.

b) Physical factors

Mt. Kenya National Park is located 3,200 metres asl. The national park experiences two rainfall seasons with the long rains from March to June and short rains from October to December. The

leeward side, including Nanyuki, receives lower rainfall of about 900 mm per annum while the south eastern windward sides of Embu and Meru receive rainfall of 2,300 mm annually. Its driest months are January and February (KWS & KFS, 2010).

c) Vegetation

The mountain vegetation consists of open moorlands between 2,000 and 3,500 m, *Euracecuos* giant heath zone below pure bamboo (*Arudinaria spp*) between 2,550 and 2,650 m and mixed bamboo between 2,500 to 3,200 m. Indigenous tropical forest stretches from 2,400 m at 2,000 m and is dominated by *podocarpus latifolia*. Other forest types occur at lower altitude between 1,500 and 2,400 m dominated *Ocotea*, *Newtonia*, *Croton sylvaticus-Premna* and other species. The mountain also has an introduced plantation forest zone with cypress (*Cupressus lusitanica*) and pine.

d) Fauna

Mt. Kenya forest is rich in wildlife and includes mammal species like the giant forest hog (*Hylochoerus meinertzhageni*) and bongo antelope (*Tragelaphus euryceros isaaci*). It has the largest elephant population in Kenyan forests. It is designated as an IBA due to its rich birdlife which includes hartlaub's turaco (*Turaco hartlaubi*), silvery cheeked-hornbill (*Ceratogymna brevis*) and the endemic species of the sharpes long claw (*Macronyx sharpie*). The forest also has a wide variety of reptiles including the agama lizard (*Agama agama*) and endemic snakes such as the mountain wiper.

e) Administration

The park was designated as the country's fourth national park in 1949 (KWS & KFS, 2010) after Nairobi, Tsavo and Marsabit National Parks. The size of the park is about 700 km² which includes the Sirimon and Naro Moru extensions which were added in 1968. In 1978 both the park and reserve were designated as UNESCO Biosphere Reserve under the UNESCO's MAB Programme (GEF, 2004). The Mt. Kenya National Park was declared as a WHC site in 1997 based on its Criteria VII of exceptional natural beauty and aesthetic value and Criteria IX of outstanding value in terms of ecological and biological processes. The reserve and the park are jointly managed by the KFS and KWS (KWS & KFS, 2010).

3.5.2 Maasai Mara National Reserve

The MMNR has been tentatively listed under the WHC. This is based on the WHC's Criteria V which recognizes that the local Maasai living next to the MMNR have been living in harmony with the wildlife; Criteria VII on outstanding value of the MMNR due to the annual wildebeest migration for which the Mara-Serengeti ecosystem was designated the seven wonders of the world and Criteria X of the MMNR as a wintering spot for paleoarctic migrants and a home to threatened wildlife species like the lion and cheetah.

Refer to Section 3.3.1 for more details

CHAPTER FOUR

RESEARCH METHODOLOGY

4.0 INTRODUCTION

This chapter examines the methods used to address the research objectives and test the hypotheses for this study. It discusses the various sources of the data which were utilised by the study, methods of data collection, data analysis and interpretation techniques.

4.1 RESEARCH DESIGN

In terms of research design, the study used both the quantitative and qualitative approaches. Quantitative approach involves the collection of numeric data to get phenomena results of interest which includes means, pie charts and bar graphs. Under this approach the deductive process is used whereby a theory is tested through specific hypotheses. Qualitative approach is the collection of extensive narrative (non-numeric) data in order to get insights into the phenomena of interests and includes open-ended questions so that respondents can express their own views. Under this approach, the inductive (narrative) process is used whereby the researcher visits the respondents personally so that the researcher can interpret the information collected from the field correctly. Questionnaires and in-depth interviews were used to collect data. Both quantitative and qualitative approaches are based on the philosophical approach of epistemology and theoretical perspective.

This study used the survey design to collect data. This was a sample survey which was multi-stage sampling and included random and purposive sampling. The questionnaire was administered to the respondents so as to collect information. Random sampling was used to collect data from household respondents. It was used because it is unbiased and represents the total population. Purposive sampling was used for specific target population which included the directors of MEA focal institutions, the managers of the MEA conservation and operational sites and the staff working for biodiversity institutions at the various CITES sites. Data from the household respondents was collected based on personnel information, educational background and details on PAs while from the information collected from staff working in biodiversity institutions included personnel information, systemic, institutional and individual capacity and conservation and operational sites related questions. The resulting data was analysed through statistical and non-statistical methods.

4.2 RESEARCH PARADIGM

Research paradigm consists of concepts, variables and problems which are linked to methodology approaches and analytical tools (Kuhn, 1962). Furthermore, paradigm is a set of values and assumptions which researchers have in common when conducting research (Kuhn, 1977). Epistemology is a branch of research paradigm. It is the philosophy which is concerned with theories of knowledge and it helps us understand how much we know about the world (Creswell, 2009). One school of thought based on theories of knowledge and used in this research is post positivism. The post positivist assumptions are based on existing knowledge and introduction of knowledge. Post positivism is based on philosophy in which causes determine the outcomes or results (*ibid*).

4.3 DATA TYPES AND SOURCES

The study relied mainly on primary data collected from the field, but in some cases secondary data from various data stores were also used to support the primary data.

4.3.1 Data types

The data was both primary and secondary. Primary data was obtained from staff working in various biodiversity institutions and household respondents through the use of questionnaires while secondary data was obtained from biodiversity MEAs, MEA reports and also included reports from various biodiversity institutions amongst others.

4.3.1.1 Data collection strategy

There were three different groups of target population. One group was the directors of the national MEA focal institutions, while the other comprised of the heads of the MEA study sites in the field and the third group involved community household respondents living around the MEA sites. The directors and the heads of the study sites were considered as key informants while the household heads were considered as ordinary respondents. The government staff at all the CITES sites were selected purposively as they were employees of institutions which were related to biodiversity governance and it was assumed that they had good knowledge on the biodiversity MEA implementation issues. The data from all the three groups was collected through the use of standard questionnaires. There were different sets of questionnaires for two groups of respondents – the community such as the respondents for Arabuko Sokoke Forest as shown in Annex 1Ai and

Annex 1Aii and those for the directors of lead institutions including site managers as shown in Annex 1B. There were two different questionnaires for community respondents also – one for respondents in the CBD, CMS, Ramsar Convention and the WHC (Annex 1Ai) and another for respondents of CITES (Annex 1Aii). This was necessary because the issues for the CITES were slightly different from those of the other MEAs.

4.3.1.2 Sampling frame

All the MEA-based focal institutions were selected purposively based on their designation in terms of coordinating and implementing the MEAs nationally. The directors of the MEA focal institutions namely MEWNR, KWS and NMK were selected using purposive sampling. The site managers of the study (operational) sites namely Arabuko Sokoke Forest, Lake Nakuru National Park, Maasai Mara National Reserve, Lake Bogoria National Reserve, Lake Naivasha and Mt. Kenya National Park, Namanga, JKIA and Port of Mombasa were also selected using purposive sampling while community respondents were considered through household survey and selected using random sampling. Random sampling was done using the hat method where households were given numbers and these numbers were thoroughly mixed before being picked. The selection of the numbers by the respondents was done without replacement so as to ensure that there was no double selection even though all the remaining people had an equal chance of being selected as explained below.

4.3.1.3 Determination of sample size

For household surveys, the population data for each MEA site was obtained from the KNBS (2009) database. The population data was sorted in terms of locations bordering the selected study sites. This was further sorted by the sub-locations which were easily accessible. Then random selection of the sub-locations was done, from which households were also selected randomly as shown in Annex 2. A total of 2,109 household heads, 1,518 (72%) males and 591 (28%) females, were included in the sample according to the distribution in Table 4-1. The selection of the respondents was done using Cochran’s (1963) formula as illustrated in Equation 4-1.

$$n = \frac{N}{1 + N (e)^2} \dots\dots\dots(\text{Eq. 4-1})$$

Where: n=sample size; N=households; e=error margin and 1=constant

Table 4-1 shows the overall coverage of the MEAs in terms of the number of household respondents.

Table 4- 1: Number of household respondents in different MEAs

MEA	No. of household respondents (%)	No. of males (%)	No. of females (%)
CBD	399 (18.9%)	263 (65.9%)	136 (34.1%)
CITES	390 (18.5%)	281 (72.1%)	109 (27.9%)
CMS	350 (16.6%)	277 (79.1%)	73 (20.9%)
Ramsar Convention	569 (27.0%)	399 (70.1%)	170 (29.9%)
WHC	401 (19.0%)	298 (74.3%)	103 (25.7%)
Total	2109 (100%)	1518 (72%)	591 (28%)

Source: Researcher

4.3.2 Data sources

The first set of data sources were obtained by undertaking comprehensive policy analysis to assess the integration of MEAs in national biodiversity policies. Secondary data was also used in the assessment of the level of effectiveness in the implementation of MEA agenda in the various national biodiversity institutions.

4.3.2.1 Primary data

Field data was sourced using questionnaires, direct observations and photographs. The variables collected from the MEA focal point directors and site managers were personal information; systemic, institutional and individual capacity and site-related questions as highlighted in Annex 1B. From the household surveys the variables collected were personal information, educational background and public perception on various MEAs as highlighted in Annex 1Ai and 1Aii.

4.3.2.2 Secondary data

The secondary data included annual, programme and project reports among other documents. The secondary data included the analysis of biodiversity MEAs to determine the various obligations to be implemented at national level. This information was obtained from the relevant MEA secretariats, UNEP and UNESCO and their respective websites. Other information containing the various MEA CoP meetings and agreed CoP decisions were also obtained from the relevant MEA websites and the UNEP publications. Journal articles were also used to check on the effectiveness of the domestication and implementation of the relevant MEAs and successes and failures of

various obligations. The CBD Strategic Plan for Biodiversity 2011-2020 and the Aichi Targets were also used because they gave clear indications of a country's targets and achievements.

The other types of secondary data used were the biodiversity-related national policies which included the National Constitution of Kenya (GoK, 2010), Wildlife Policy (GoK, 2012f), Sessional Paper No. 6 on Environment and Development (GoK, 1999b), Draft Environment Policy (GoK, 2013a), Forest Policy (GoK, 2014), National Wetlands Conservation and Management Policy (GoK, 2015) and the National Policy on Culture and Heritage (GoK, 2009c). The policies which are operational were obtained from the Government Printer and websites of national biodiversity institutions, while those in the draft form were obtained from the relevant ministries developing them. In order to assess the level of integration of MEA obligations into national biodiversity policies a check list was used (Annex 3). Initially all biodiversity policies were listed down and then sorted in accordance with the prescriptions related to individual MEA obligations. The policy prescriptions were thoroughly screened and cross-checked against relevant MEA obligations and a table of policies and their relevant prescriptions was generated as shown in Annex 4. Other documents used for secondary data acquisition were the NBSAP, Vision 2030, NEAP and management plans for the study sites.

4.4 PRIMARY DATA COLLECTION

Primary data collection was undertaken using twenty institutional (focal and site institutions) respondents who were selected purposively and 2,109 community household respondents selected randomly.

4.4.1 Reconnaissance

The primary data collection was preceded by a reconnaissance on the target population with the intention of determining the sample size and pre-test data collection instruments. The reconnaissance was conducted around Lake Naivasha and within the boundaries of the JKIA between May to July 2011. During this pilot, it was realised that the questionnaire to be used for the CBD, CMS, Ramsar Convention and WHC could not be used for the CITES respondents as the issues for CITES were slightly different. Thereafter, a different questionnaire was generated for CITES respondents.

4.4.2 Duration of data collection

The actual field data collection took place at different times for different sites as shown in Table 4-2.

Table 4- 2: Data collection time frame at MEA sites

MEA conservation and operational site	Time frame
Lake Nakuru National Park	8 th to 17 th January 2012
Arabuko Sokoke Forest	11 th to 17 th August 2012 – 1 st round 12 th to 19 th October 2012 – 2 nd round
Namanga	19 th to 22 nd June 2012
Port of Mombasa	22 nd to 26 th October 2012
JKIA	5 th to 8 th December 2012
Lake Bogoria National Reserve	21 st to 26 th November 2012
MMNR	2 nd to 9 th November 2012
Lake Naivasha	23 rd July to 2 nd August 2012 – 1 st round 28 th to 30 th January 2013 – 2 nd round
Mt. Kenya National Park/Reserve	24 th to 27 th April 2013 – Embu 7 th to 10 th May 2013 – Nanyuki

Source: Researcher

4.4.3 The respondents

4.4.3.1 MEA focal point directors

At the MEA focal institutions, priority was to get the director but if not available, the researcher depended on the high level personnel delegated by the head office. The focal point respondents are shown in Table 4-3.

Table 4- 3: National headquarters of MEA focal institutions and the selected respondents

MEA	National headquarters of MEA focal office	Respondent	Total no. of respondents per MEA
CBD	MEMR (Nairobi)	Deputy director	1
CITES	KWS (Nairobi)	Research scientist	1
CMS	KWS (Nairobi)	Research scientist	1
Ramsar Convention	KWS (Nairobi)	Research scientist	1
WHC	NMK (Nairobi)	Director	1
Total			5

Source: Researcher

4.4.3.2 MEA conservation and operational site managers

At the study sites, priority was given to the site managers but if the manager was not available, then the senior most official was consulted. These officials included foresters, resident scientists, KWS officers, chief rangers, site inspectors and chief wardens.

The overall target was one respondent per study site as it was assumed that the study site locations were under the same focal institution. However, the number varied from one study site to the other. For example, around Lake Nakuru National Park where the target locations were Nakuru town, Lanet and Njoro, the focal institution for Nakuru town and Lanet was KWS while for Njoro, it was KFS. This meant that the study site of Lake Nakuru National Park had two respondents because the focal institutions were different. The same was the case of Mt. Kenya National Park, where the study locations were Embu and Nanyuki. The Embu side was under the focal management of KFS while Nanyuki side was under KWS. Table 4-4 shows the distribution of key informants for the MEA sites.

Table 4- 4: Respondent officers at MEA sites

MEA	MEA conservation and operational site	Respondent (affiliated focal institution)	Total no. of respondents per MEA
CBD	Arabuko Sokoke Forest	Forester (KFS)	3
	Lake Nakuru National Park (Nakuru, Lanet)	Resident scientist (KWS)	
	Lake Nakuru National Park (Njoro)	Forester (KFS)	
Ramsar Convention	Lake Nakuru National Park (Nakuru, Lanet)	Resident scientist (KWS)	4
	Lake Nakuru National Park (Njoro)	Forester (KFS)	
	Lake Naivasha	Resident scientist (KWS)	
	Lake Bogoria National Reserve	Chief warden (KWS)	
CITES	Namanga	Chief ranger (KWS)	3
	Port of Mombasa	Site inspector (KWS)	
	JKIA	Site inspector (KWS)	
CMS	MMNR	Resident scientist (KWS)	2
	Lake Bogoria National Reserve	Chief warden (KWS)	
WHC	Mt. Kenya National Park (Embu)	Forester (KFS)	3
	Mt. Kenya National Park (Nanyuki)	Chief ranger (KWS)	
	MMNR	Resident scientist (KWS)	
Total			15

Source: Researcher

4.4.3.3 Households surveys

a) Lake Nakuru

Around Lake Nakuru National Park three locations were considered in the study, namely Lanet, Nakuru Municipality and Njoro. A total of 194 respondents were selected. Lanet was selected due to its close proximity to the park so that first hand information would be obtained from the respondents. The respondents in Lanet's Mwariki "B" were all residents living and working around

the Stem Hotel on the main Nakuru-Nairobi highway up to the Kenya Pipeline Station which borders the national park. Mwariki “B” is a new sub-location which was set up in 2007. Nakuru Municipality was selected due to its direct proximity to the national park. The respondents were all from Lake View Estate in Baharini Sub-location of Bondeni Location. In Njoro, interviews were conducted in Njoro Sub-location along the Njoro (Ndarugu) River, approximately 5 km from Egerton University towards the entry to Njoro town. The household respondents were dominated by males because during the normal working hours the men in Njoro and Lanet were available at home as most worked on their household farms. In Bondeni, the interviews were done in the evenings when most of the household heads were available at home. Table 4-5 shows the total population of the selected sub-locations of Mwaniki “B”, Baharini and Njoro including the distribution of the respondents by gender.

Table 4- 5: The sampling components around Lake Nakuru National Park

County	Division	Location	Sub-location	Total population		House holds	No. of units in the sample (%)		No. of respondents (%)
				M	F		M	F	
Nakuru	Lanet	Lanet	Mwariki “B”	4782	2486	2486	39 (60.9%)	25 (29.1%)	64 (33%)
Nakuru	Nakuru Municipality	Bondeni	Baharini	8354	8724	4829	33 (54.1%)	28 (45.9%)	61 (31.4%)
Nakuru	Njoro	Njoro	Njoro	19591	20079	10149	43 (62.3%)	26 (37.7%)	69 (35.6%)
Total				32727	31289	17464	115 (59.3%)	79 (40.7%)	194 (100%)

Data source: KNBS (2009)

b) Arabuko Sokoke

A total of 205 respondents were selected in Arabuko Sokoke Forest, mainly from Nyari Sub-location of Sokoke Location; Mijomboni Sub-location in Gede Location and Jilore/Ziani Sub-location in Jilore Location as indicated in Table 4-6. These sub-locations were selected due to their closeness to the forest reserve as well as good accessibility. In Gede, the area was further stratified into two – one stratum for the Watta Community (as they were indigenous to the area) and the other for indigenous communities in Gede. The Arabuko A village was used for the Watta community while the Arabuko B village was used for the respondents who were not indigenous to the Gede area. For the Gede Watta community whose total number was only 2000, selection of respondents was done from an official community meeting, organised by KFS on the 13th August 2012 and attended by 316 household heads. The researcher took advantage of the community

meeting and through the forest official addressed the Watta community on the purpose of this research. According to the official, all the 316 household heads were interested so a random selection of participants was made. The interviews were done in the evenings and early mornings between 11th to 17th August 2012 and 12th to 19th October 2012 when the household heads were at home. Table 4-6 shows human population of the selected sub-locations of Nyari, Mijomboni and Jilore/Ziani including the distribution of respondents by gender.

Table 4- 6: The sampling components around Arabuko Sokoke Forest

County	Division	Location	Sub-location	Total population		House holds	No. of units in the sample (%)		No. of respondents (%)
				M	F		M	F	
Kilifi	Vitengeni	Sokoke	Nyari	2297	2566	683	19 (63.3%)	11 (36.7%)	30 (14.6%)
Malindi	Malindi	Gede	Mijomboni	2744	2804	766	39 (76.5%)	12 (23.5%)	51 (24.9%)
			Mijomboni (Watta community)				78 (75%)	26 (25%)	104 (50.7%)
Malindi	Langobaya	Jilore	Jilore/Ziani	1470	1630	484	12 (60%)	8 (40%)	20 (9.8%)
Total				6511	7000	1933	148 (72.2%)	57 (27.8%)	205 (100%)

Data source: KNBS (2009)

c) Namanga

In Namanga, all the respondents were from Namanga Location, Namanga Sub-location and Namanga Division of Kajiado Central Sub County. A total of 110 respondents were selected randomly using the 2009 census system. In addition thirty-two (16.1%) government officials were selected purposively which included the Criminal Investigation Department (CID), Kenya Police, Immigration, KEPHIS, Ministry of Fisheries, KWS, KFS and KRA. Other respondents included non-government officials including 20 (10.1%) clearing agents, 36 (18.2%) “spike boys” who, with the custom officials, did the searches in the vehicles and 110 (55.6%) household respondents. Males were 158 (79.8%) and females were 40 (20.2%). The gender pattern was driven by the fact that most of the workers at the border point were mostly men due to the nature of the job which requires heavy duty and traditionally men have been used to this type of work and today also, it is the same.

d) Port of Mombasa

All the 150 respondents at Kilindini were from Chaani Sub-location, Chaani Location, Changamwe Division of Kilindini Sub County. They were selected from the port’s headquarters and included 55

(36.7%) government officials (Kenya Police, CID, KRA, KWS and KPA staff), 55 (36.7%) clearing agents and 40 (26.6%) residents. The total respondents include 93 (62%) males and 57 (38%) females. This pattern was driven by the fact that most of the workers at the port were men.

e) Jomo Kenyatta International Airport

At the JKIA, all the respondents were from Embakasi Sub-location, Embakasi Location and Embakasi Division of Nairobi East Sub County. All the 42 respondents were selected from the JKIA premises and included 32 (76.2%) airport personnel (CID, Kenya Police, KRA, KWS anti-poaching unit and KAA) and 10 (23.8%) taxi drivers. The respondents include 30 (71.4%) males and 12 (28.6%) females. All taxi drivers and majority of the government officers were male.

The reason for the difference in the respondents' numbers in the three CITES sites was attributed to accessibility to respondents and security. In Namanga it was easy to approach the residents and government officials but this was not the case at the Port of Mombasa and the JKIA. At the port it was difficult to get access to the government officials as most stated that a prior appointment was needed. In the case of JKIA, the government officials were very friendly and approachable. However, due to the airport being a busy zone as well as a security area, only 42 respondents were interviewed. Since the general sample size $n=30$ was already achieved at the airport, 42 was considered as a good sample size.

f) Lake Bogoria

Around Lake Bogoria National Reserve two locations, namely Lobo and Koabos in Baringo County were considered due to their close proximity to the reserve, for which a total of 152 respondents were selected. In Lobo interviews were done in Chelaba Sub-location while in Koabos they were done in Maji Moto Sub-location. The male gender dominated both administrative clusters, as indicated in Table 4-7. In Chelaba this was because the interviews were conducted during daytime on week days when the household heads (mainly males) were available at their work stations such as farms or in the cattle fields. In Maji Moto the pattern was attributed to the interview time over a weekend when household heads (mainly males) were at home. Table 4-7 shows the population of the selected sub-locations of Chelaba and Maji Moto and the distribution of respondents (Korir, 2011).

Table 4- 7: The sampling components around Lake Bogoria National Reserve

County	Division	Location	Sub-location	Total population		House holds	No. of units in the sample (%)		No. of respondents (%)
				M	F		M	F	
Baringo	Marigat	Loboi (Sandai)	Chelaba	546	540	209	73 (75.3%)	24 (24.7%)	97 (63.8%)
Baringo	Mogotio	Koabos (Emsos)	Maji Moto	495	504	182	47 (85.5%)	8 (14.5%)	55 (36.2%)
Total				1041	1044	391	120 (78.9%)	32 (21.1%)	152 (100%)

Data source: KNBS (2009)

Table 4-7 shows that the number of respondents was smaller in Maji Moto (Emsos) compared to Chelaba (Sandai) due to accessibility and language barrier. Chelaba was easier to access due to a good transport network. In the case of Maji Moto the site was 30 kms away from the main gate of the reserve and accessibility was only by a four wheel drive or motorcycle. Furthermore the households and villages were far from each other. Each village and the nearest shopping centre were approximately 2 to 3 kms away from the other villages and households were not visible from the main road. During the interview period in November 2012, rainfall was a hindrance and high water levels in the rivers and streams making movement difficult. Moreover very few respondents in Maji Moto understood English, compared to the respondents in Chelaba and a translator was required. Equally, the interviews on the issues pertaining to Lake Bogoria were not well received. The respondents stated that without the presence of the chief, they found it difficult to trust the interviewers as in the past there had been a couple of negative outcomes from previous interviews. They also stressed that since the area did not have enough security, they feared the interviewers in many cases, could not be trusted. These reactions were probably attributed to the case filed by the local people at the African Commission on Human and Peoples' Rights ('the African Commission') over their expulsion from Lake Bogoria National Reserve.

g) Maasai Mara National Reserve

A total of 198 respondents were considered in the MMNR. They were selected from two locations in Narok County namely Koiyaki and Ol Kinyei which were close to the MMNR and accessible. In Koiyaki Location, Sekenani and Koiyaki sub-locations were selected while Endoinyo Narasha Sub-location in Ol Kinyei was selected. In both the locations the number of males was high due to Maasai cultural practices which prevent females from talking to strangers. Previous studies have shown the same (Sitati *et. al.*, 2007). The interviews in both locations were conducted either in the

morning hours when the men folk were at home and the women had gone to fetch firewood or in the evenings when young Maasai men (morans) had returned from herding. In Sekenani Sub-location, the interviews were conducted in three villages, namely Olai Mutiai, Ole Kikoror and Ol Okuaion while in Koiyaki Sub-location interviews were conducted in four villages, namely Ole Kasoi, Olo Loint, Ole Seike and Dipili Kwani. In Endoinyo Narasha Sub-location all the respondents were from the Il Turillshow village as it had more adults, such that one village was enough to get the respondents. In both Sekenani and Koiyaki sub-locations the selected villages were more than one as each village had more children than the adults during the interview time. Table 4-8 shows the population characteristics of the selected sub-locations of Sekenani, Endoinyo Narasha and Koiyaki and the distribution of respondents by gender.

Table 4- 8: The sampling components around MMNR

County	Division	Location	Sub-location	Total population		House holds	No. of units in the sample (%)		No. of respondents (%)
				M	F		M	F	
Narok	Mara	Koiyaki	Sekenani	1681	1513	706	47 (68.1%)	22 (31.9%)	69 (34.8%)
Narok	Mara	Ol Kinyei	Endoinyo Narasha	2042	2227	896	50 (79.4%)	13 (20.6%)	63 (31.8%)
Narok	Mara	Koiyaki	Koiyaki	2994	2503	1170	60 (90.9%)	6 (9.1%)	66 (33.4%)
Total				6717	6243	2772	157 (79.3%)	41 (20.7%)	198 (100%)

Data source: KNBS (2009)

h) Lake Naivasha

Four locations were selected around Lake Naivasha, namely Naivasha Town, Moi Ndabi and Hells Gate with a total of 223 respondents. Moi Ndabi's selection was based on the fact that it has a fish landing beach in Kamere Village of Moi Ndabi Sub-location. In Hell's Gate, Kwamuhia area in Mirera Sub-location was selected based on the majority of Naivasha's flower farms being there. In addition Engineer was selected as a site in the catchment with a focus on Kirima Village in Murungaru Sub-location. In addition, Naivasha Municipality was selected due to its proximity to the lake, and the respondents were selected from Crescent Island and Karagiita area of Sokoni Sub-location. Table 4-9 shows the population characteristics of the selected sub-locations of Murungaru, Sokoni, Moi Ndabi and Mirera and the segregation of respondents by gender.

Table 4- 9: The sampling components around Lake Naivasha

County	Division	Location	Sub-location	Total population		House holds	No. of units in the sample (%)		No. of respondents (%)
				M	F		M	F	
Nyandarua	Kinangop North	Engineer	Murungaru	7147	7562	3352	14 (35.9%)	25 (64.1%)	39 (17.5%)
Nakuru	Naivasha Municipality	Naivasha Town	Sokoni	22317	23226	15657	56 (94.9%)	3 (5.1%)	59 (26.5%)
Nakuru	Kongoni	Moi Ndabi (Kamere)	Moi Ndabi	1647	1605	952	48 (75%)	16 (25%)	64 (28.7%)
Nakuru	Naivasha	Hell's Gate (Kwamuhia)	Mirera	19554	19655	12953	46 (75.4%)	15 (24.6%)	61 (27.3%)
Total				5065	52048	32914	164 (73.5%)	59 (26.5%)	223 (100%)

Data source: KNBS (2009)

i) Mount Kenya National Park and Forest Reserve

A total of 203 respondents around Mt. Kenya National Park and Reserve were selected from Embu and Laikipia Counties. In both counties one location was selected. In Embu County they were selected from Manyatta Village in Manyatta Sub-location of Ngandori East. In Laikipia County, respondents were selected from Kanyoni Village in Thingithu Sub-location of Nanyuki Location. Ngandori East was selected as it is on the windward side of Mt. Kenya while Nanyuki was selected as it is on the leeward side and the village borders Mt. Kenya Forest Reserve to derive the views of people from both sides of the mountain. Table 4-10 shows the population characteristics of the selected sub-locations of Manyatta and Thingithu and the distribution of respondents by gender.

Table 4- 10: The sampling components around Mt. Kenya National Park

County	Division	Location	Sub-location	Total population		House holds	No. of units in the sample (%)		No. of respondents (%)
				M	F		M	F	
Embu	Manyatta	Ngandori East	Manyatta	1375	1658	743	68 (70.1%)	29 (29.9%)	97 (47.8%)
Laikipia	Central	Nanyuki	Thingithu	6935	7200	4200	73 (68.9%)	33 (31.3%)	106 (52.2%)
Total				8310	8858	4943	141 (69.5%)	62 (30.5%)	203 (100%)

Data source: KNBS (2009)

4.5 DATA PROCESSING AND ANALYSES

4.5.1 Data processing

The first stage in data processing involved quality control whereby the researcher constantly kept on checking whether the questionnaires were being filled correctly in the field or not. This was then followed by quality assurance where the completed questionnaires were cross-checked to

establish whether all the information was captured. Thereafter the data was coded in code book which was followed by data entry and data cleaning using Statistical Package for the Social Sciences (SPSS Version 17.0). This was then followed by data analysis.

4.5.2 Data analyses

Data analysis involved analytical tools and exploratory analysis where computation of descriptive statistics, frequencies and cross-tabulation to measure distribution tendencies to determine aggregation and dispersion were undertaken. The study used both descriptive and inferential statistics for analysis.

4.5.2.1 Analytical tools

The study used analytical tools to assess the domestication and application of MEAs at national level. This involved comprehensive analysis sixteen (16) national biodiversity policies. It also involved the computation of the Obligation Integration Susceptibility Index (OISI) (Researcher, 2016) and the Policy Prescription Integration Susceptibility Index (PPISI) (Researcher, 2016). The OISI was used to determine the integration level of each MEA in national policy. The OISI was used for cross-checking the proportion of MEA obligations featuring in national policies. If all the MEA obligations featured in a policy, the score was 100%. If only some obligations featured in a policy, the total number of obligations divided by the total number of obligations was multiplied by 100 (see Equation 4-2).

$$\frac{\text{Number of obligations policy featured in}}{\text{Total number of obligations}} \times 100 \quad \dots\dots(\text{Eq. 4-2})$$

A standard classification system was used in order to check whether the obligations reflected well in all the relevant biodiversity policies as indicated in Table 4-11.

Table 4- 11: Level of national biodiversity policy integration

Score (%)	Level of integration
90-100	Excellent
70-89	Very good
50-69	Good
40-49	Weak
39 and below	Very weak

Source: Researcher

The PPISI was used to assess the level of integration by checking the policy prescriptions in relation to relevant MEA obligations. The total relevant prescriptions per obligation of each policy were converted into percentages. For example, if a policy had a total of five policy prescriptions relevant to the CBD, then these five policy prescriptions were cross checked against each obligation in order to establish which prescriptions were relevant in relation to international obligations. The percentage of these prescriptions per obligation was calculated as shown in Equation 4-3. This was done to determine the Individual Policy Prescriptions (IPP).

$$\frac{\textit{Total prescriptions per obligation}}{\textit{Total policy prescriptions per policy for each relevant MEA}} \times 100 \quad (\text{Eq. 4-3})$$

Once this percentage was obtained, all the percentage policy prescriptions of each policy were calculated against each MEA obligation in the same manner. Thereafter, the total percentage policy prescriptions of each policy per obligation were added per row and divided by the total number of policies per MEA as shown in Equation 4-4 in order to determine the Obligation Policy Prescription Integration Index (OPPII).

$$\frac{\textit{Total \% of all policy prescriptions per obligation}}{\textit{Total policies}} \quad (\text{Eq. 4-4})$$

The OPPII showed which obligation was effectively domesticated through adequate integration in national policies.

The calculations of the percentage of all prescriptions per policy were then computed for the relevant MEA obligations in order to show which policy had captured the total policy prescriptions per obligation which was then divided by the number of obligations as shown in Equation 4-5 so as to get the PPISI.

$$\frac{\textit{Total \% of all policy prescriptions per obligation}}{\textit{Total obligations}} \quad (\text{Eq. 4-5})$$

In order to determine the level of overall integration per MEA, the average percentage integration levels of each policy was added and then divided by the total number of policies relevant to each MEA. This was done as indicated in Equation 4-6 in order to determine the respective MEA Integration Susceptibility Index.

$$\frac{\text{Average \% compliance status of each policy}}{\text{Total number of policies}}$$

(Eq. 4-6)

4.5.2.2 Descriptive statistics

The descriptive statistics included summary statistics and cross-tabulations. Descriptive statistics were computed to provide the general patterns of the magnitude and distribution of data. Cross-tabulations were computed to determine the relationships both within and across the datasets. The advanced analysis was undertaken using a number of inferential statistics.

4.5.2.3 Inferential statistics

The inferential statistics used were Kruskal-Wallis, Chi square, Paired t-test and the Coefficient of determination. All the inferential statistics were tested at α 0.05 (i.e. 95% level of confidence).

4.5.2.3.1 Kruskal-Wallis H test

The Kruskal-Wallis H test is a non parametric or one way ANOVA test which is used when data is in ranked or ordinal form. This test helps in deciding whether there is a significant difference between three or more groups of indifferent samples. The test can only be effective if it is first ranked from the lowest to the highest. These are the overall rankings of the sample values and not rankings within individual samples. All ties are given the mean of the ranking (Ebdon, 1985).

Kruskal-Wallis was used to test the hypothesis that MEAs are poorly reflected in national biodiversity policies. All the biodiversity policy scores per obligation were compiled together and then they were assigned serial numbers (1 to n). For tied ranks the rank used was the mean of the number of ties. The ranks were then redistributed to the original data. For each MEA, the ranks were added and the sum was squared to get the r^2 for each group. The test statistic H is then calculated using Equation 4-7.

$$H = \frac{12}{N(N+1)} \sum \frac{R^2}{n} - 3(N+1)$$

(Eq. 4-7)

where N= total number of individuals in all the samples; R= sum of the ranks within a sample; n= number of individuals in a sample [and $\sum \frac{R^2}{n}$ = sum of all the values of $\frac{R^2}{n}$].

In this test when the N in the computed H statistics is greater than 5, the result becomes a Chi square. If the computed Chi was greater than the critical Chi square, then the null hypothesis was rejected. On the other hand if computed Chi square was equal to or less than the critical Chi square, then the null hypothesis was not rejected. The Kruskal-Wallis H test is similar to the test used by the research done by WWF (2004) to show the reflection of PAs in various regions of the world.

4.5.2.3.2 Chi-square test

The Chi-square test procedure tabulates a variable into categories and computes a chi-squares statistic. This goodness-of-fit test compares the observed and expected frequencies in each category and is a non parametric test. The test summarizes the discrepancy between the observed and the expected values. To use the Chi-square test, the data must be nominal and assumed to be a random sample. The expected frequencies from each category must be at least 1. No more than 20% of the categories should have expected frequencies of less than 5 and observations must be independent of each other (Ebdon, 1985). The Chi-square statistic is computed using the formula in Equation 4-8.

$$x^2 = \sum \frac{d^2}{e} \quad (\text{Eq. 4-8})$$

where x^2 = symbol for Chi-square, d = the difference between observed and the expected frequency for each category and e = the expected frequency for each category.

The Chi-square test is a technique of measuring significance of association between two variables. It cannot measure the strength of relationships between variables under consideration (*ibid*). The Chi-squares, a test of independence was used to test the hypothesis that there is no difference between the local people's MEA awareness with the distance from the MEA conservation areas. The variables considered were MEA awareness and distance. The Chi was used to show whether there was any association between the two variables. This is similar to Vodouhê *et. al.*'s (2010) research where the chi was used to test the hypothesis that there is no difference between people's perception about biodiversity awareness and education.

4.5.2.3.3 Paired t-test

The Paired t-test is used to evaluate the significance of difference between paired values. It is a parametric test and applicable to data which is normally distributed, the variance of the two samples is equal, the cases are independent of each other and only matched pairs can be used to perform this test (Field, 2009). The paired t-test is calculated using the formula shown in Equation 4-9.

$$t = \frac{\bar{d}}{\sqrt{s^2/n}} \quad (\text{Eq. 4-9})$$

where \bar{d} = mean difference, s^2 = sample variance, n = sample size and t is a student t quantile with $n-1$ degrees of freedom.

The Paired t-test was used to test the hypothesis that there is no difference in the typology of threats affecting the domestication and application of biodiversity MEAs in Kenya. To show the difference between institutional and community-based threats, the threats between the institutions and communities were listed and then ranked based on the threats of the highest order. They were then paired according to the threats. The ranked threats which were at nominal levels were tested for statistical significance using this test. This is similar to the work of Dickman (2008) who used the Paired t-test to test the difference in the level of conflict between villages where human attacks from carnivores had occurred and those where they had not occurred.

4.5.2.3.4 Coefficient of determination r^2

Coefficient of determination r^2 was used to show the association between the dependent variable of MEA awareness and the independent variables namely gender, residence period near the MEA sites, distance from households to MEA sites and level of education. The coefficient of determination r^2 is a measure of association and shows which variable is dependent on which. It shows the strength of the linear association between the x and y and the percentage that is closer to the best fit line (Ebdon, 1985). The formula for computing r^2 shown in Equation 4-10.

$$r^2 = \frac{s_{\bar{y}}^2}{s_y^2} \quad (\text{Eq. 4-10})$$

where the r^2 is the coefficient of determination, $s_{\hat{y}}^2$ is the variance of the predicted values of the dependent variable and s_y^2 is the variance of the observed values of the dependent variable. When there is a perfect fit, the predicted values are the same as the observed values so that the $s_{\hat{y}}^2$ and the s_y^2 are identical thus, giving an r^2 of 1.0. If the fit of regression is less than perfect, there are differences between predicted and observed values, and $s_{\hat{y}}^2$ is less than s_y^2 , giving an r^2 of less than 1.0.

CHAPTER FIVE

INTEGRATION OF BIODIVERSITY MEAS IN NATIONAL POLICIES

5.0 INTRODUCTION

In order to integrate biodiversity MEAs in national management, all countries need to address relevant obligations in national policies and legal frameworks. These obligations are all based on the three pillars of sustainable development which are environmental protection, social development and economic growth. Kenya has taken good measures in order to integrate biodiversity MEAs in national policies (Annex 3). This chapter highlights how MEA integration has been undertaken in the country through domestication in national biodiversity policies.

5.1 MEA OBLIGATIONS

The five biodiversity MEAs considered in this study have 56 obligations, which Kenya should integrate in order to ensure sustainable biodiversity management. Each MEA has a different number of obligations including 17 for the CBD, 10 each for CITES, CMS and Ramsar Convention and 9 for the WHC. This is shown in Table 5-1. The obligations were selected based on the objectives of this research.

Table 5- 1: MEAs and national obligations

MEA	National obligations
CBD	1. Conservation, sustainable use and equitable sharing of biodiversity (Article 1)
	2. Identification of threats and monitoring status of biodiversity and habitats (Article 7)
	3. Cooperation amongst countries in biodiversity usage and conservation (Article 5)
	4. Developing national strategies, plans and programmes for conservation (Article 6a)
	5. Integrating biodiversity into relevant sectoral and cross sectoral plans, programmes and policies (Article 6b)
	6. <i>In-situ</i> conservation through PAs (Article 8a)
	7. Prevention of alien species (Article 8h)
	8. Innovation, integration of indigenous knowledge and involvement of local communities (Article 8j)
	9. <i>Ex-situ</i> conservation (Article 9)
	10. Cooperation between government and private sector in the sustainable use of bioresources (Article 10)
	11. Research and training for conservation and sustainable use of biodiversity (Article 12)
	12. Implementation of CoP decisions (Article 23)
	13. Public participation, education and awareness (Article 13)
	14. Minimizing impacts on biodiversity with EIAs (Article 14)
	15. Access to genetic resources for equitable sharing through patent and intellectual property rights (Article 15)
	16. Exchange of technology, scientific, socio-economic and indigenous research results (Article 17)
	17. Handling and distribution of biotechnology and distribution of benefits (Article 19)
Total	17 Obligations
CITES	1. Listing of endangered species in the right Annexes (Article 2)
	2. Regulating trade in endangered species (Article 3)

MEA	National obligations
	3. Granting of licenses for trading of biodiversity products (Article 6a)
	4. Penalizing prohibited trade (Article 8.1)
	5. Details of traded species, including exporters and importers (Articles 8.6a & b)
	6. Annual progress report to Secretariat (Article 8.7a)
	7. Biennial report to show measures of enforcement (Articles 8.7a & b)
	8. Formation of a management authority to authorize trading permits (Article 9.1a)
	9. Formation of a scientific authority to check on species numbers (Article 9.1b)
	10. Cooperation between countries (Article 13)
Total	10 Obligations
CMS	1. Conserving migratory species by restoring and protecting habitats (Article 2.1)
	2. Cooperation with countries to support research of migratory species (Article 2.3)
	3. Enduring to agreements covering conservation of migratory species (Article 5)
	4. Listing of and providing immediate protection to endangered migratory species in Annex 1 (Article 3)
	5. Designation of a national authority to implement agreements and conventions (Article 5.4c)
	6. Coordination of conservation through policies and management plans (Article 5.5b)
	7. Prevention of alien species (Article 5.5e)
	8. Providing new wildlife habitats for migratory species (Article 5.5g)
	9. Removing threats to migratory corridors and migratory species (Articles 5.5h & i)
	10. Community involvement, public awareness and education on the aims of the Convention (Article 5.5n)
Total	10 Obligations
Ramsar Convention	1. Designation of wetlands for inclusion in the List of Wetlands of International Importance (Article 1.1)
	2. Conservation, wise use and management of wetlands and migratory stocks of waterfowl (Article 1.6)
	3. Formulation and implementation of plans to promote conservation and wise use of wetlands (Article 3)
	4. Research, monitoring and exchanging of data and training (Articles 4.3 & 4.5)
	5. Increasing waterfowl population in wetlands without altering wetlands (Article 4.4)
	6. Consultation and cooperation between countries (in case of shared wetlands), communities and other stakeholders through education, public participation (Article 5 {Amended at CoP 7 in 1999})
	7. Representatives to CoPs to be trained experts in wetlands/waterfowl management (Article 7)
	8. Parties to inform IUCN of every change in the ecological character of wetlands (Articles 3 & 8)
	9. Regular reporting on conservation, management and wise use of wetlands and biodiversity (Article 6)
	10. Establishing natural reserves on wetlands (Article 4)
Total	10 Obligations
WHC	1. Identifying, protecting and conserving natural heritage (Article 4)
	2. Adopting policies and plans aimed at natural heritage (Article 5a)
	3. Developing scientific and technical (research) support for heritage protection (Article 5c)
	4. Setting national/regional centres for training personnel in conservation/protection (Article 5e)
	5. Submitting inventory of property on national heritage to World Heritage Committee (Article 11)
	6. State to encourage formation of private foundations to collect donations for heritage conservation (Article 17)
	7. Educational and awareness programmes to appreciate culture in natural heritage (Article 27)
	8. Submission of CoP reports (Article 29)
	9. Cooperation between countries and involvement of local communities (Articles 6 & 7)
Total	9 Obligations

Source: MEA secretariats

5.1.1 Domestication of MEA obligations through integration in national policies

Each MEA is expected to be integrated in a set of national biodiversity policies through prescriptions related to the MEA obligations as indicated in Annex 4. The National Constitution of

Kenya (GoK, 2010) is the mother of all policies and has considered natural resources, including biodiversity. Chapter Five of the constitution deals with land and environment and Part 2, Article 69, deals with the environment and natural resources where all biodiversity MEAs are supposed to be considered. In addition to these, a number of thematic policies have been formulated. The Wildlife Policy (GoK, 2012f) is a very important document which covers all MEAs. For the CBD, this policy has taken into consideration its Obligation 1 on conservation, sustainable use and equitable sharing of resources, which are clearly articulated in Chapters 4 and 5 on management of PAs, and in Chapter 11 on *ex-situ* conservation and incorporation of wildlife in all sectors. Similarly, Chapters 4 and 5 on conservation and management of PAs have integrated the CITES obligations on conservation of endangered species. The other areas of CITES domestication include, Chapters 6 and 7 on conservation, management and research; Chapter 8 on wildlife management and Chapter 10 on institutional management. Similarly, for the CMS, Chapters 4, 5, 6, 7 and 8 address a wide range of obligations in relation to the migratory species and their habitats while Chapter 8 on wildlife management and Chapter 11 on wetland education and awareness address the Ramsar Convention Obligation 2 on conservation, wise use and management of wetlands and waterfowl as well as Obligation 6 on educational and awareness programmes. Others include Chapter 3 of the Wildlife Policy on guiding principles and values; Chapters 4, 5, 6, 7, 8 and 9 of which the latter being on institutional framework, take the WHC's obligations into consideration.

The Sessional Paper No. 6 on Environment and Development (GoK, 1999b) is another important policy covering the obligations of the biodiversity MEAs. It was developed soon after the CBD was ratified and is focused on fulfilling all the CBD obligations. Article 4 of the Sessional Paper is on environment and development which deals with issues on protecting biodiversity from negative impacts; Article 7 deals with the provision of education and awareness on biodiversity issues while Article 9 is on sustainable development and biodiversity protection. The CITES obligations are poorly covered in this policy with Article 4 on environment and development, Article 8 on environmental laws and Article 10 on the judiciary as the few areas of national integration. For the CMS, Article 4 on environment and development and Article 7 on public awareness and education address some of its key obligations such as Obligation 6 on conservation through policies and management plans and Obligation 10 on public awareness, education and community involvement in biodiversity management. Articles 4 and 7 of the Sessional Paper also take into consideration

community involvement, education and awareness of wetland issues in line with the Ramsar Convention, while Article 4 captures the country's natural heritage aspect for the WHC obligations.

Another policy which has attempted to integrate biodiversity MEAs is the Draft Environment Policy (GoK, 2013a) where Section 4 on ecosystems management and sustainable use of natural resources takes into consideration the CBD and the WHC obligations. Similarly, Sections 4 and 8 have considered the national obligations for the CITES, CMS and Ramsar Convention especially on issues concerning environmental governance. Section 7 on education and awareness has integrated the CMS's Obligation 10 and Ramsar Convention's Obligation 6 on public awareness, education and community involvement.

The National Wetlands Conservation and Management Policy (GoK, 2015) addresses the obligations of the CBD, CMS, Ramsar Convention and the WHC. In Chapter 2, the policy addresses the CBD's Obligation 1 on conservation, sustainable use and equitable sharing of resources. This Chapter is also in line with the CMS's Obligation 1 on conserving migratory species by protecting habitats and Obligation 8 on providing new habitats for migratory species. The policy considers the Ramsar Convention obligations with Chapter 1 integrating issues on management and conservation through various strategies including education; Chapter 2 on challenges and strategies of wetland conservation and management; Chapter 3 on legal and institutional management while Chapter 4 has attempted to integrate issues concerning sectoral links at national and institutional levels. For the WHC, Chapters 1 and 3 of the Wetland Policy have considered the WHC obligations on institutional and legal frameworks for wetlands which have religious and cultural significance while Chapter 2 has covered the obligations on natural heritage.

Another important policy catering for the CBD, CITES and the CMS is the Oceans and Fisheries Policy (GoK, 2008) where section 2 integrates issues on challenges and opportunities of fisheries management, Section 4 on cooperation with other States and Section 5 on sustainable utilization of the fisheries. The CITES and the CMS obligations on international cooperation and education are considered in Sections 4 and 5. Similarly the Draft ICZM Policy (GoK, 2007a) addresses the CBD, CITES and the CMS obligations. This policy which deals with marine and coastal biodiversity management has integrated the CBD and CMS through its Section 2 on critical ecosystems and

habitats, Section 3 on mangrove forests, Section 4 on coastal forests, Section 5 on sea bed grasses, Section 6 on deltas and estuaries, Section 7 on marine PAs (MPAs), Section 8 on species of special concern, Section 9 on fisheries, Section 12 on community issues and Section 14 on access and benefit sharing. The CITES is covered briefly in Sections 7 and 8.

The CBD, CITES and the WHC are integrated in the Forest Policy (GoK, 2014). For the CBD the policy has considered the obligations on sustainable use, education, stakeholder participation and public-private partnerships. Other areas of integration in the Forest Policy include Objective 3 on forest user rights and Objective 11 on cooperation which also caters for the CITES while Objective 11 partially caters for the WHC obligation on conserving natural heritage.

The National Policy on Culture and Heritage (GoK, 2009c) has attempted to integrate the CBD and WHC obligations in Kenya. For the CBD its Chapter 2 on culture and heritage is focused on heritage conservation. The integration of WHC obligations are reflected in Chapter 1 which deals with the role of the government in conserving natural heritage, Chapter 10 on capacity building, Chapter 12 on funding and Chapter 13 focuses on institutional and administrative framework. The Land Policy (GoK, 2009b) has also tried to integrate the CBD's Obligation 4 on developing strategies, plans and programmes for conservation through its Chapter 3 on land tenure. It has also considered some key obligations for the CITES including Obligation 10 on international cooperation. The Draft Natural Resources Development and Management Policy (GoK, 2012c) integrates some of the key CBD and CITES obligations, although very shallowly. The CBD obligations are integrated in Section 4 on natural resource valuation and audit; Section 6 on principles and values and Section 10 on actions and plans. Section 10 has also attempted to integrate the CITES obligations. The overall situational analysis for the five biodiversity MEAs is highlighted below.

5.1.1.1 Convention on Biological Diversity

The domestication of the CBD in Kenya has been met through integration of international obligations in 16 national policies (Annex 3). The policy analysis showed that Kenya is trying to take good care of its terrestrial and aquatic biodiversity as directed by the number of policy prescriptions. The Sessional Paper No. 6 on Environment and Development (GoK, 1999b) had the

highest number of relevant prescriptions (75); followed by the Wildlife Policy (GoK, 2012f) (72); the Draft Environment Policy (GoK, 2013a) (44); Draft ICZM Policy (GoK, 2007a) (33); the Land Policy (GoK, 2009b), Wetlands Conservation and Management Policy (GoK, 2015) and the Forest Policy (GoK, 2014) (18 each); the National Oceans and Fisheries Policy (GoK, 2008) (16); the National Policy on Culture and Heritage (GoK, 2009c) (14); Tourism Policy (GoK, 2007b) (7); the National Policy for the Sustainable Development for Northern Kenya and other Arid Lands (GoK, 2012e) and the Policy for Disaster Management (GoK, 2009d) (6 each); the National Constitution of Kenya (GoK, 2010) (5); the Draft Natural Resources Development and Management Policy (GoK, 2012c) (4); the National Water Policy (GoK, 2012g) (3) and the Draft Fisheries Policy (GoK, 2005a) (1). This is highlighted in Annex 4.

5.1.1.2 Convention on International Trade in Endangered Species of Wild Flora and Fauna

The CITES domestication in Kenya is achieved by the integration of international obligations in 9 national policies. Policy analysis indicated that the Wildlife Policy (GoK, 2012f) had the highest number of prescriptions at 18; National Oceans and Fisheries Policy (GoK, 2008) (8); Forest Policy (GoK, 2014) (7); Draft Environment Policy (GoK, 2013a) (6); the National Constitution of Kenya (GoK, 2010), Sessional Paper No. 6 on Environment and Development (GoK, 1999b), the Draft Fisheries Policy (GoK, 2005a) and Draft ICZM Policy (GoK, 2007a) (3 each) and the National Land Policy (GoK, 2009b) had the lowest with only 1 policy prescription as shown in Annex 4.

5.1.1.3 Convention on the Conservation of Migratory Species of Wild Animals (CMS)

The CMS domestication in Kenya is undertaken through the integration of international obligations in 8 national policies. The policy analysis established that the Wildlife Policy (GoK, 2012f) had the highest number of prescriptions at 54; Draft ICZM Policy (GoK, 2007a) (31); Draft Environment Policy (GoK, 2013a) (21); Sessional Paper No. 6 on Environment and Development (GoK, 1999b) (16); Wetlands Conservation and Management Policy (GoK, 2015) (8); National Oceans and Fisheries Policy (GoK, 2008) (6); the National Constitution of Kenya (GoK, 2010) (6) and the Draft Natural Resources Development and Management Policy (GoK, 2012c) with only one prescription as documented in Annex 4.

5.1.1.4 Ramsar Convention

The Ramsar Convention domestication in Kenya is undertaken through integration of international obligations in 5 policies of which the Wetlands Conservation and Management Policy (GoK, 2015) had the highest number of prescriptions at 52; Wildlife Policy (GoK, 2012f) (17); Draft Environment Policy (GoK, 2013a) (15); Sessional Paper No. 6 on Environment and Development (GoK, 1999b) (10) and the National Constitution of Kenya (GoK, 2010) (5) (Annex 4).

5.1.1.5 World Heritage Convention

The WHC domestication in Kenya is undertaken through the integration of international obligations in 7 national policies. The policy analysis established that the Wildlife Policy (GoK, 2012f) had the highest number of relevant prescriptions at 53, Sessional Paper No. 6 on Environment and Development (GoK, 1999b) (16); Wetlands Conservation and Management Policy (GoK, 2015) (14); Draft Environment Policy (GoK, 2013a) (12); National Policy on Culture and Heritage (GoK, 2009c) (6); the National Constitution of Kenya (GoK, 2010) (5) while the Forest Policy (GoK, 2014) had only 1 prescription (Annex 4).

5.2 MEA OBLIGATION INTEGRATION AND IMPLEMENTATION ANALYSES

5.2.1 Integration and implementation of the CBD

The CBD policy analysis involved the scrutiny of 16 policies to establish how many obligations were adequately integrated. The Wildlife Policy (GoK, 2012f) and Sessional Paper on Environment and Development (GoK, 1999b) had integrated all the 17 obligations and therefore have a 100% integration level. The National Water Policy (GoK, 2012g) featured in only 5 obligations and therefore considered to have 29.4% integration level. Table 5-2 provides a summary of the integration status for the CBD in Kenya based on the list of obligations in Table 5-1.

Table 5-2 shows the 12 policies which had achieved the average category of 50%, which is very good. It shows that Kenya on the overall is above average in addressing biodiversity issues. However, this is not enough to give the real picture on the ground in terms of domestication. Additional policy prescriptions analyses were used to further analyse the domestication situation. Figure 5-1 shows the summary of CBD obligation integration in national policies. The policy analyses showed that out of the 16 policies, the Constitution of Kenya (GoK, 2010) had the highest level of policy prescription integration with a mean score of 49.4% while the lowest was the

National Policy on Culture and Heritage (GoK, 2009c) with 13%. The details of the prescriptions achieved for each obligation are shown in Annex 5A.

Table 5- 2: Summary of CBD obligation integration in Kenya

Categories		National biodiversity policies
Range	Interpretation	
90-100%	Excellent	Wildlife Policy, Sessional Paper No. 6 on Environment and Development, National Constitution of Kenya, Draft Environment Policy
70-89%	Very good	National Wetlands Conservation and Management Policy
50-69%	Good	Land Policy, National Policy for the Sustainable Development for Northern Kenya and other Arid Lands, National Oceans and Fisheries Policy, Draft Natural Resources Development and Management Policy, National Policy for Disaster Management, National Policy on Culture and Heritage, Draft ICZM Policy
40-49%	Weak	Forest Policy, Draft Fisheries Policy, Tourism Policy
39% and below	Very weak	National Water Policy

Source: Researcher

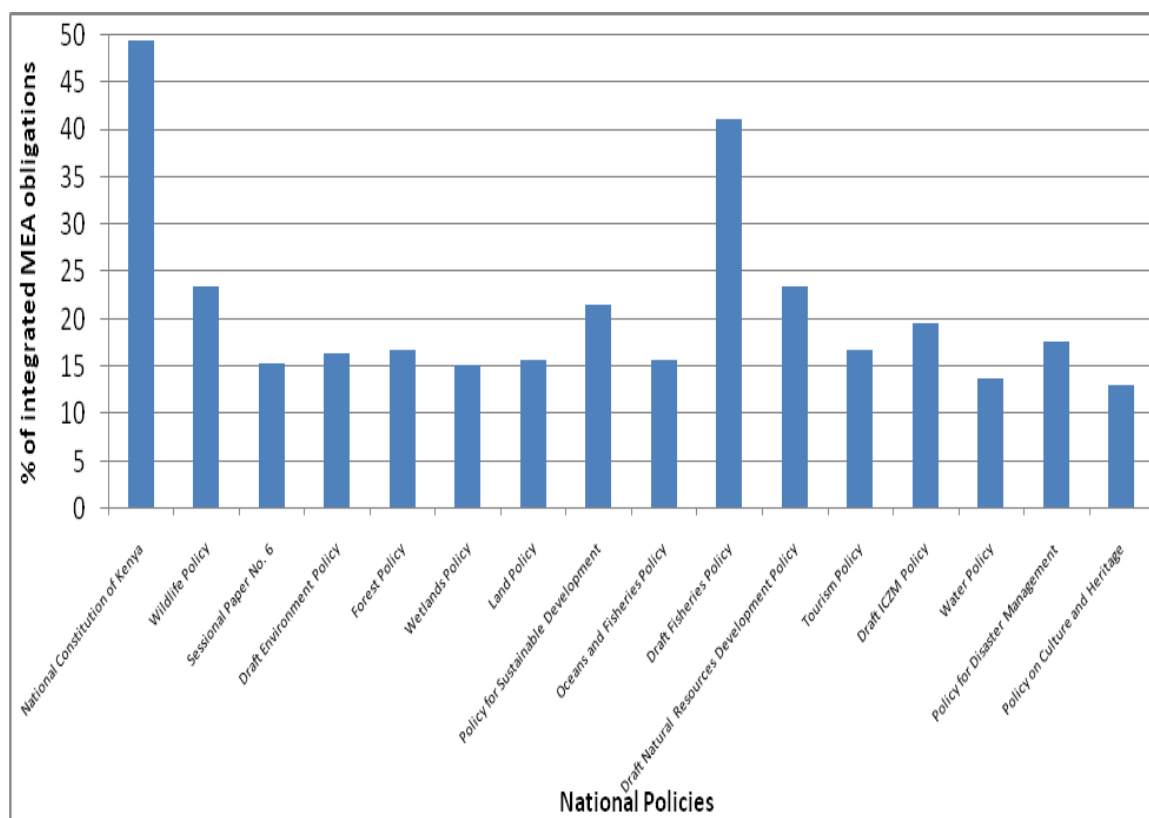


Figure 5- 1: Summary of CBD obligation integration in national policies

Source: Researcher

The policy analysis in terms of integration of MEA obligation in policy prescription showed that Obligation 1 on conservation, sustainable use and equitable sharing of biodiversity has the highest

integration level (100%) with Obligation 12 on implementation of CoP decisions having the least integration level (0.3%). The rest of the obligations obtained average levels of integration as shown in Figure 5-2.

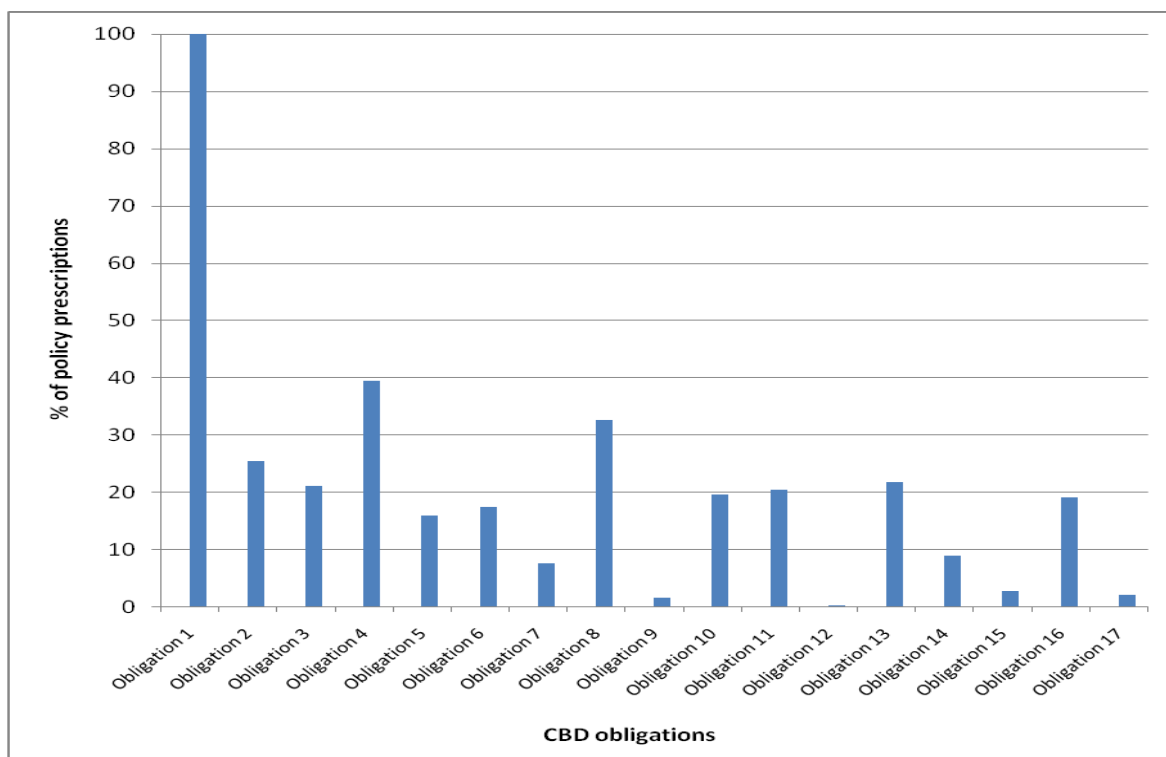


Figure 5- 2: Summary of CBD obligation integration in biodiversity policy prescriptions

Source: Researcher

Based on these analyses, the overall status of Kenya in terms of the CBD domestication was considered weak as none of the existing national biodiversity oriented policies has achieved the integration status of 50% in terms of policy direction for the MEA obligations. At the same time the average integration status of the CBD related policies is only 20.9% (Annex 5A). This indicates a poor picture of Kenya’s commitment towards achieving the CBD obligations.

5.2.2 Integration and implementation of the CITES

The CITES policy analysis involved the scrutiny of 9 national biodiversity-related policies in Kenya. The Wildlife Policy (GoK, 2012f) had integrated 8 obligations (80% integration level) while the National Land Policy (GoK, 2009b) has integrated only 2 obligations (20% integration level) (Annex 5B). Table 5-3 provides a summary of the integration status indicating that there were no policies in the category of 90-100%. This reflected that the integration status of the policies is quite weak.

Table 5- 3: Summary of CITES obligation integration in Kenya

Categories	Interpretation	Policies
90-100%	Excellent	-
70-89%	Very good	Forest Policy, Wildlife Policy
50-69%	Good	National Oceans and Fisheries Policy, Draft, Draft Environment Policy, Draft ICZM Policy
40-49%	Weak	Sessional Paper No. 6 on Environment and Development, National Constitution of Kenya
39% and below	Very weak	Draft Fisheries Policy, National Lands Policy

Source: Researcher

Figure 5-3 shows the summary of CITES obligation integration in national policies. Out of the 9 policies, the Draft ICZM Policy (GoK, 2007a) has the highest level of policy prescription integration with a mean score of 42.5% while the lowest is the Draft Fisheries Policy (2005a) with only 13.3%, indicating an 86.7% integration gap (Figure 5-3). The details on the prescriptions achieved for each obligation are shown in Annex 5B.

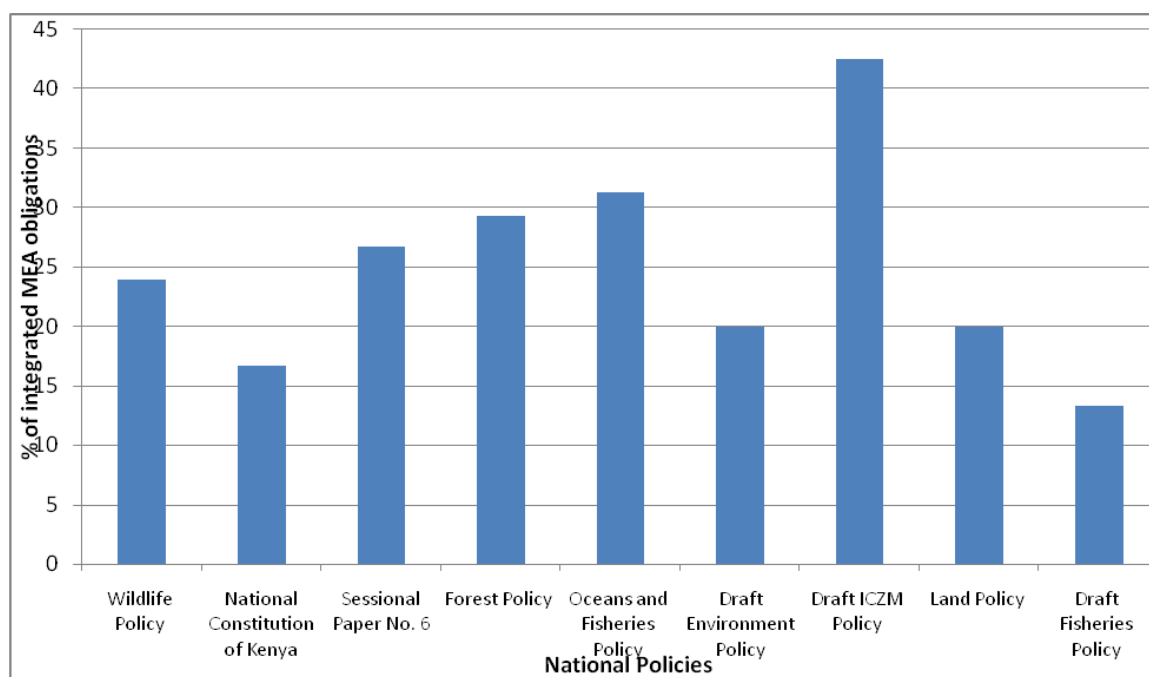


Figure 5- 3: Summary of CITES obligation integration in national policies

Source: Researcher

The analysis of the policy prescriptions showed which obligations were well documented at national level. Obligation 2 on trade regulation of endangered species has the highest integration level (68.4%), followed by Obligation 10 on international cooperation (57.4%) (Figure 5-4 & Annex

5B). The research findings indicated that Obligation 7 on biennial report of enforcement measures is not reflected in any prescriptions. The rest of the obligations obtained very low levels of integration as shown in Figure 5-4.

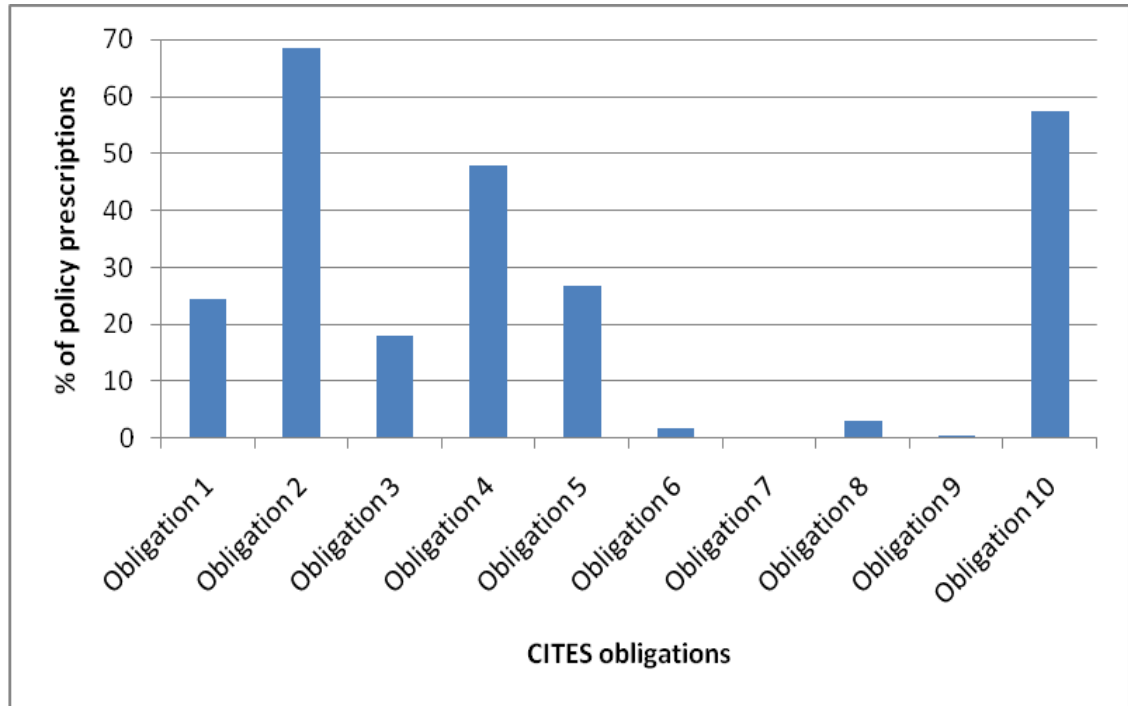


Figure 5- 4: Summary of CITES obligation integration in biodiversity policy prescriptions

Source: Researcher

Based on these analyses, the overall status of Kenya in terms of the CITES domestication is considered weak as none of the policies has achieved an integration status of 50% in terms of alignment with the MEA obligations. At the same time the average integration status of the CITES policies is only 24.8% (Annex 5B). This indicates a bleak picture of Kenya's commitment towards achieving the CITES obligations.

5.2.3 Integration and implementation of the CMS

The CMS policy analysis involved the scrutiny of 8 national policies. The Wildlife Policy (GoK, 2012f) and the Draft Environment Policy (GoK, 2013a) have integrated all the 10 CMS obligations (100% integration level). However the Draft Natural Resources Development and Management Policy (GoK, 2012c) has only integrated 1 obligation (10% integration level). Table 5-4 provides a summary of the integration status for the CMS in Kenya based on the list of obligations in Table 5-1. It indicates that only 2 national policies have an integration status of 90-100% while 1 policy has

lowest integration status of 39% and below. The results reflected that the integration status of the policies is average.

Table 5- 4: Summary of CMS obligation integration in Kenya

Categories		Policies
Range	Interpretation	
90-100%	Excellent	Wildlife Policy, Draft Environment Policy
70-89%	Very good	National Constitution of Kenya, Sessional Paper No. 6 on Environment and Development, Draft ICZM Policy
50-69%	Good	National Wetlands Conservation and Management Policy, National Oceans and Fisheries Policy
40-49%	Weak	-
39% and below	Very weak	Draft Natural Resources Development and Management Policy

Source: Researcher

Figure 5-5 provides a summary of CMS obligation integration in national policies. Out of the 8 policies, the one with the highest prescription integration in terms of the obligations was the National Constitution of Kenya (GoK, 2010) which scored a mean of 36%. The Draft Natural Resources Development and Management Policy (GoK, 2012c) has a very low prescription integration status of 10%, indicating an integration gap of 90%. However, since the weak policies in terms of the integration status are still in draft form, they can still be improved if the CMS obligations are added to the policy prescriptions. The details on the prescriptions achieved for each obligation are shown in Annex 5C.

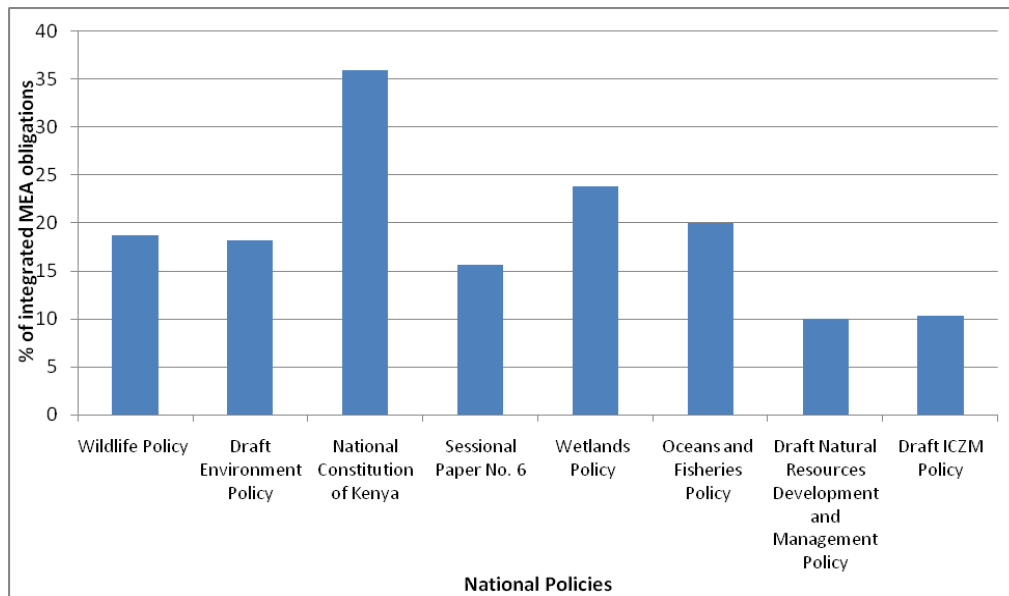


Figure 5- 5: Summary of CMS obligation integration in national policies

Source: Researcher

Furthermore, the analysis of policy prescriptions indicated the highly domesticated obligations. Obligation 10 on public awareness, education and community involvement has the highest integration status (39.1%) with Obligation 5 on designation of a national authority to implement the CMS having the lowest integration status (1.3%). The rest of the obligations also obtained poor levels of integration as shown in Figure 5-6.

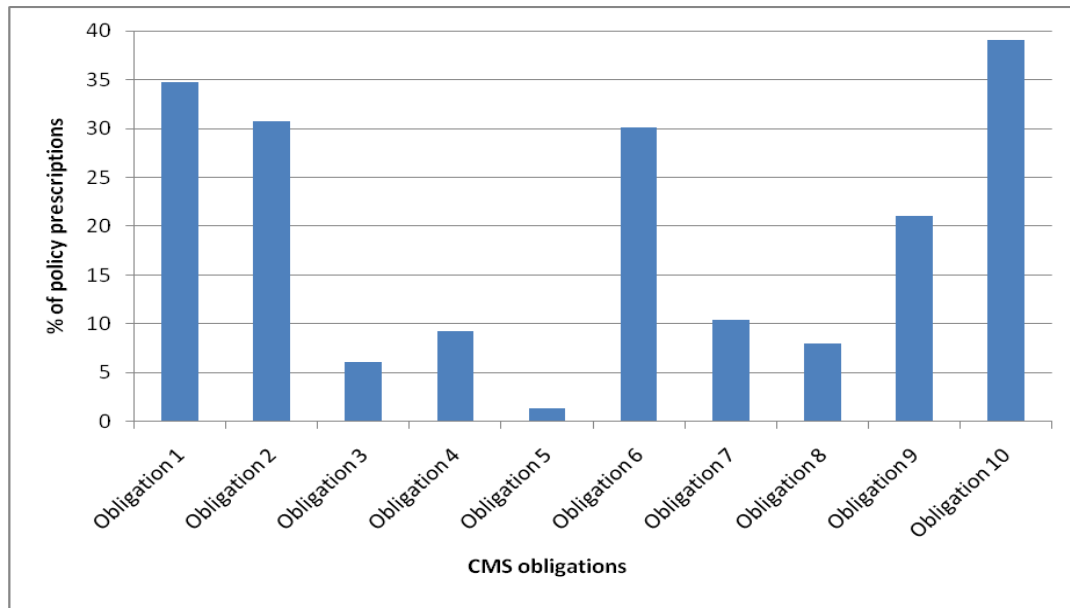


Figure 5- 6: Summary of CMS obligation integration in biodiversity policy prescriptions

Source: Researcher

Based on these analyses, the overall status of Kenya in terms of the CMS domestication is considered very weak as none of the policies has achieved an integration status of 40% in terms of alignment with the CMS obligations. This is proven by the 19.1% average integration status (Annex 5C) in terms of achieving the MEA obligations. This indicates that the future of migratory species may not be very sustainable unless Kenya works towards strengthening policies to safeguard the migratory species which are associated with the national ecosystems.

5.2.4 Integration and implementation of the Ramsar Convention

The Ramsar Convention policy analysis involved the scrutiny of 5 national policies out of which the National Wetlands Conservation and Management Policy (GoK, 2015) was found to integrate all the 10 obligations (100% integration level) while the National Constitution of Kenya (GoK, 2010) has only considered 3 obligations (30% integration level). This is summarised in Table 5-5. The general reflection is that the integration status of the policies is fairly average. The findings also

indicated that the National Wetlands Conservation and Management Policy (GoK, 2015) is fairly configured in terms of the general spirit for the Ramsar Convention. However, this is better reflected in the policy prescriptions.

Table 5- 5: Summary of Ramsar Convention obligation integration in Kenya

Categories		Policies
Range	Interpretation	
90-100%	Excellent	National Wetlands Conservation and Management Policy
70-89%	Very good	Wildlife Policy
50-69%	Good	Draft Environment Policy, Sessional Paper No. 6 on Environment and Development
40-49%	Weak	-
39% and below	Very weak	National Constitution of Kenya

Source: Researcher

Figure 5-7 shows the summary of Ramsar Convention obligation integration in national policies. The policy analysis indicated that out of the 5 policies, the Sessional Paper No. 6 (GoK, 1999b) has the highest level of policy prescription integration with a mean score of 20%. The rest of the policies have received less than 20% integration status. The expectation of the Ramsar Convention is that the National Wetlands Conservation and Management Policy (GoK, 2015) would be the outstanding policy with the highest prescription integration but unfortunately it has the lowest integration status at 16.9% (Figure 5-7). The details of the prescriptions achieved for each obligation are shown in Annex 5D.

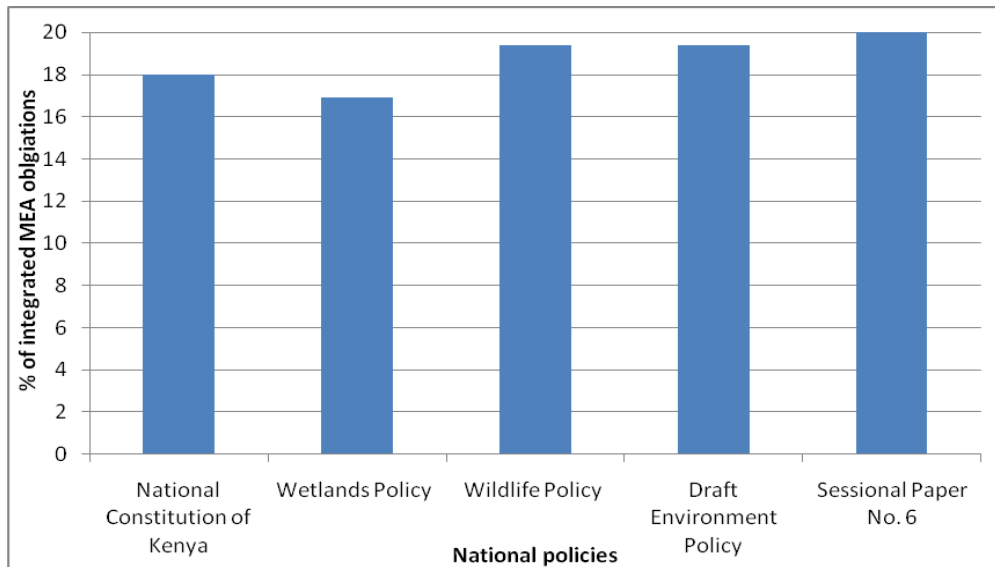


Figure 5- 7: Summary of Ramsar Convention obligation integration in national policies

Source: Researcher

The policy analysis in terms of MEA obligation in relation to policy prescriptions showed that Obligation 2 on conservation, wise use and management of wetlands and migratory waterfowl has the highest integration status (100%) while Obligation 1 on designation of wetlands for inclusion in the list of wetlands of international importance has the lowest integration status (0.78%). However although Obligation 1 has the lowest integration status, it does not mean that Kenya is not doing well in terms of designating Ramsar sites. In fact when compared to countries like South Africa which have ratified the Ramsar Convention in 1975 and has 22 sites covering 555,678 hectares; Ghana which ratified the Convention in 1988 also has 6 sites which are only 176,132 hectares in total, and Uganda which ratified the Convention in 1988 has 12 sites covering 454,303 hectares, Kenya is doing much better. Kenya, having ratified the Ramsar Convention in 1990 has designated 6 sites which are 265,449 hectares in size. The rest of the obligations obtained very poor levels of integration as shown in Figure 5-8.

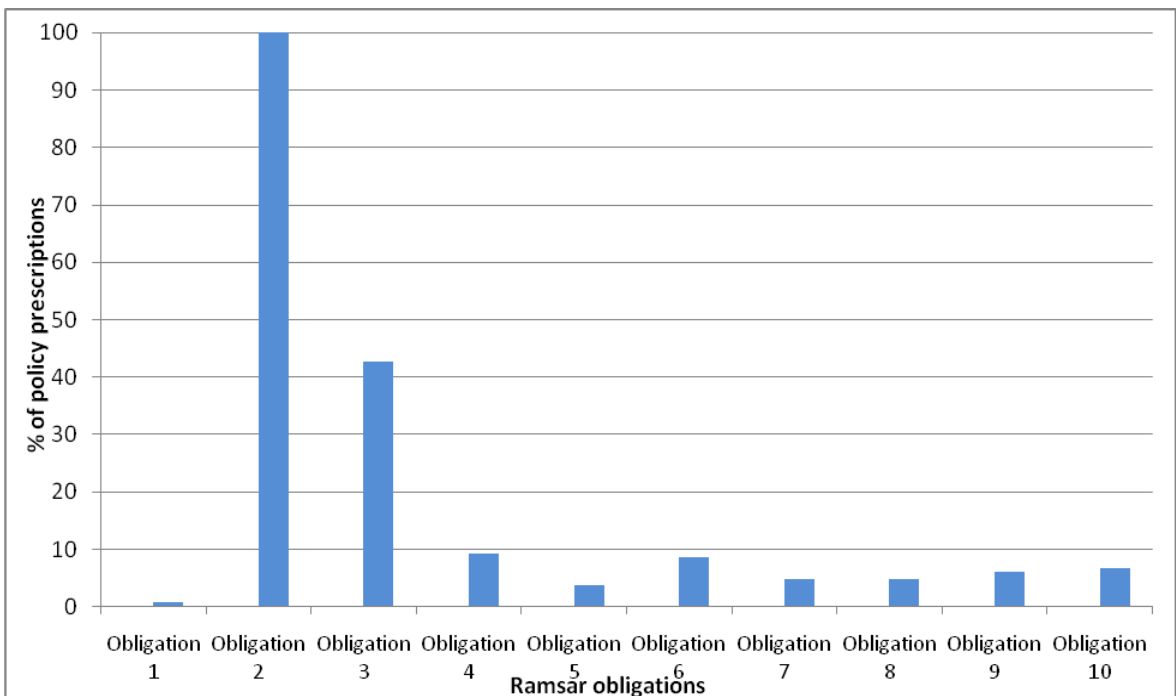


Figure 5- 8: Summary of Ramsar Convention obligation integration in biodiversity policy prescriptions
Source: Researcher

Kenya's domestication of the Ramsar Convention is weak as indicated by the 18.8% average integration level (Annex 5D) in terms of achieving the MEA obligations. This indicates that the future of Kenya's wetlands may not be sustainable. This can be improved by setting up more policies and amending the existing ones in line with the Ramsar Convention obligations.

5.2.5 Integration and implementation of the WHC

The WHC policy analysis involved the scrutiny of 7 national policies with no policy having integrated all the 9 obligations. The highest obligation integration of 7 was recorded for the National Policy on Culture and Heritage (GoK, 2009c), the Wildlife Policy (GoK, 2012f) and the National Wetlands Conservation and Management Policy (GoK, 2015) which has an integration status of 77.8%. The Forest Policy (GoK, 2014) has only domesticated 1 obligation indicating an integration level of 11.1%. This is summarised in Table 5-6. The general reflection is that the integration status of the policies is weak as reflected in policy prescriptions (Annex 5E).

Table 5- 6: Summary of WHC obligation integration in Kenya

Categories		Policies
Range	Interpretation	
90-100%	Excellent	-
70-89%	Very good	Wildlife Policy, National Wetlands Conservation and Management Policy, National Policy on Culture and Heritage
50-69%	Good	-
40-49%	Weak	Draft Environment Policy, Sessional Paper No. 6 on Environment and Development
39% and below	Very weak	National Constitution of Kenya, Forest Policy

Source: Researcher

Figure 5-9 shows the summary of WHC obligation integration in national policies and shows that out of the seven policies, the policy with the highest level of prescription integration is the National Policy on Culture and Heritage (GoK, 2009c) at 25.9% while the lowest is the Forest Policy (GoK, 2014) with an integration of 11.1%. The details of the prescriptions achieved for each obligation are shown in Annex 5E.

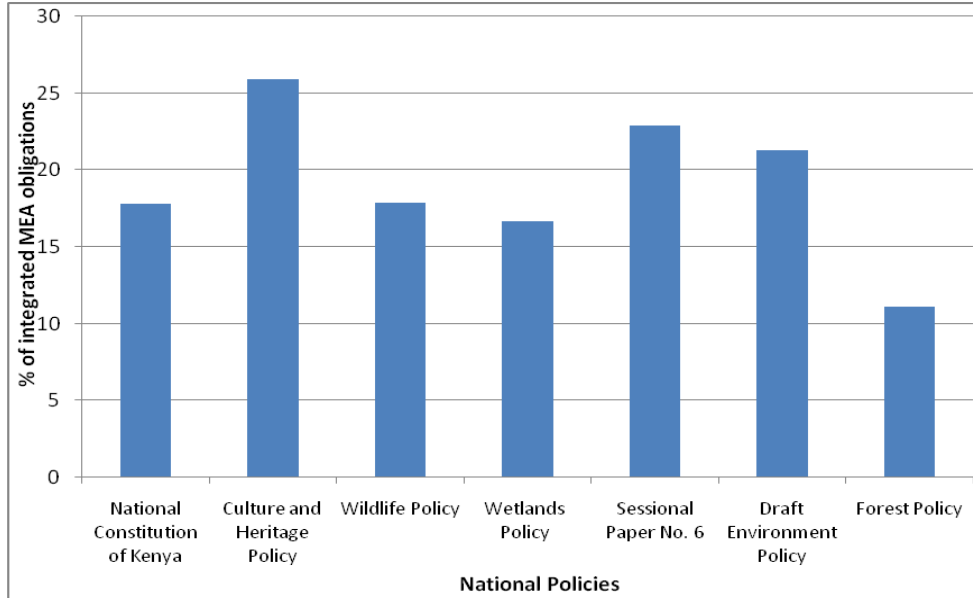


Figure 5- 9: Summary of WHC obligation integration in national policies

Source: Researcher

The policy analysis in terms of MEA obligation in relation to policy prescription showed that Obligation 1 on identifying, protecting and conserving natural heritage has the highest integration status (96.8%) while Obligation 5 on submission of national heritage inventory to the World Heritage Committee and Obligation 8 on submission of CoP reports has no integration status (Figure 5-10) indicating that these obligations are not reflected in any of the policies.

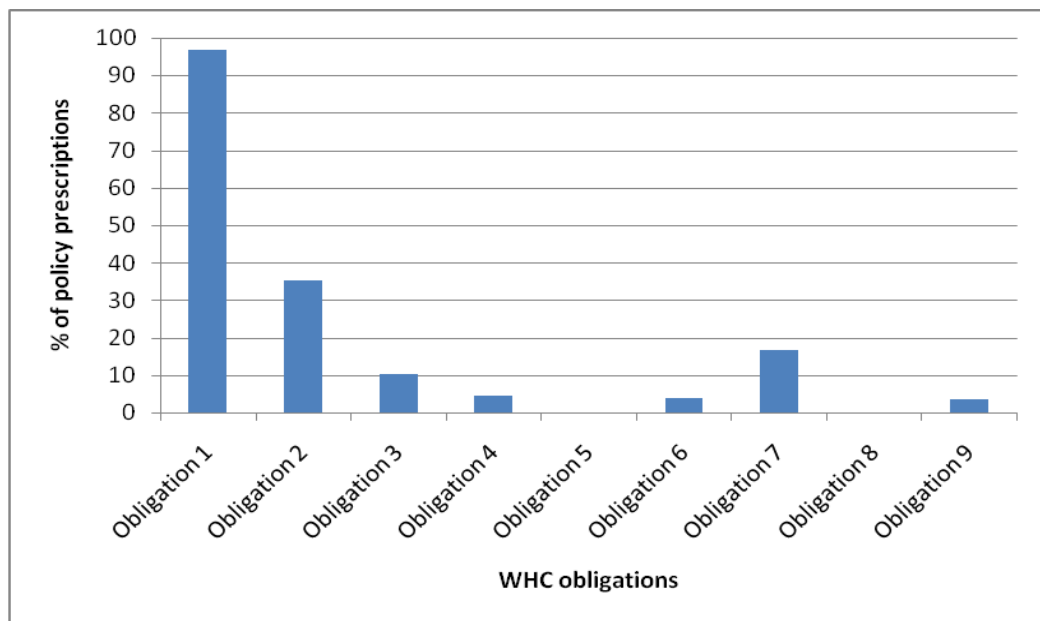


Figure 5- 10: Summary of WHC obligation integration in biodiversity policy prescriptions

Source: Researcher

Based on these analyses, the overall status of Kenya in terms of the domestication of the WHC is considered to be very weak as none of the existing national biodiversity oriented policies has achieved an integration status of more than 30% in terms of alignment with the MEA obligations. This is also supported by the 19.1% average integration level (Annex 5E) in terms of achieving the MEA obligations.

5.3 NATIONAL BIODIVERSITY POLICIES

The above findings indicated that all the five MEAs are poorly reflected in the national biodiversity policies of Kenya as the policy integration status is between 18 to 25%. For the CITES the policy integration status is 24.8% (Annex 5B); followed by the CBD at 20.9% (Annex 5A), for the CMS (Annex 5C) and the WHC (Annex 5E) at 19.1% each while integration for the Ramsar Convention is 18.8% (Annex 5D). The study findings showed that CBD's Obligation 1 (Article 1) on conservation, sustainable use and equitable sharing of biodiversity had the best integration level at 100% among all policies. For the CITES, only Obligation 2 (Article 3) on trade regulation in endangered species and Obligation 10 (Article 13) on international cooperation had an integration of above average of 50%. This is probably because trade regulation and cooperation on protection of endangered species has been taking place long before the CITES came into force. The findings further show that none of the CMS obligations has an average integration status of 50%. In the case of the Ramsar Convention, Obligation 2 (Article 1.6) on conservation, wise use and management of wetlands is reflected in all policies compared to the WHC obligations for which only Obligation 1 (Article 4) on identifying, protecting and conserving natural heritage is well reflected in all the policies.

In order to test the hypothesis that MEAs are poorly reflected in national biodiversity policies, the Kruskal-Wallis H test was used (Table 5-7).

Table 5- 7: Reflection of MEAs in national biodiversity policies

MEAs	Critical Chi	Calculated Chi	Degree of freedom (df)	Level of significance (P values)
CBD	25	28.350	15	0.000
CITES	15.51	5.744	8	0.018
CMS	14.07	12.228	7	0.000
Ramsar Convention	9.49	3.421	4	0.066
WHC	12.59	8.456	6	0.005

Source: Researcher

The results indicate that for the CBD the P value is 28.35. Since n in the computed H statistics was greater than 5, the result is a Chi square. This computed Chi square was compared with the critical value given the degree of freedom of $k-1$ at α 0.05. The results show that for the CBD, the calculated Chi is greater than the Critical value indicating that the null hypothesis is rejected and the alternative that MEAs are not poorly reflected in national biodiversity policies is accepted. This result was found to be significant as the CBD is amongst the last biodiversity MEAs signed in the recent history. For the CITES, CMS, Ramsar Convention and the WHC, there is not enough evidence to reject the hypothesis.

5.4 DISCUSSION

5.4.1 Convention on Biological Diversity

The overall domestication level for the CBD in Kenya was 20.9% (Annex 5A). From the literature reviewed, the CBD's integration status for most countries is better than that of other biodiversity MEAs. There are many factors which have contributed to this. As seen for most developing countries, most legislations are based on the CBD obligations. This is basically because the CBD was amongst the last biodiversity MEAs signed in the recent history (signed in 1992).

In order to address the CBD obligations, the member states are expected to commit themselves to achieving the Convention's Strategic Plan which was adopted in 2002 with an aim of implementing the three objectives of the CBD which are the biodiversity conservation, sustainable use of biodiversity components and the equitable sharing of benefits arising from the utilization of genetic resources. At The same time, the 2011-2020 Aichi targets are now the main instruments in encouraging countries to set up policies, plans and programmes (UNEP, 2012). These targets are yet to be achieved by most developing countries including Kenya.

The findings of this study showed that the CBD Obligation 1 on conservation, sustainable use and equitable sharing of biodiversity was the best implemented in terms of integration in national policy prescriptions (Figure 5-2 & Annex 5A). This is similar to other countries such as Madagascar (Ibisch *et. al.*, 2010), Uganda (Eilu *et. al.*, 2008), Tanzania (Emerton, 1998) and South Africa (Swiderska, 2002) where biodiversity is a key backbone for the economy in terms of food security and foreign exchange and thus, is incorporated in all biodiversity policies. It is also in line with the continuous discussions of all biodiversity conferences and conventions where emphasis is on

biodiversity protection with the concepts of benefit sharing, sustainable development, education and revenue sharing (Secretariat of the CBD, 2010). However there are other developing countries such as the Laos People's Democratic Republic where Obligation 1 is poorly reflected (Emerton *et. al.*, 2002).

The study findings showed that the CBD Obligation 8 on innovation, integration of indigenous knowledge and local community involvement in Kenya has a 32.7% integration level (Figure 5-2 & Annex 5A) which was low when compared to other developing countries. Zimbabwe, for example is amongst the best examples of community involvement in wildlife management through its Communal Area Management Programme for Indigenous Resources (CAMPFIRE). Under this programme, the landowners are free to make economic gains from wildlife as long as they maintain sustainability. The aim is to make people realise biodiversity as an asset and in turn, the financial benefits are channelled to communities in terms of schools and health facilities (Kameri-Mbote & Cullet, 2002; Secretariat of the CBD, 2010; 2014). Depicting Zimbabwe, Kenya has also begun to involve communities in wildlife management through the national biodiversity policies and already positive results are being seen (Weru, 2016). Palau has also taken good measures to involve communities in biodiversity management and on the use of indigenous knowledge (Chandra & Idrisova, 2011). Most countries have, however paid very little attention to the protection of indigenous knowledge (Kabud, 2003; Secretariat of the CBD, 2014).

Although 8% of Kenya's total surface area is currently under PAs (KWS, 2014b), this is still very low compared to the Aichi Targets which advocates that the PAs status should be 17% for terrestrial and inland waters and 10% for marine (Secretariat of the CBD, 2014). In comparison, Tanzania has at least 39.6% of its territory under the PAs status (Naughton-Treves *et. al.*, 2005; TANAPA, 2008). Elsewhere, Costa Rica has approximately 26% of the national territory under protection of which 7.19% is marine (UNDP, 2010).

The findings in this study showed that Obligation 10 on public-private cooperation in the protection and sustainable use of biodiversity is poorly integrated in Kenya's national policies (Figure 5-2 & Annex 5A). This is probably due to the traditional conservation approach where biodiversity protection was largely considered as the business of the state. This is different in countries like

Mozambique where the involvement of the private sector in conservation is advocated in the National Forestry and Wildlife Policy (Republic of Mozambique [RoM], 1999) where the private sector is involved in the management of PAs. One example is the Niassa Reserve in northern Mozambique where private investors are providing funding and training to safeguard biodiversity. This has led to the expansion of the reserve, which initially was 15,000 km² to its current size of 23,400 km² (Hatton *et. al.*, 2001).

This study also established that the national policy prescriptions for research and training as provided in the CBD Obligation 11 are limited (Figure 5-2 & Annex 5A) which is also common in other countries (Turvey, 2008; Slingenberg *et. al.*, 2009). According to the Secretariat of the CBD (2007), it was found that 70% of the national CBD reports identified scientific research and training capacity as a constraint. This was based on the fact that there were very few qualified biodiversity experts. At the same time there is also lack of specialist training programmes and other incentives due to financial constraints (CEEWEB, 2005; Secretariat of the CBD, 2014).

In terms of the CBD Obligation 14 on the need for EIA to protect biodiversity, this study established that Kenya has limited policy prescriptions at 8.9% (Figure 5-2 & Annex 5A) indicating weak policy implementation at the country level. This is due to financial constraints and limited human capacity resulting in very few prosecutions of EIA cases. The same has been found in Pakistan where, in spite of having policies and laws on EIA, implementation is poor (Swiderska, 2002). In many other countries, EIA has become part of the national obligation (OECD, 2012) and has been incorporated in the management plans. This is the case for Zambia and Zimbabwe, Morocco and Ghana (Sampong, 2004; Economic Commission of Africa, 2005).

Finally, the findings showed that CBD Obligation 7 on invasive species was very poorly reflected in the national policies (Figure 5-2 & Annex 5A) which might explain why the country has continued to suffer from a wide range of terrestrial and aquatic invasive species. Kenya has experienced a number of biological invasions, some of which have has significant consequences on socio-economic status (Keil, 1988; NEMA, 2011). Notable examples include the larger grain borer (*Prostephanus truncatus*) (Hodges *et. al.*, 1983; Muhihu & Kibata, 1985; UNEP, 2009), the water hyacinth (*Eichhornia crassipes*) (NEMA, 2011) and *Prosopis* spp. Recent reviews on invasive alien

species in the East African region have identified 34 different species that have invaded Kenya (Kedera & Kuria, 2005). This obligation is equally poorly reflected in most African countries including South Africa where 81 invasive species have been identified (UNEP, 2013). Research carried out by McGeoch *et. al.* (2010) showed that the problem of invasive species has been more severe in large countries and islands than in smaller countries due to most being landlocked (Hulme, 2008). For example New Zealand had 222 invasive species in 2010 while Equatorial Guinea had 9 (Blackburn *et. al.*, 2004; Palmer, 2006; Stohlgren *et. al.*, 2006; Hulme, 2008). However with implementation of policies on species invasions, countries like Australia and New Zealand have been able to prevent the introduction and spreading of invasive species (Secretariat of the CBD, 2014).

5.4.2 Convention on International Trade in Endangered Species of Wild Flora and Fauna

The overall domestication level for the CITES in Kenya was estimated in this study at 24.8% (Annex 5B). The findings showed that Kenya is working very hard to regulate trade in wild flora and fauna in a bid to implement Obligation 2 for CITES. According to the findings, this obligation has a high integration status of 68.4%, indicating the country's seriousness in the protection of endangered flora and fauna. Similarly, Uganda is also trying to regulate illegal trade by practising revenue sharing with the local communities living around PAs (Harrison *et. al.*, 2015). Kenya's counterpart, South Africa is equally trying hard to regulate the illegal trade but is finding it extremely hard as poaching is increasing annually as proved by the rhinos poached. In 2007, only 13 rhinos were poached; in 2011, the number increased to 448 while in 2015, the number soared to 1,175 (DEAT, 2016).

In terms of listing species in the correct CITES annex according to their status (Obligation 1), Kenya has not done well because the policy integration status for this obligation was only 24.4% (Figure 5-4 & Annex 5B), which can lead to widespread smuggling of contrabands at the country's border points. For example on 3rd December 2011, the KWS seized a large container of elephant tusks worth KShs 158 million at the Port of Mombasa which was destined for the Far East. There are increasing concerns over the busy port becoming a transit point for illegal trade, especially in endangered species (www.kws.org accessed on 13th August 2013). In terms of action, the country's Wildlife Act (2013b) has listed the species in the correct annexes which actually helps the custom officials identify species which should not be traded. Uganda, just like Kenya has a weak

integration of CITES obligations as many of the custom officials are not aware of the listing of the species in specific annexes resulting in illegal exports due to the lack of awareness (Harrison *et. al.*, 2015). This situation is common in many West African states (Ó Críodáin, 2007). For example the African Teak (*Pericopsis elata*) which is classified as endangered by the IUCN and cannot be traded from countries where it is endangered like Cameroon, Central African Republic, Congo and the DRC. However the DRC has put the species in the list of “possible concern” thus allowing trade in the species (Dickson *et. al.*, 2005). Similarly in the European Union (EU), Ó Críodáin (2007) showed the listing of endangered species in individual countries was not properly done which prevents traders from knowing whether the products they were trading in are illegal or not.

The findings in this study indicated an average level of integration for Obligation 4 on penalties on prohibited trade (Figure 5-4 & Annex 5B). This is not similar to other African countries such as the RoSA where a study by Warchol (2004) showed that poachers if caught, pay heavy monetary fines which are three times the value of the animal involved and can face up to ten years imprisonment. However, very few poachers are caught as the products are quickly passed across the borders (Warchol, 2004). Elephant ivory is, for example cut into small pieces and the rhino horns are easily hidden and exported across international borders.

While countries like the UK and Kenya have been struggling to domesticate the CITES obligation of penalizing prohibited trade by developing stricter national measures, countries like Portugal do not have national laws (Laursen, 2007). In the EAC, Kenya has tough laws and is more effective in enforcing them in comparison to Tanzania where corruption outweighs legalisation of laws (Spencer & Slabbert, 2010; Weru, 2016).

The findings in this study also indicated that the integration of Obligation 3 for the CITES which is related to the granting of licenses was very weak (Figure 5-4 & Annex 5B) which is similar in other African countries. In South Africa, fishermen require licenses for trading in endangered species. Each fisherman has a limit to what one can harvest. However, they go beyond their limits and get away which is an indication that the problem is due to implementation and enforcement of policy and legal frameworks. The main fish poached and declared as endangered is *abalone* (*Haliotis kamtschatkana*), a marine shell fish which is a common delicacy in Asia, especially China, Hong Kong and Taiwan (De Greef & Raemaekers, 2014) where it fetches over US\$ 320 per piece

(International Network for Environmental Compliance and Enforcement [INECE], 2008). In other countries like Cameroon, it is easy to get trading permits for endangered species products including ivory because sport hunting is allowed and after an animal's death, its products can be traded provided one has the Certificate of Origin (Stiles & Martin, 2001).

These findings in this study showed that Obligations 8 and 9 on formation of management and scientific authorities has low policy integration status (Figure 5-4 & Annex 5B). The integration of Obligation 8 on the formation of management authority was 3.1% while that for Obligation 9 on the formation of scientific authority was 0.6%. However, the institutional support to implement CITES obligations have been quite successful in the country. By 2005, plans were in place to certify biodiversity products (GoK, 2005d). According to the KWS CITES office, the certification of biodiversity products has already started. This is expected to help in tracking the origins of illegal items like ivory. One example is of ivory consignment seized at the Port of Mombasa in July 2013. When the DNA tests were done, it showed that it originated from the African savannah ecosystems of southern Africa (www.kws.org accessed on 13th August 2013).

5.4.3 Convention on the Conservation of Migratory Species of Wild Animals

The overall domestication level for the CMS in Kenya was 19.1% (Annex 5C). This is in agreement with studies conducted by various scholars namely Campbell and Hofer (1995), Lombard (1995), Woodroffe and Ginsberg (1998), Homewood *et. al.* (2001), Thirgood *et. al.* (2004) and Cherney (2011) who have established that the conservation of migratory species is very difficult and expensive as it involves large network of PAs, including trans-national conservation areas. Studies by various scholars (Williamson & Williamson, 1984; Fryxell & Sinclair, 1988; Bekenov *et. al.*, 1998) show that migratory wildlife are better sustained in large PAs as their habitats are better conserved. According to the 2005 CMS report (UNEP, 2005a), the strategies for the conservation of migratory species were quite weak in many countries. The CMS report considered forty-seven countries including Kenya, DRC, Nigeria, South Africa, Pakistan, Argentina, Bolivia, Australia, Portugal and the UK.

The implementation of the CMS obligations in Kenya and Tanzania can be compared in the Mara-Serengeti ecosystem within which a globally spectacular migration occurs every year. Studies have shown that the Tanzanian migratory wildlife is better protected in the Serengeti ecosystem

(Maddock, 1979; Murray, 1995; Wilmshurst *et. al.*, 1999; Wolanski *et. al.*, 1999; Thirgood *et. al.*, 2004; Ogutu *et. al.*, 2011). This is because the only land use in the core area is wildlife tourism while the buffer zones are associated with community conservancies where tourism and livestock keeping take place. Statistics show that the population of migratory wildebeest remained high in the Mara-Serengeti ecosystem until the 1980s but decreased from 119,000 in 1980 to 22,000 in 1997 (75% decline) due to agricultural expansion in Kenya around the Maasai Mara (Ottichilo *et. al.*, 2001; Serneels & Lambin, 2001a, b & c). According to Ogutu *et. al.* (2011), almost half of the Mara-Serengeti ecosystem has been lost to agriculture especially large scale wheat farming, resulting in the decline of migratory species. There are many other examples of transboundary conservation areas besides the Serengeti across Africa which hold migratory species. In southern Africa, migratory species are better safeguarded due to policies which have advocated for transboundary conservation areas. For example, the Government of Mozambique has established the Limpopo transboundary area, which includes the Kruger National Park.

5.4.4 Ramsar Convention

The overall domestication level for the Ramsar Convention in Kenya was 18.8% indicating a serious weakness in obligation integration (Annex 5D). However, in terms of individual obligation implementations Kenya seems to be doing well in certain areas especially Obligation 2 on conservation, wise use and management of wetlands and migratory waterfowl which has an integration status of 100% which indicates a serious commitment by Kenya for the protection of wetlands. This result is similar to Uganda which had begun to implement this obligation as early as 1993 through its wetlands policies (Bowman, 2002).

Obligation 3 on formulation and implementation of plans to promote conservation and wise use of wetlands was found to have an integration status of 42.8% (Figure 5-8 & Annex 5D). According to a report on the assessment of implementation of wetlands' management plans which compared the state of wetland governance in Africa, Kenya was found to be doing well in implementing wetland management policies and plans (Gawler, 2009). From the period of 2003 to 2007, Kenya implemented policies and plans by carrying out eighty-six wetland management activities in collaboration with communities living around wetlands. This was the highest number of activities in Africa and was also attributed to the funding support provided by the Netherlands Government through the KWS National Wetlands Programme. Other continents such as France implemented

386 activities while India conducted 219; Mexico 92 activities; Peru 81 and Australia (Oceania) 55 activities. These activities included site visits, educational activities, conferences, workshops, wetlands' rehabilitation and restoration, site designations, wetland research and policy launching (Gawler, 2009).

In terms of the integration and domestication of the Ramsar Convention Obligation 1 on wetland designation, the findings in this research established a weak integration of 0.78% (Figure 5-8 & Annex 5D). Currently Kenya has six designated Ramsar sites namely lakes Nakuru, Naivasha, Bogoria, Baringo and Elementaita and the Tana River. The country has the capacity to have more sites designated. Kenya is doing well in terms of designating Ramsar sites compared to many other countries as it ratifies the Convention in 1990 and till date has designated 6 sites which are 265,449 hectares in size unlike South Africa which ratified the Convention in 1975 and has 22 sites covering 555,678 hectares; Ghana which ratified it in 1988 and also has 6 sites which are only 176,132 hectares in total, and Uganda which ratified the Convention in 1988 and has 12 sites covering 454,303 hectares. In comparison countries like Botswana, Uganda, Guinea, Italy and UK have designated a higher number of Ramsar sites which are well prescribed in their relevant policies (Bowman, 2002).

5.4.5 World Heritage Convention

The overall domestication level for the WHC in Kenya was 19.1% indicating a weak implementation of most convention obligations (Annex 5E). However the findings established that the integration of WHC Obligation 1 on identifying, protecting and conserving natural heritage has a high integration status of 96.8% (Figure 5-10 & Annex 5E) because the country has identified and protected its valued natural heritage by setting up over 60 national parks and reserves (NEMA, 2011). Under the WHC, the country has a total of 6 world heritage sites including 4 natural sites, namely Mt. Kenya – the country's first designated WHC site (1997) based on its natural heritage value, Lake Turkana National Park prehistoric site designated in 1997 due to its historical, cultural and natural heritage value, sacred Mijikenda Kaya Forests designated in 2008 due to their cultural and natural heritage and the Great Lakes Circuit of lakes Elementaita, Bogoria and Nakuru, which were designated in 2011 due to their natural heritage. In comparison to Kenya, Tanzania has designated four natural sites under the WHC, namely the Ngorongoro Conservation Area – the first to be designated in 1979, Selous Game Reserve, Serengeti and Kilimanjaro National Parks. This indicates that

Kenya's commitment towards the implementation of Obligation 1 is much stronger than its Tanzanian counterpart.

The findings in this study showed that Kenya has tried to implement Obligation 2 on adopting policies and plans aimed at sustainable management of the natural heritage (Figure 5-10 & Annex 5E). A good number of WH sites in Kenya have area based management plans. In comparison to Kenya, several world heritage sites in eastern and southern Africa are being managed without approved and published management plans (UNESCO, 2001). Like South Africa, Kenya has made some efforts towards the domestication of WHC Obligation 6 based on public-private partnerships. A good example is found in the Mara Conservancy where the African Parks Network, an NGO is working together with the Narok County in order to protect the Mara ecosystem. Similarly the government has continued to encourage the establishment of community and private conservancies around the country. There are now over hundred and fifty (150) of such conservancies in the country especially in Laikipia, Samburu, Kajiado and Narok Counties and comprise of 4% of Kenya landmass (Weru, 2016).

5.5 SUMMARY

The Kenyan scenario shows that the policy integration status for the five biodiversity MEAs under this study was very similar, with CITES ranking top with 24.8% (Annex 5B), CBD at 20.9% (Annex 5A), CMS (Annex 5C) and the WHC (Annex 5E) at 19.1% each and Ramsar Convention having the lowest integration status at 18.8% (Annex 5D). This means that Kenya's integration of global biodiversity MEAs is still very weak and more work needs to be done in terms of both domestication and implementation. In comparison, other countries have been more successful.

CHAPTER SIX

INSTITUTIONAL INTEGRATION OF BIODIVERSITY MEAS

6.0 INTRODUCTION

This chapter highlights the findings on the institutional capacity for the implementation of biodiversity related MEAs in Kenya including the strengths and weaknesses of biodiversity management focal institutions. This was considered at two levels, namely a) lead national focal institutions and b) MEA site institutions. The key issues considered in the analysis were capacity status for implementation of biodiversity MEAs, including human capital, infrastructure and funding. This study considered twenty MEA national and site focal institutions' respondents (Tables 4-3 and 4-4). The highest representation was for the Ramsar Convention at 25% with the least for the CMS at 15% (Figure 6-1).

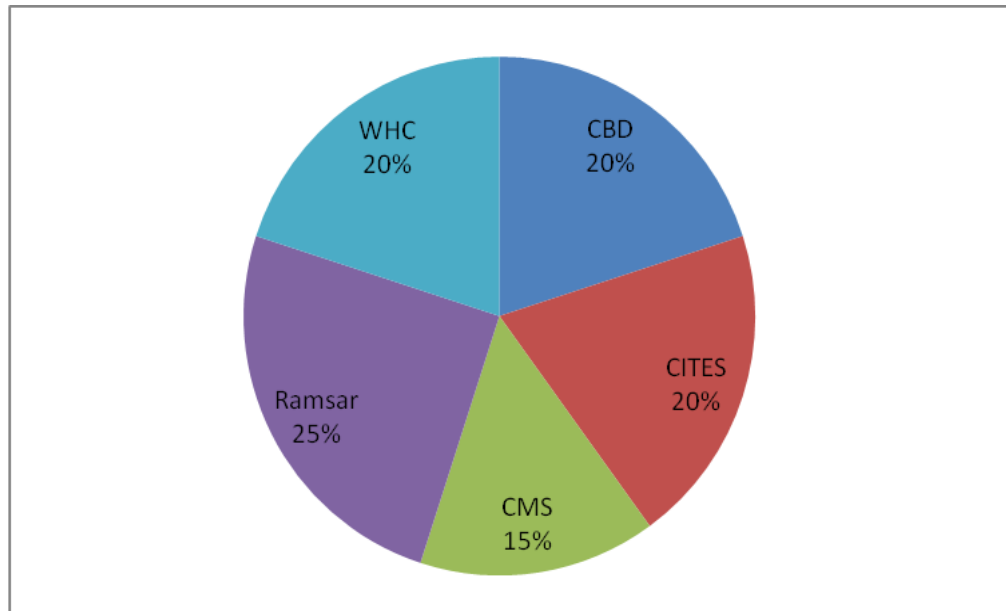


Figure 6- 1: MEA institutional respondents

Source: Researcher

6.1 NATIONAL MEA FOCAL AND SITE INSTITUTIONS

The 5 biodiversity MEAs are managed in Kenya by different national institutions and lead agencies, namely the KWS, MEWNR (MEMR), NMK and KFS. The MEA sites were characterised by 2 focal institutions, namely KWS and KFS. The assessment of the national focal and site-based institutions showed that KWS was in-charge of most MEAs followed by the KFS, NMK and MEWNR (Figure 6-2).

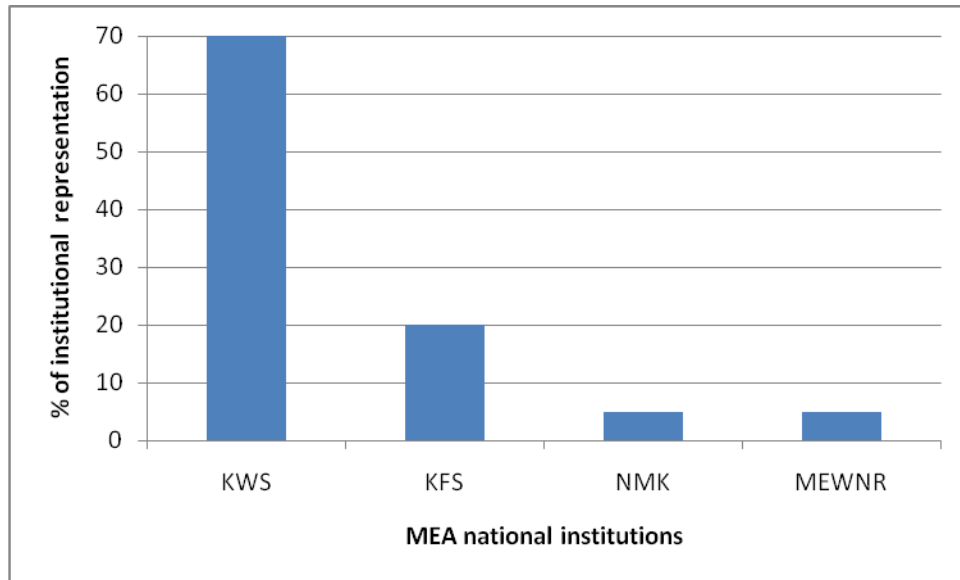


Figure 6- 2: MEA lead institutions

Source: Researcher

KWS in-charge of the implementation of three MEAs, namely the CITES, CMS and Ramsar Convention, the MEA sites of MMNR, JKIA, Port of Mombasa, Namanga, Lake Nakuru National Park, Lake Bogoria National Reserve and the regional offices at Lake Naivasha and Mt. Kenya National Park’s Nanyuki office. The KFS was the second lead institution responsible for MEA implementation in the site offices of Arabuko Sokoke Forest, Njoro region of Lake Nakuru and the Mt. Kenya Forest Reserve office in Embu. The MEWNR and the NMK were the minority as they were the MEA national focal institutions for the CBD and WHC respectively. The two institutions did not have any site offices in the study areas but were responsible for the respective MEAs throughout the country.

6.2 INSTITUTIONAL CAPACITY

The institutional capacity for the MEA national focal and site institutions was considered in terms of the number of personnel (human capital), training, funding, vehicles and information and communication technology (ICT).

6.2.1 Personnel

In terms of personnel for the national focal offices, the WHC’s national focal office at the NMK had the highest number of MEA personnel of 7, while the CITES focal office at the KWS had the lowest number of personnel of 2 (Figure 6-3). This indicates a serious challenge in KWS’s capacity based

on the fact that it is in-charge of 3 MEAs in the country and these MEAs namely the CITES, CMS and the Ramsar had the lowest personnel numbers each.

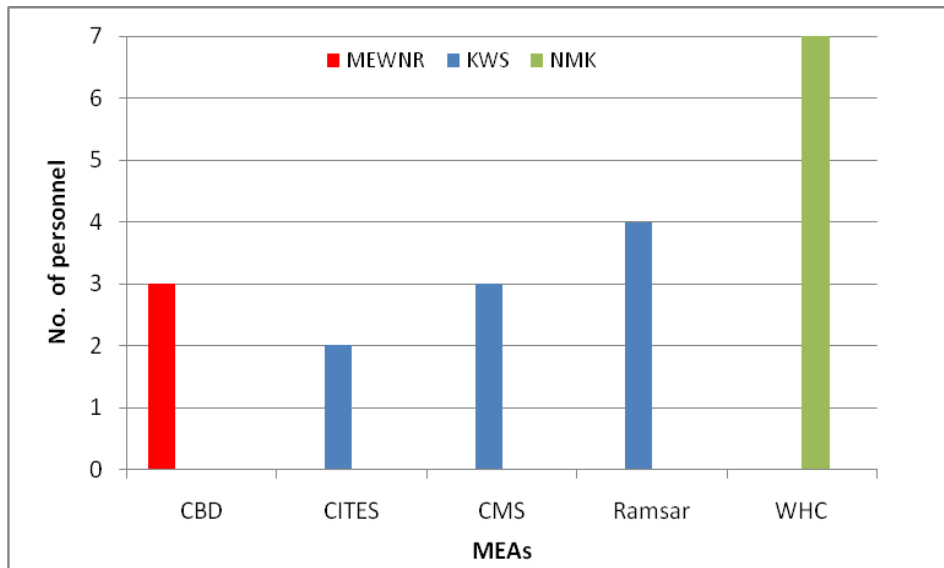


Figure 6- 3: Personnel at national focal institutions

Source: Researcher

At the MEA site institutions the personnel were from two institutions, namely KWS and KFS. The highest number of personnel was for the CITES at 30 in the ports of entry and exit, for which the KWS was in-charge. The CMS had the lowest site personnel of 9 (Figure 6-4). For the five biodiversity MEAs, the KWS had the highest number of personnel for the CITES, CMS and Ramsar at the site institutions which totalled 93, while the KFS had the lowest at 28 for the CBD and WHC.

When comparing the personnel between the MEA national focal and site institutions, the KWS had the highest number of staff of 102. This is because the KWS was the dominant focal institution for three MEAs and had their offices at most MEA sites compared to other national focal institutions. The KFS though not a focal institution, had the mandate to safeguard forests and was therefore common in the CBD and WHC site offices both within and outside the national forest reserves.

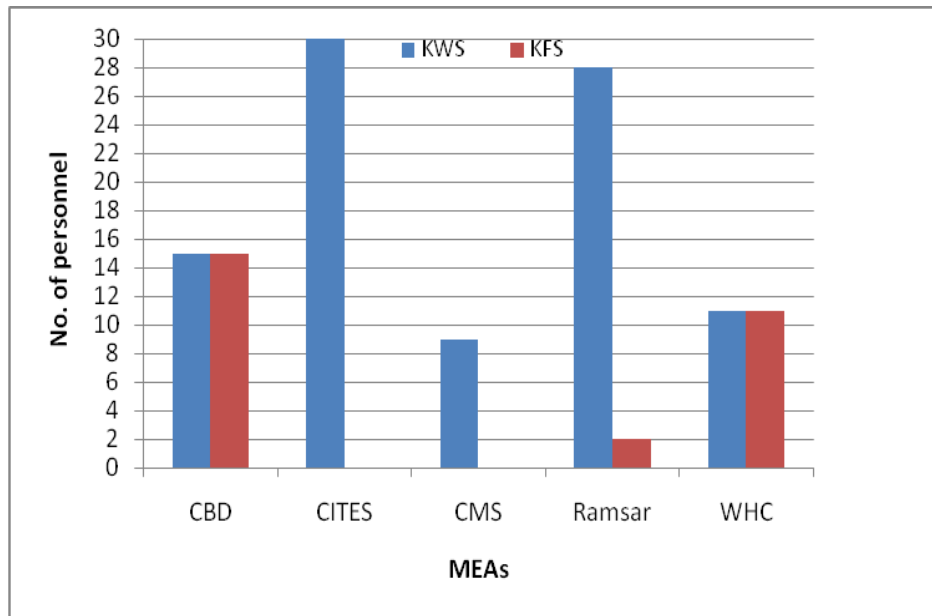


Figure 6- 4: Personnel at MEA site-based institutions

Source: Researcher

6.2.1.1 Personnel training

In terms of the level of education, all the 5 MEA focal institutional staff had university degrees in their professional lines of training. At the MEA site level it was found that the majority of respondents (13) had university degrees (Figure 6-5). The overall results indicated that 9 respondents had bachelors' degrees while 8 had masters' degrees and 1 had a PhD. Only 2 personnel had no university degrees but had done diploma in environmental education. Figure 6-5 clearly shows that KWS and KFS had the most highly trained personnel for the MEA implementation.

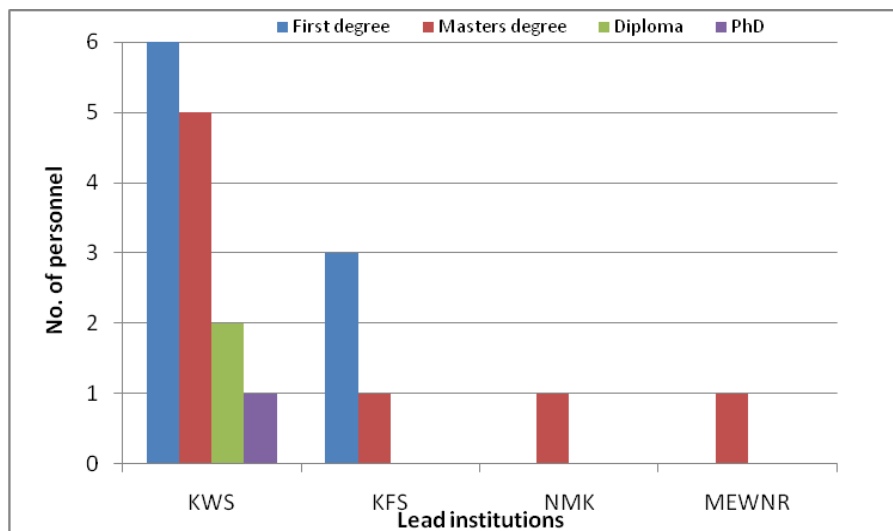


Figure 6- 5: Educational qualifications of institutional respondents

Source: Researcher

6.2.1.2 Working duration

In order to gauge the MEA level of work experience, the study established that majority of the MEA personnel (70%) had worked for a period of 6-10 years while 25% had worked for over 10 years and 5% for less than 5 years (Figure 6-6). The fact that the majority of MEA personnel had worked for 6-10 years, was an indication that they had adequate experience in their specialized jobs supporting the implementation of biodiversity MEAs in the country. Furthermore, Figure 6-6 clearly indicates that the KWS personnel had the highest level of experience in biodiversity MEA implementation in the country.

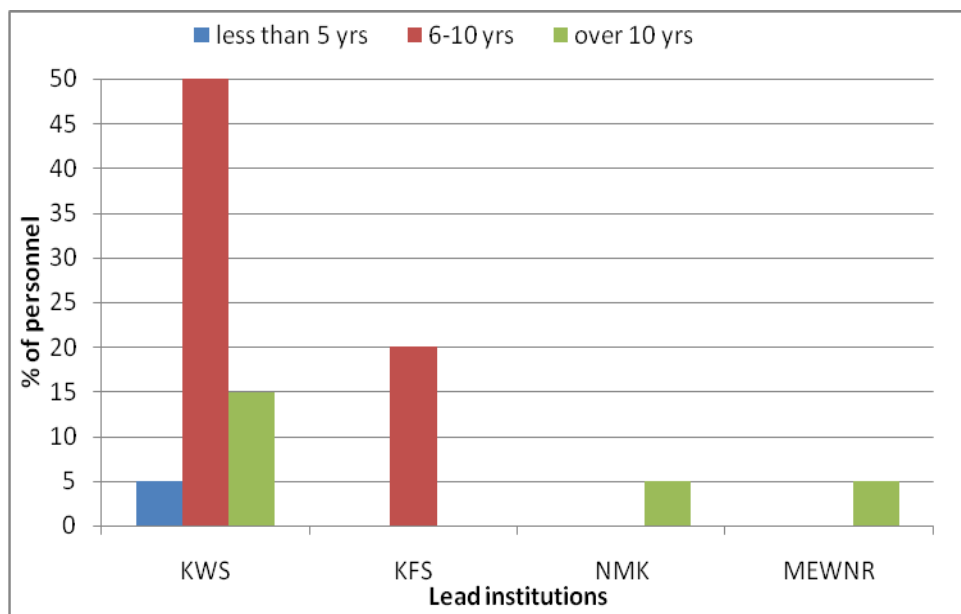


Figure 6- 6: Length of working duration for the institutional staff

Source: Researcher

6.2.2 Funding

In terms of funding, the respondents indicated that there was an annual budget allocated to their institutions for the implementation of the MEAs within their mandate. The findings showed that the CMS had the highest annual funding at approximately US\$ 100,000 while the CBD had the lowest annual funding at approximately US\$ 15,000 (Figure 6-7).

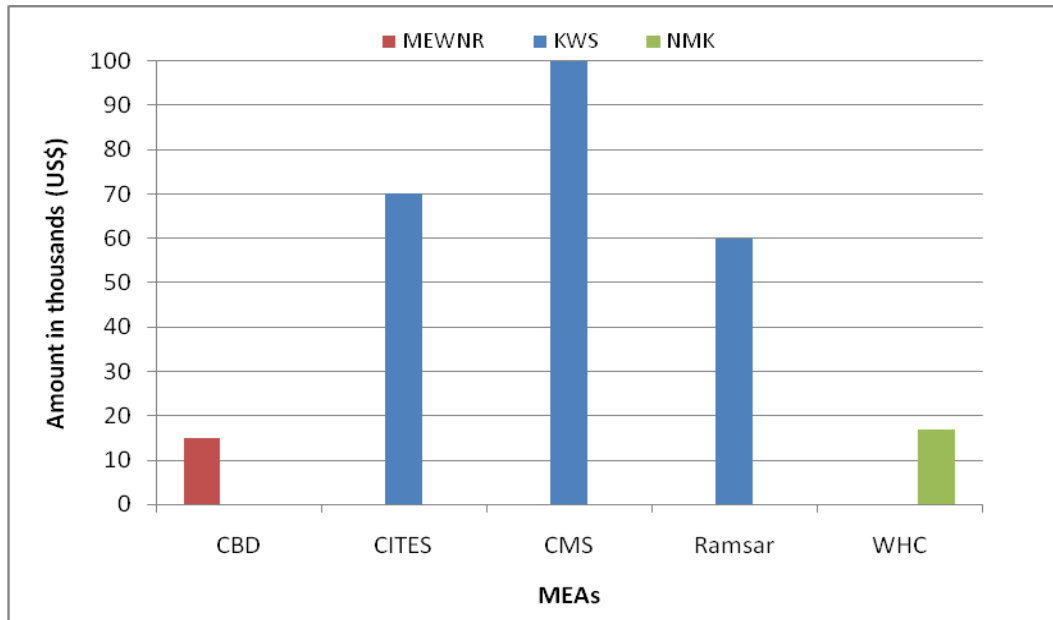


Figure 6- 7: Institutional funding per MEA

Source: Researcher

6.2.2.1 Funding agencies

There were a total of four funding institutions for the implementation of biodiversity MEAs, namely the GoK, NGOs, bilateral/multilateral donors and UN agencies. The biodiversity NGOs were found to be the major source of funding (Figure 6-8) and these included the IFAW, ACC, AWF, WWF, Wetlands International, Kenya Forests Working Group, Birdlife International and Wildlife Conservation Society and Wildlife Direct amongst others.

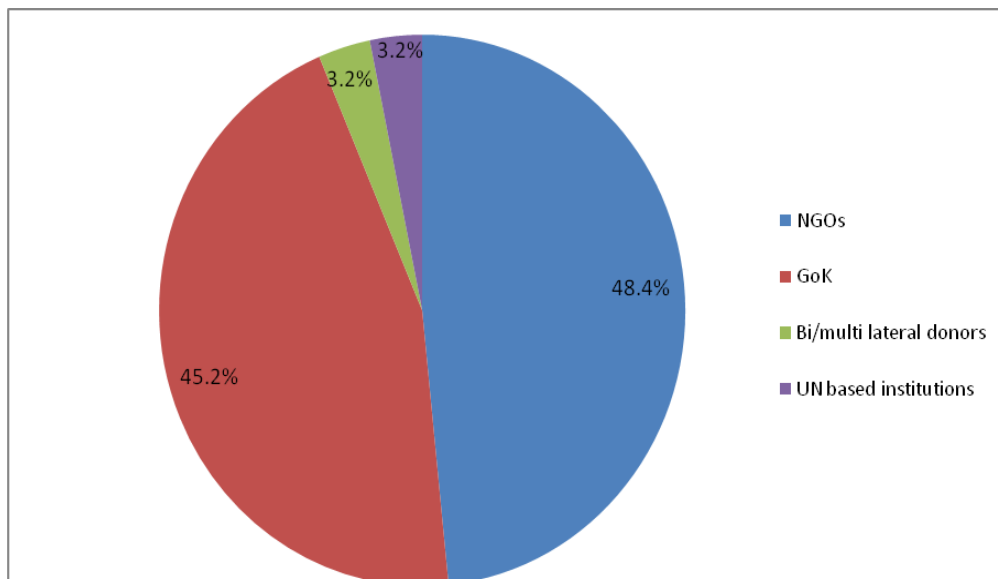


Figure 6- 8: Funding bodies for MEA institutions

Source: Researcher

The biodiversity MEA implementation funding institutions were further fragmented according to their contributions to both the national focal and site-based institutions as shown in Figure 6-9.

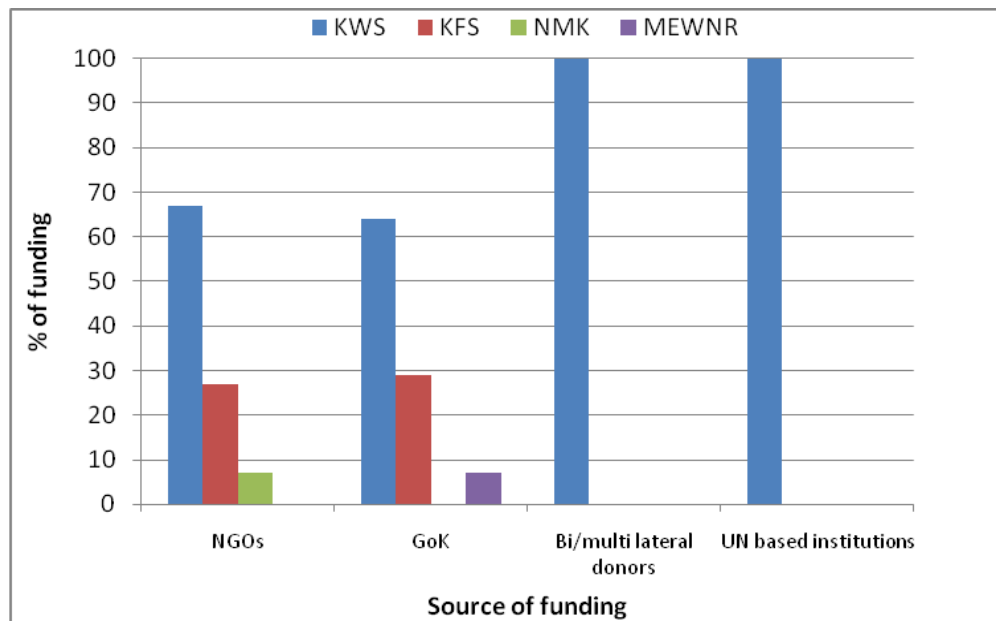


Figure 6- 9: Funding bodies in relation to MEA institutions

Source: Researcher

The biodiversity related NGOs funded two national focal institutions, namely the KWS for the CMS and Ramsar Convention and the NMK for the WHC, with the highest funding going to KWS. The NGOs also funded site-based institutions namely Arabuko Sokoke Forest under the KFS was funded by A Rocha Kenya and lakes Naivasha and Bogoria National Reserve were funded by WWF, IUCN, Wetlands International and Birdlife International. The GoK was funding the KWS (CITES, CMS and Ramsar Convention), the MEWNR (Njoro, Arabuko Sokoke Forest and Mt. Kenya National Reserve; Lake Nakuru and Mt. Kenya National Park, JKIA, Port of Mombasa and Namanga sites). The bilateral donors included the USAID, EU and the Government of Japan who funded the KWS (CMS and Ramsar Convention) while the UN-based agencies, namely GEF and the UNDP also funded the KWS (Ramsar Convention).

On the overall, the Ramsar Convention was getting support from all funding agencies while the CMS was supported by three agencies (GoK, NGOs and bilateral donors). The funding for the CBD, CITES and the WHC mainly came from single institutions. For the CBD and the CITES, it

mainly came from the GoK while for the WHC, it came entirely from the NGOs. The MEA sites were mostly funded by the GoK and biodiversity NGOs.

6.2.3 Transport

The study established that most of the national focal institutions did not have MEA allocated vehicles at their disposal for the implementation of MEA business but instead, practised vehicle pooling. In most cases KWS practiced vehicle pooling for the CMS and the CITES while the Ramsar Convention had 3 vehicles reserved for the MEAs. In fact, vehicle pooling by KWS is a new strategy aimed at combating poaching. The NMK, in-charge of WHC also practised vehicle pooling while the MEWNR which is responsible for the CBD had 7 vehicles. The results show that only the CBD and the Ramsar Convention had vehicles allocated specifically for MEA work.

At the MEA sites, the findings showed that KWS and KFS offices had vehicles with the KWS having the largest fleet of 26 vehicles. The difference in the vehicle numbers was because most of the MEA study sites were managed by KWS and very few by KFS.

6.2.4 Information Communication and Technology

The assessment of ICT capacity at the MEA national focal points and site-based institutions indicated that at the national focal institutions, the MEWNR (CBD) had the highest number of computers with the KWS CITES office having the lowest as shown in Figure 6-10.

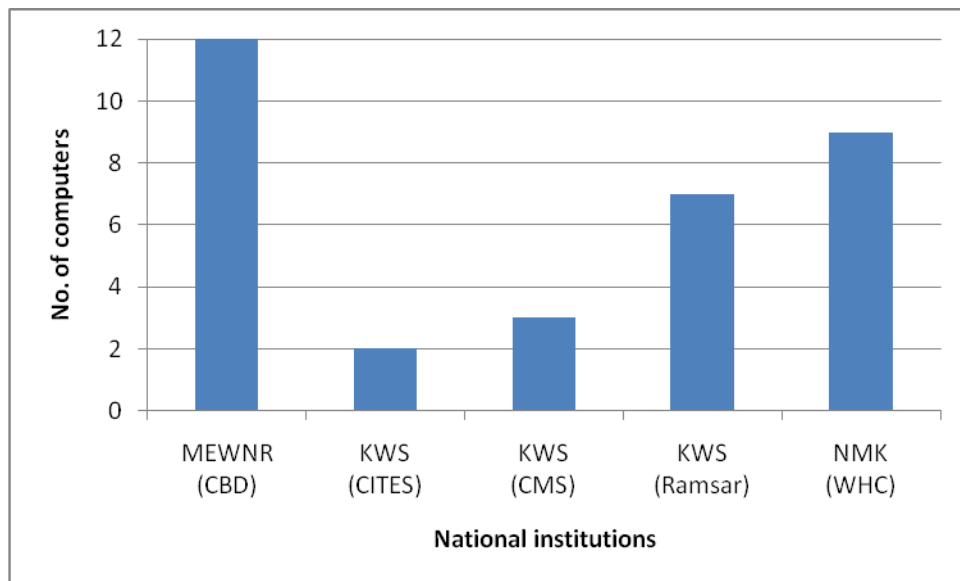


Figure 6- 10: ICT capacity of MEA national focal institutions

Source: Researcher

In terms of the MEA site-based offices, KWS was found to have the highest number of computers (39). This again is because most of the study site offices were under KWS.

The overall institutional capacity analysis showed that the Ramsar Convention had the best ICT capacity, followed by the CBD while the CITES, CMS and WHC had average capacity as shown in Table 6-1.

Table 6- 1: Institutional capacity for MEA national focal institutions

	CBD		CITES		CMS		Ramsar Convention		WHC	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1.Personnel		X		X		X		X		X
2.Education	√		√		√		√		√	
3.Working duration	√		√		√		√		√	
4.Funding		X	√		√		√			X
5.Vehicles	√			X		X	√			X
6.ICT	√			X		X	√		√	
Total	4	2	3	3	3	3	5	1	3	3
%	66.7	33.3	50	50	50	50	83.3	16.7	50	50

Source: Researcher

6.3 IMPLEMENTATION OF MEA OBLIGATIONS AT INSTITUTIONAL LEVEL

Out of 56 obligations, 15 (26.8%) were found to be cross-cutting the biodiversity MEAs as shown in Table 6-2 while 6 were overlapping, namely a) cooperation between countries, b) research and training, c) submission of CoP and annual reports, d) biodiversity conservation, e) reducing threats on biodiversity and f) *in-situ* conservation in the five MEAs. Three obligations, namely, a) development/coordination of policies/strategies/plans, b) involvement of communities and c) education and awareness were overlapping in four biodiversity MEAs. Based on their cross-cutting nature, these 15 overlapping obligations were identified as excellent yardsticks for comparing the level of domestication for biodiversity MEAs in different institutional focal points. The 15 obligations are highlighted in Table 6-2 and the comparative analysis for each obligation is presented below.

Table 6- 2: Overlapping obligations in the five biodiversity MEAs

	Cross-cutting obligations	Specific MEA articles				
		CBD	CITES	CMS	Ramsar Convention	WHC
1	Cooperation between countries	Article 5	Article 13	Article 2.3	Article 5	Articles 6 & 7
2	Research and training	Article 12	Article 9.1b	Article 3	Articles 4.3 & 4.5	Article 5e
3	CoP/annual reports	Article 23	Articles 8.7a & b	Article 5	Article 6	Article 29
4	Biodiversity conservation	Article 1	Article 3	Article 2.1	Article 1.6	Article 4
5	Reducing threats on biodiversity	Article 14	Article 2	Articles 3, 5.5 e, h & i	Articles 1.1 & 3	Article 5a
6	<i>In-situ</i> conservation	Article 8a	Articles 2 & 3	Articles 2.1 & 5.5g	Article 4.4	Article 4
7	Development/coordination of policies/strategies/plans	Article 6a	X	Article 5.5b	Article 3	Article 5a
8	Involvement of communities	Articles 8j & 13	X	Articles 5.5b & n	Article 5	Articles 5a, 6 & 7
9	Identifying threats	Article 7	X	Articles 5.5h & i	Articles 3 & 8	X
10	Education and awareness	Article 13	X	Article 5.5n	Article 5	Article 27
11	Information exchange	Article 17	X	X	Articles 4.3 & 4.5	X
12	Prevention of alien species	Article 8h	X	Article 5.5e	X	X
13	Formation of managing authority	X	Article 9.1a	Article 5.4c	X	X
14	Cooperation between government/private sectors	Article 10	X	X	Article 5	Article 17
15	Listing of endangered species	X	Article 2	Article 3	X	X

Note: X indicates that the cross-cutting obligations are not featuring in the respective MEA.

Source: Researcher

6.3.1 Cooperation between countries

In all the five MEAs, the respondents of the national focal and site-based institutions indicated that there was full cooperation (100%) between neighbouring countries in terms of sharing biodiversity to conduct research and protect transboundary ecosystems. The overall indication is that both the national MEA focal and the site-based institutions have been very effective in terms of coordination between the countries Kenya shares its biodiversity with.

6.3.2 Research and training

A total of 18 (90%) respondents indicated that there was adequate MEA-based training in Kenya. This was further cross-checked with the lead institutions in order to find out which institutions and the study established that two respondents from the KWS indicated that there was no training while all the respondents from the KFS, NMK and the MEWNR stated that there was adequate training for the personnel on site.

6.3.3 Conference of Parties and annual reporting

All the national MEA focal institutions have an obligation to report to the MEA secretariat on regular basis. These institutions get their information from the MEA site institutions. A total of 10 (66.7%) MEA site-based respondents indicated having contributed to such reports (Figure 6-11). All the MEA focal institutions indicated that they had been submitting their CoP reports as required to the MEA verified and this was with the MEA secretariats.

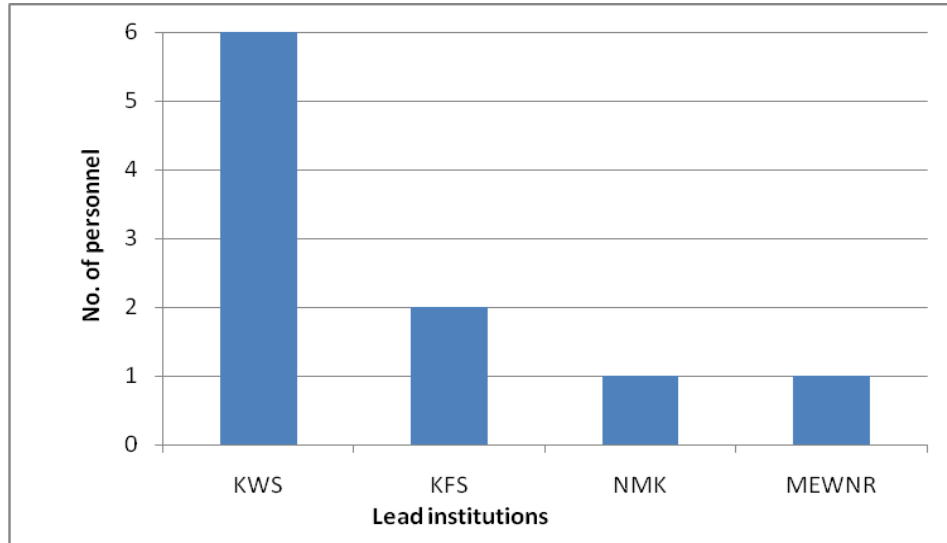


Figure 6- 11: Submission of annual reports

Source: Researcher

6.3.4 Biodiversity conservation

All MEA institutional respondents (100%) indicated that they were able to safeguard biodiversity from all kinds of threats in their respective MEA sites. However in reality this is not true as many natural forest reserves under KFS have been known to be facing high levels of deforestation.

6.3.5 Reducing threats on biodiversity

The CBD, CMS and the WHC had obligations which were aimed at identifying threats to biodiversity. The respondents identified a total of eleven priority threats for the CBD and CMS and twelve threats for the Ramsar Convention, as shown in Tables 6-3, 6-4 and 6-5.

Table 6- 3: CBD threats

Threats	MEA national institution	MEA site institutions	
	MEWNR (CBD)	KFS (Arabuko Sokoke Forest)	KWS and KFS (L. Nakuru including Njoro)
	Rank	Rank	Rank
Climate change	1	4	6
Invasive species	2	5	5
Water pollution	3		2
Development projects	4		
Hostile communities	5		3
Poaching	6	1	7
Illegal harvesting of wood	7	2	1
Bush meat poaching	8	3	
Trophy hunting	9		
Poisoning of wildlife	10		
Fire			4

Source: Researcher

Table 6- 4: CMS threats

Threats	MEA national institution	MEA site institutions	
	KWS (CMS)	KWS (Lake Bogoria)	KWS (MMNR)
	Rank	Rank	Rank
Climate change	1		2
Development projects	2		1
Invasive species	3	2	5
Water pollution	4		3
Poisoning of wildlife	5		4
Poaching	6	3	6
Illegal harvesting of wood	7		
Bush meat poaching	8	1	
Trophy hunting	9	5	7
Hostile communities	10	6	
Fire		4	

Source: Researcher

Table 6- 5: Ramsar threats

Threats	MEA national institution	MEA site institutions		
	KWS (Ramsar Convention)	KWS and KFS (L. Nakuru)	KWS (L. Naivasha)	KWS (L. Bogoria)
	Rank	Rank	Rank	Rank
Development projects	1		1	
Invasive species	1	3	5	2
Climate change	2	4	3	
Closed ecosystems	2			
Poaching	3	5	6	3
Illegal harvesting of wood	3	1		
Water pollution	4	1	2	
Fire		3		4
Hostile communities		2		6
Poisoning of wildlife			4	
Trophy hunting			7	5
Bush meat poaching				1

Source: Researcher

To reduce biodiversity threats, 90% of the respondents stated that this was possible through the formulation of better policies. Education and awareness creation was considered as the lowest option at 70% (Table 6-6).

Table 6- 6: Strategies to reduce threats towards biodiversity

Threats reduction strategies	Responses (%)
Better formulation of policies	90
Better funding	75
Involving local communities	75
More staff	75
Education and awareness creation	70

Source: Researcher

The responses were further analyzed according to the MEA institutions as shown in Figure 6-12. The findings showed that while majority of KWS respondents indicated that better formulation of policies was the best strategy of dealing with biodiversity threats, the respondents in other institutions preferred other options namely a) additional staff, b) more funding, c) involving local communities and d) education as shown in Figure 6-12.

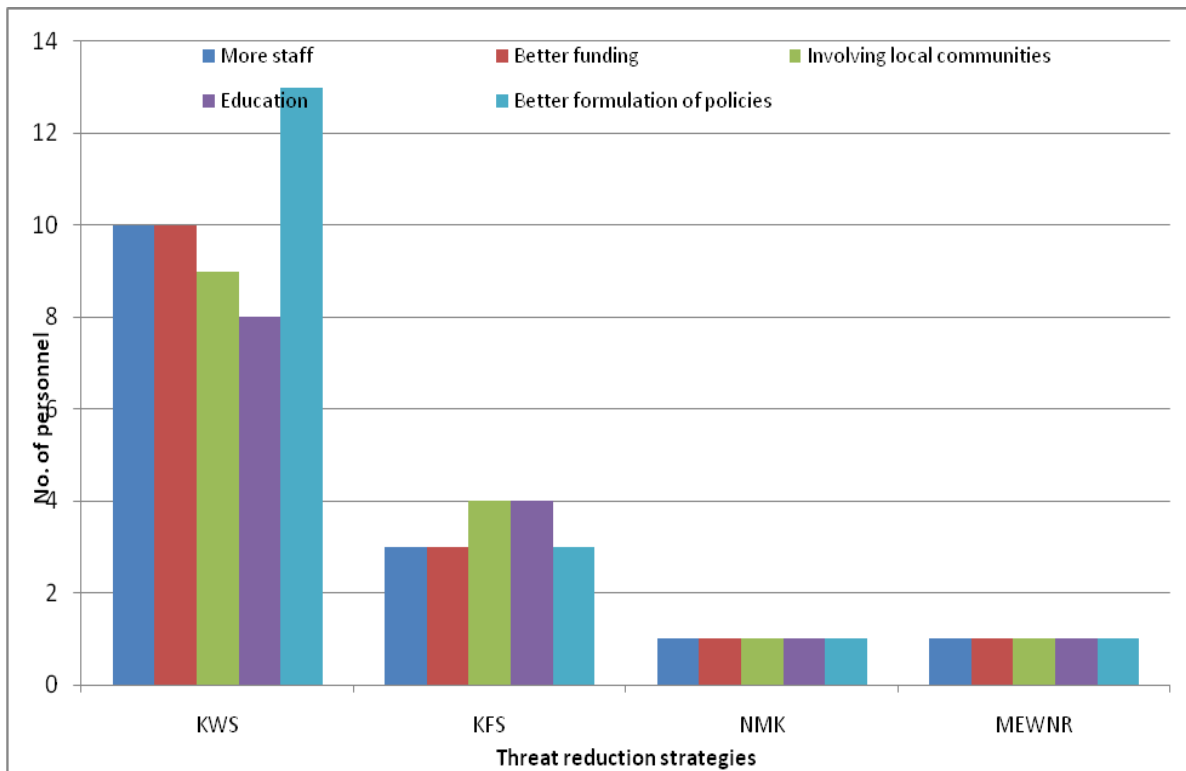


Figure 6- 12: Institutional biodiversity threat reduction strategies

Source: Researcher

6.3.6 In-situ conservation

All MEA institutional staff (100%) indicated that their MEA national institutions had the capacity to identify and recommend the gazettelement of additional areas under the MEA protection status. The KWS is already in the forefront in this area as annually it has been adding new PAs under its management.

6.4 DISCUSSION

6.4.1 Institutional capacity assessment

The findings in this study indicate an adequate institutional capacity for biodiversity MEA implementation in terms of personnel, funding and ICT. Available records show that Tanzania's PA network coverage is 36.9% (TANAPA, 2008) in comparison to Kenya's 8% (KWS, 2014b), in 2008 TANAPA had 1,650 staff (TANAPA, 2008) in comparison to Kenya's 2,500 staff (KWS, 2009).

In terms of staff duration, research done by Mboya and Ngugi (2013) at the KWS found similar results to this study (Figure 6-6). Their findings indicated that 25.6% of the staff worked for less than 5 years; 48.7% worked between 6 to 10 years and 25.7% worked for more than 10 years. However a recent study carried out by Githonga and Nyambegera (2015) at the KWS found a different trend whereby 36% of the staff had worked for less than 5 years, 34% from 6 to 10 years and 30% had worked for over 10 years. The recent trend of staff duration at the KWS can be explained by the fact that many staff had reached the retirement age and new ones were being recruited.

When funding levels of Kenya's KWS and Tanzania's TANAPA were compared, both the biodiversity institutions were found to have insufficient budgets. For example in 2011 the funding for the KWS was US\$3.5 million (KWS, 2014a) and in comparison in 2012 it was only US\$3.5 million (KWS, 2013). Similarly Tanzania's TANAPA indicated that funding had been insufficient for conservation (TANAPA, 2008). However this is not the case for all the biodiversity institutions. The NMK has been well supported in terms of funding especially from NGOs namely Birdlife International, Royal Society for the Protection of Birds, Darwin Initiative and Nature Kenya and it has been able to improve the status of many IBA sites (NMK *et. al.*, 2005).

6.4.2 Visibility of MEA obligations at institutional level

The following discussion is based on the 6 overlapping obligations in the five MEAs as identified in Section 6.3, namely a) cooperation between countries, b) research and training, c) submission of CoP and annual reports, d) biodiversity conservation, e) reducing threats to biodiversity and f) *in-situ* conservation.

6.4.2.1 Cooperation between countries

The findings showed that Kenya is doing very well in terms of collaboration with other countries in biodiversity management. Kenya is a member of regional bodies including the African Union, Economic Commission of Africa, the East African Community (EAC), the Inter-Governmental Authority on Development and the Nile Basin Initiative. These bodies help individual countries to contribute towards the implementation of regional and international environmental binding laws where CITES and the CMS are amongst the best examples requiring serious implementation to safeguard transboundary biodiversity. Continuous discussions on regional problems like prevention of trading in endangered species take place. Through the EAC, Tanzania and Kenya have been working closely to safeguard wildlife and migratory corridors such as the Mt. Kilimanjaro-Amboseli and Tsavo-Mkomazi region (UNEP, 2012). This is similar with other regions of Africa. In Southern Africa, for example, SADC member states have ratified the SADC Wildlife Sector Protocol where wildlife is protected through the Transfrontier Conservation Areas (Ibisch *et. al.*, 2010). In addition, the Lusaka Agreement Task Force (LATF) on Cooperative Enforcement Operations directed at Illegal Trade in Wild Flora and Fauna is based in Nairobi, Kenya.

Like Kenya, the Central American countries have long realized that they cannot solve the biodiversity trade problem as individual countries. They have signed the Central America-Dominican Republic and the US Free Trade Agreement whose aim is to understand the causes of illegal and unsustainable trade in wildlife and improve the capacity of the government authorities to formulate and enforce strict laws (TRAFFIC & WWF, 2008; TRAFFIC North America & WWF, 2009).

6.4.2.2 Research and training

With the help of their governments and international donors, MEA focal institutions in Kenya have been carrying out research and training on biodiversity management. A lot of joint researches and trainings are being undertaken by various institutions affiliated to the biodiversity MEA focal institutions. KWS, KFS, NMK and the MEWNR have been working very closely with the WWF on the Mara-Serengeti ecosystem. Various research projects have been conducted including the Mara River Management Initiative and the Mau Forest Restoration Programme. Vigorous training workshops for the staff from the MEA based institutions have been ongoing so as to improve TBNRM (EAC Lake Victoria Basin Commission Secretariat, 2011). Another example is in the Coastal Forests of Kenya where Nature Kenya, KFS and KWS have been working together in training personnel in the MEA sites so as to reduce threats to the forests from activities like illegal logging and waste disposal (NMK *et. al.*, 2005).

6.4.2.3 Submission of Conference of Parties and annual reports

In terms of submission of reports, this study and others established that Kenya, Tanzania and Uganda are very efficient. Through their MEA focal institutions, they have regularly submitted the required CoP reports to the CBD, CITES, CMS, Ramsar Convention and the WHC Secretariats. For example in 2014 they all submitted their fifth CoP report to the CBD Secretariat and the twelfth CoP report to the Ramsar Convention Secretariat. The KWS has been very effective in submitting its annual reports to the CITES, CMS and the Ramsar Secretariats. These annual reports are also available on the KWS website. Many countries including South Africa, Botswana, India, Malaysia and Costa Rica have been very efficient in submitting their CoP reports for all the biodiversity MEAs (www.cbd.int/convention; www.cites.org/en/reports; www.cms.org; www.ramsar.org/en/reports/; www.whc.unesco.org/en/reports accessed on 15th April 2015). However there are exceptions with countries such as the DRC and Sudan which have not done probably due to political wrangles.

6.4.2.4 Biodiversity conservation

All the five study MEAs have an obligation to conserve biodiversity with most countries trying to achieve this through both *in-situ* and *ex-situ* conservation. Although national trends indicate biodiversity loss, this is not the case for all areas. The Amboseli National Park and Arabuko

Soko Forest have, for example shown an increase in elephant population (KWS, 2012). This was found to be the case because of the successful implementation of national policies and legal frameworks at the local levels through partnership, with organisations like KWS, CBOs and NGOs. The KWS with the help of donors like GEF and the World Bank have been trying to encourage biodiversity conservation by setting up *ex-situ* conservation facilities like the Nairobi Orphanage and Safari Walk. The aim is to protect endangered, vulnerable and threatened species by educating local and other citizens (Japan International Cooperation Agency [JICA], 2005). Similarly the NMK has close links with international partners on *ex-situ* conservation projects like the Kew Gardens in London, UK, as part of Kew's Millennium Seed Bank Project which aims to collect plant species from Kenya's Arid and Semi Arid Lands (ASALs). It has also set up the Plant Conservation and Propagation Unit. The NMK in partnership with KEFRI have developed ethno-botanical gardens in the country and have been working with local communities to develop Kenya Research Network on Indigenous Knowledge, whereby the use of indigenous knowledge in biodiversity conservation is being encouraged (IEA, 2011).

Likewise, the KWS, AWF, ACC and IFAW have been working closely with local stakeholders around the Amboseli National Park and this has led to better *in-situ* conservation (Barrow *et. al.*, 1995; Muruthi, 2005). Compared to other areas of the country where there are limited efforts in partnering with communities, Kajiado County is doing well and this can be seen in terms of the stability of the wildlife population. The total wildlife count in Kajiado District in 1977 was 175,260 while in 1994 it was 148,770, indicating only a 15% decline over a period of almost seventeen years (Grunblatt *et. al.*, 1996; Rainy & Worden, 1997). This is a slow and small decline compared to other areas where large-scale wildlife population decline has been recorded. Another area where community partnering shows success is in Laikipia County where wildlife records show an increase of up to 12% from 1977 to 1994 (Grunblatt *et. al.*, 1996; Rainy & Worden, 1997). In other rangelands the loss of wildlife over the same period has been 40-80% (Ogotu *et. al.*, 2011).

6.4.2.5 Reducing threats on biodiversity

A report by NEMA (2011) has indicated that the common threats to Kenya's PAs are development projects, water pollution, invasive species; poaching and climate change. This is similar to the findings of this study which indicates development projects, water pollution, invasive species;

poaching and climate change as high ranking threats in the CBD, CMS and Ramsar sites. Furthermore studies done on the threats to PAs of Kenya by Kiringe and Okello (2007) have shown bush meat, poaching and pollutants amongst the major threats. When Kiringe and Okello's (2007) findings are compared to this study, the findings show similar threats for the CBD and the CMS sites while for the Ramsar sites, poaching and water pollution were found to be similar.

Moreover the findings of this study are also similar to studies done for individual MEA sites. A study conducted in Lake Nakuru National Park by Nelson *et. al.*, (1998) and Gichuki *et. al.* (2005) have indicated that the lake is highly affected by water pollution. This study has also shown that water pollution in Lake Nakuru is ranked as the main threat to its survival by the biodiversity MEA institutions of KWS and KFS. A similar study was carried out in the Maasai Mara by Retouch Africa International Limited in 2012 (Retouch Africa International Limited, 2013) and the findings in terms of threats for this CMS site indicated development projects, invasive species and water pollution. These threats are similar to the findings in this study as indicated by the KWS, the biodiversity institution for implementing the CBD.

6.4.2.6 *In-situ* conservation

The concept of *in-situ* conservation was born in the USA when the Yellowstone National Park was established in 1872 (Chape *et. al.*, 2005). Since then, *in-situ* conservation has been put into practice worldwide. *In-situ* conservation was enforced in 1992 when the CBD was adopted. CBD's Article 8a is centred around *in-situ* conservation. The importance of *in-situ* conservation was reinforced at the CoP 7 in 2004 where a 10% *in-situ* conservation target for contracting countries was set (Mulongoy & Chape, 2004). This target has been lifted upwards by the Aichi targets where the terrestrial and inland waters PAs must be at 17% and marine at 10% (Secretariat of the CBD, 2014).

Kenya has done remarkably well in terms of achieving *in-situ* conservation. Currently its national PA network status is 8% (KWS, 2014b). This effort dates back to the colonial times. In 1946, the Nairobi National Park became was the first national park to be gazetted in East Africa (Kristjanson *et. al.*, 2002). Since then the country has taken measures to establish more *in-situ* conservation sites. By 2013, the country had 27 national parks, 34 national reserves and 5 national sanctuaries

(KWS, 2014a). This is good in comparison to the East African neighbouring countries. Tanzania has 16 national parks (www.tanzaniaparks.com accessed on 22nd October 2015) while Uganda has 10 national parks, 12 national reserves and 13 wildlife sanctuaries (www.ugandawildlife.org/about_uganda_master/uganda_wildlife_authority accessed on 22nd October 2015). Furthermore the KWS has been taking good initiatives towards the establishment of non-state conservation areas especially around the high human-wildlife conflict zones.

6.5 SUMMARY

This study has shown that the integration of MEA obligations requires a clear adoption and reflection of such obligations in the focal institutions. The findings indicate that most of the MEA focal institutions have highly experienced staff who have been working in the conservation area for many years. Most of these professionals have adequate and relevant background training on MEA implementation. However the issue of institutional capacity in terms of budgets, transport and ICT can still be improved.

CHAPTER SEVEN

PUBLIC VIEWS ON IMPLEMENTATION OF BIODIVERSITY MEAS

7.0 INTRODUCTION

The communities living around key biodiversity conservation and MEA operational areas are very important in giving first-hand information on the level of awareness and implementation of biodiversity MEAs in Kenya from the hearts and minds of the public. This chapter highlights the public views for communities living around the MEA sites considered in this study.

7.1 THE PUBLIC RESPONDENTS

A total of 2,109 respondents were considered in the study, as explained in Chapter Four. The distribution of respondents according to the MEA study sites is shown in Figure 7-1. Lake Naivasha had the highest representation while JKIA had the lowest. The distribution of respondents per MEA site was further fragmented according to the administrative locations as shown in Table 7-1.

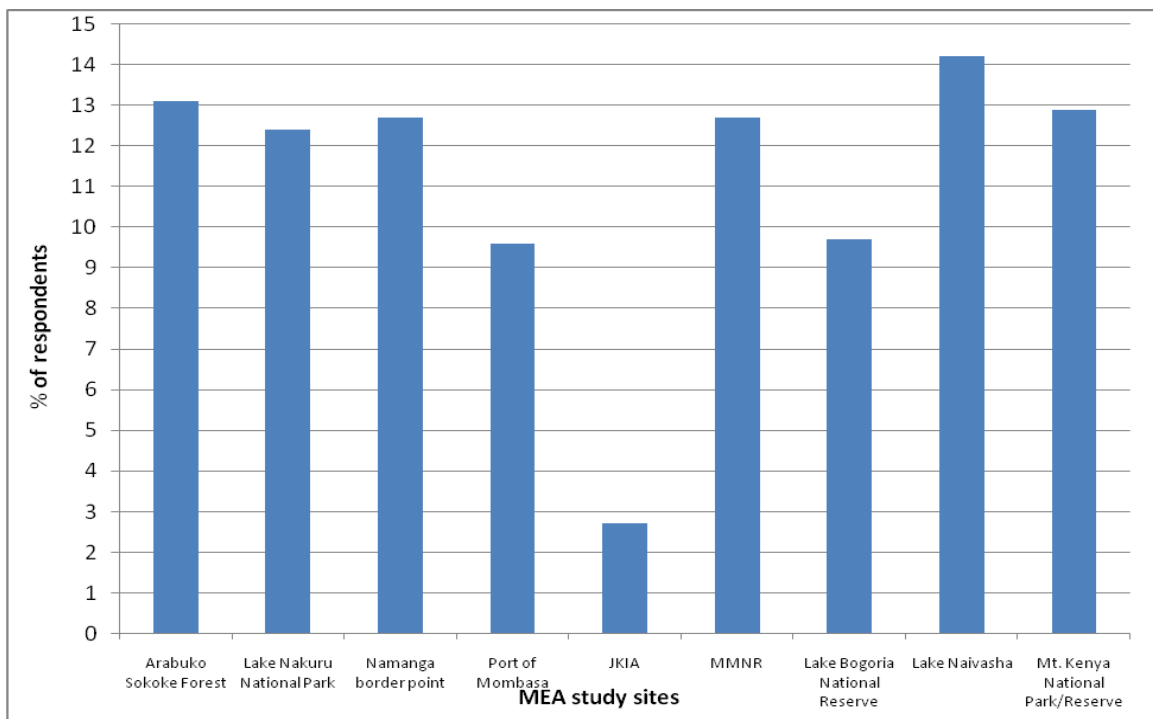


Figure 7- 1: Distribution of respondents in the MEA study sites

Source: Researcher

Table 7- 1: Distribution of respondents according to MEA study sites' administrative locations

MEA	Study site	Location	Total no. of respondents	Total population
CBD	Arabuko Sokoke Forest	Soko	30	205
		Gede	155	
		Jilore	20	
	Lake Nakuru National Park	Lanet	64	194
		Bondeni	61	
		Njoro	69	
CITES	Namanga	Namanga	198	198
	Port of Mombasa	Port of Mombasa	150	150
	JKIA	JKIA	42	42
CMS	Lake Bogoria National Reserve	Loboi (Sandai)	97	152
		Koabos (Emsos)	55	
	MMNR	Koiyaki	135	198
		Oi Kinyei	63	
Ramsar Convention	Lake Naivasha	Engineer	39	223
		Naivasha Town	59	
		Moi Ndabi (Kamere)	64	
		Hells Gate (Kwamuhia)	61	
	Lake Nakuru National Park	Lanet	64	194
		Bondeni	61	
		Njoro	69	
	Lake Bogoria National Reserve	Loboi (Sandai)	97	152
		Koabos (Emsos)	55	
WHC	MMNR	Koiyaki	135	198
		Oi Kinyei	63	
	Mt. Kenya National Park/Reserve	Ngandori East	97	203
		Nanyuki	106	

Source: Researcher

7.1.1 Respondents' characteristics

The respondents varied in terms of occupation, gender, respondents' educational levels, duration of residency near the MEA study sites and the distance of respondents' residency from MEA study sites. These characteristics were considered to be important in the analysis of community awareness of the biodiversity MEAs within their locations in accordance with objectives 2 and 3.

7.1.1.1 Gender

In terms of gender distribution, there were more males than females in all case study sites. From all the sites, Namanga had the highest number of males as shown in Figure 7-2. This was because the males were dominating all the respondents as shown in Figure 7-2.

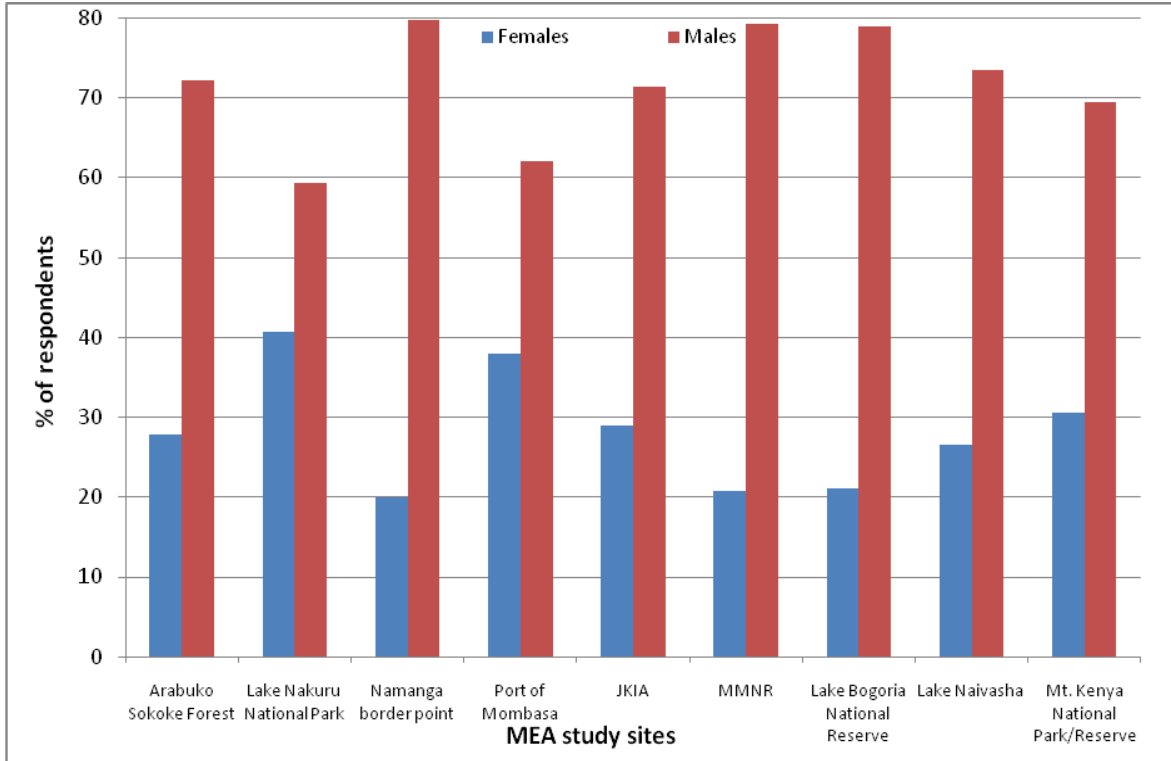


Figure 7- 2: Gender distribution in MEA study sites

Source: Researcher

Frequency scores were used to see the difference between the MEA awareness and gender as shown in Table 7-2 which shows that for all the five biodiversity MEAs namely the CBD, CITES, CMS, Ramsar Convention and WHC, the males were better aware about the conservation and operational sites being under MEAs than the females. This was not by chance but due to the distribution of the respondents whereby in each MEA there were more males than females.

Table 7- 2: MEA awareness and gender

MEAs	Awareness (%)	Gender	
		No. of males (%)	No. of females (%)
CBD	310 (77.9)	212 (68.4)	98 (31.6)
CITES	328 (84.8)	241 (73.5)	87 (26.5)
CMS	117 (33.4)	107 (91.5)	10 (8.5)
Ramsar Convention	292 (51.7)	198 (67.8)	94 (32.2)
WHC	233 (58.4)	188 (80.7)	45 (19.3)

Source: Researcher

7.1.1.2 Education

There were five categories of education levels in the sample respondents, namely, primary, secondary, university, informal and no education. Figure 7-3 illustrates the education level patterns in MEA study sites.

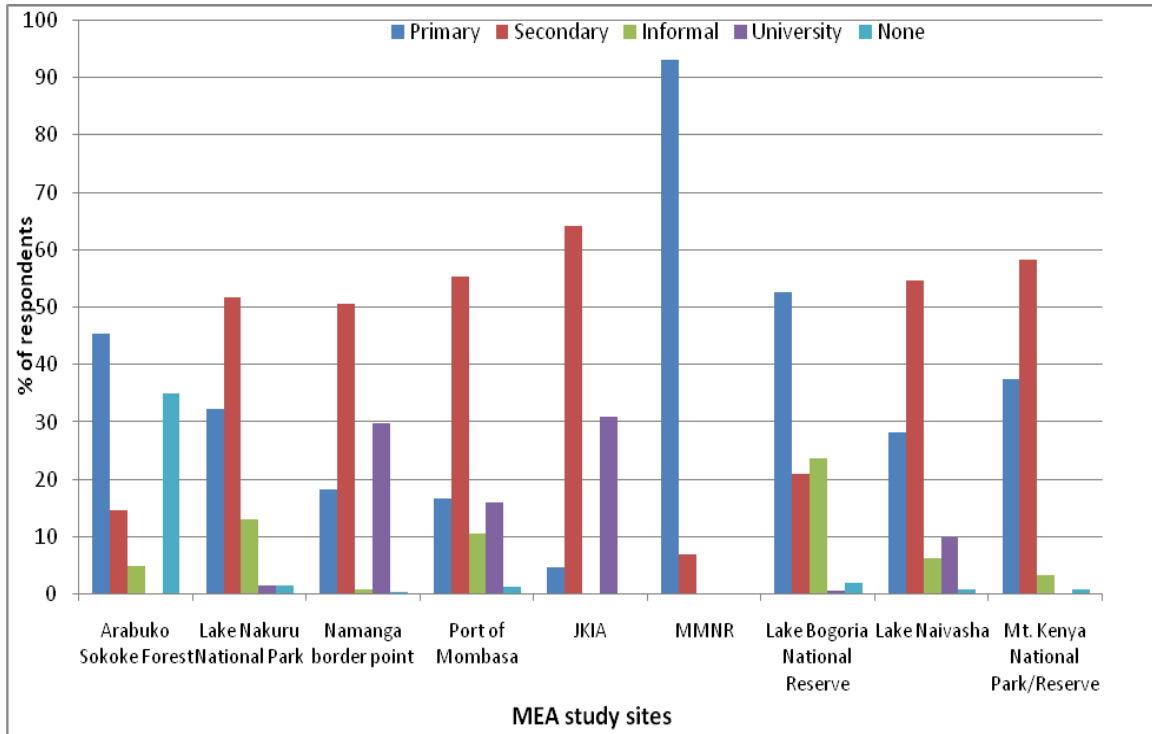


Figure 7- 3: Educational levels in MEA study sites

Source: Researcher

The JKIA was found had the most educated respondents while the MMNR had the least educated (Figure 7-3). This can be explained by the fact that the airport is in the Capital City of Nairobi where the best jobs are available based on education levels. The MMNR had the least educated respondents (Figure 7-3) because it was located in a remote rural area with poor infrastructure including schools. Similarly informal level of education was of the highest level amongst the respondents of Lake Bogoria due to the area remoteness. Finally the Arabuko Sokoke Forest had the highest number of respondents with no education at all (Figure 7-3). Although the area is less remote in comparison to some of the other MEA study sites, it is associated with high poverty levels probably also due to cultural factors.

MEA awareness and education were correlated to show the trends in awareness in relation to the education levels. For the CBD, CITES and Ramsar Convention, the patterns indicated that those with higher levels of education were better aware about the MEA sites in comparison to those with low levels of education (Table 7-3). For the CMS, the pattern indicated that MEA awareness was high even for low education level while for the WHC the level of MEA awareness was high for respondents with informal education in relation to those with formal education (Table 7-3).

The correlation analysis in Table 7-3 shows a high degree of correlation between MEA awareness and education with strong relationships recorded for the CBD (87.6%), CITES (90.6%), Ramsar Convention (97.1%) and WHC (54.2%). For the Ramsar Convention, the R^2 value in the correlation analysis indicated that 97.1% of the variation in MEA awareness (Table 7-3) was explained the level of education and this was attributed to the KWS, Wildlife Clubs of Kenya (WCK), the WWF and other institutions in creating biodiversity awareness in line with the Ramsar Convention's Obligation 6 on cooperation between stakeholders, providing education and public participation. Around Lake Nakuru National Park, the KWS in collaboration with the WCK for example, has been creating biodiversity awareness through educational programmes including field trips to the park, biodiversity documentary movies, lectures and field activities such as tree planting. Another institution creating awareness through education and activities in the area is Egerton University in Njoro which is involved in the restoration of River Njoro. For the CITES sites, the R^2 in the correlation analysis indicated that up to 90.6% of the variation in MEA awareness was explained by the level of education (Table 7-3). Like the Ramsar Convention and the CITES, the level of awareness on the CBD (87.6%) was closely correlated with the level of education (Table 7-3). In the case of WHC, the level of MEA awareness correlation analysis showed that up to 54.2% of the variation in MEA awareness was explained by the level of education (Table 7-3). This finding indicated that the WHC awareness was associated more with local indigenous knowledge and culture rather than level of formal education. However the CMS displayed the weakest correlation ($R^2=0.08$) indicating that only 0.8% of total variation in MEA awareness could be explained by the level of education (Table 7-3).

Table 7- 3: Correlation analysis for MEA awareness and level of education

% of respondents aware of MEA sites in relation to levels of education					
MEA	University	Secondary	Primary	Informal	R ²
CBD	96	79.1	71.4	69.2	y = -8.81x + 100.9 R ² = 0.876
CITES	97.9	86.5	63.5	62.7	y = -12.86x + 109.8 R ² = 0.906
CMS	0	26.1	39.8	0	y = 1.37x + 13.05 R ² = 0.008
Ramsar	95.8	68.4	29.4	15.7	y = -27.93x + 122.1 R ² = 0.971
WHC	0	62.3	55.4	85.7	y = 11.7x + 44.4 R ² = 0.542

Source: Researcher

7.1.1.3 Duration of residency around the MEA sites

The duration respondents stayed around the MEA study sites varied between less than five years to over sixteen years. The four key duration categories were, less than 5 years, 6 to 10 years, 11 to 15 years and over 16 years. Figure 7-4 shows that around Arabuko Sokoke Forest, the MMNR and Lake Bogoria National Reserve, the majority of the respondents had lived for over sixteen years. This is because most of the people around these sites are indigenous to the areas compared to the other sites where most of the respondents had stayed for less than sixteen years after migrating from other locations.

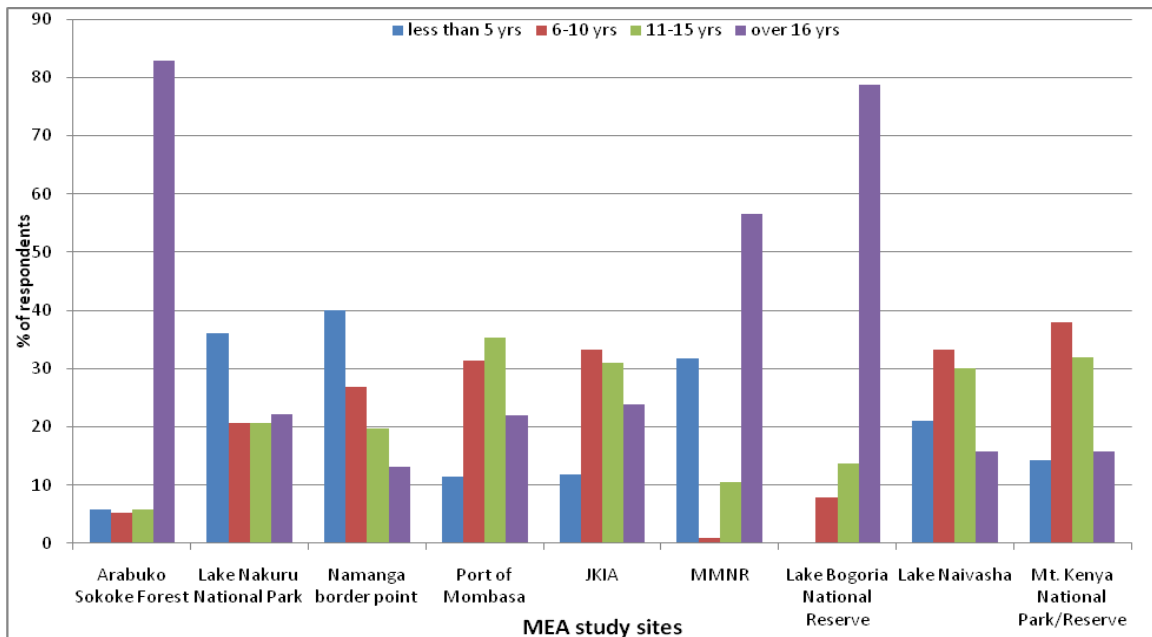


Figure 7- 4: Duration of stay for respondents around MEA study areas

Source: Researcher

The findings indicated that those who had stayed for less than five years around the MEA sites had a higher level of MEA awareness. The CBD the correlation analysis indicated that MEA awareness was high amongst those who had stayed longer in the area. For the CITES, CMS and the WHC, the patterns showed that the MEA awareness was low for people who had stayed in the area for a longer period of time. For the CBD, the results indicated increasing MEA awareness with longer residency near the MEA sites. The correlation analysis showed that up to 83.2% of the variation in MEA awareness was explained by the length of residency as shown in Figure 7-5.

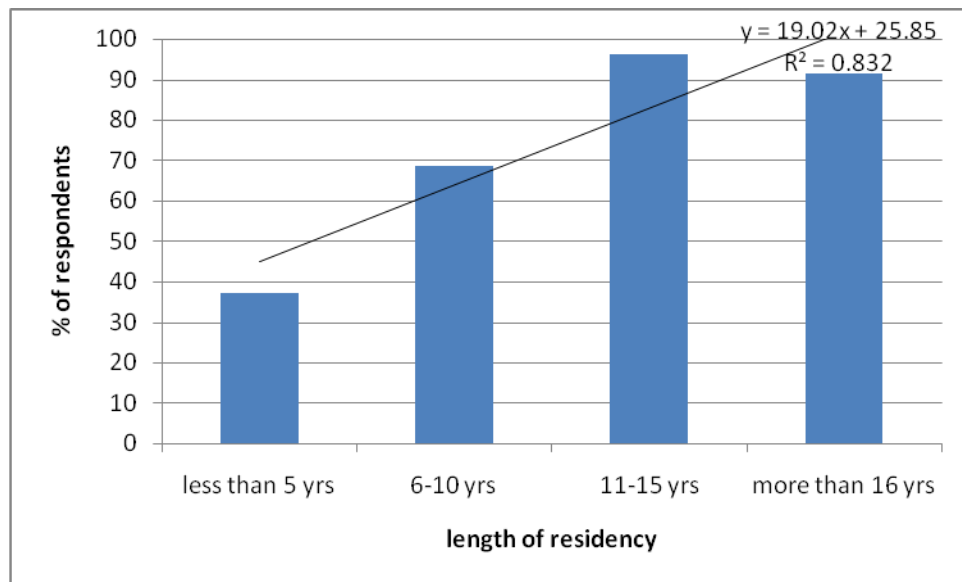


Figure 7- 5: Correlation analysis between level of CBD awareness and length of residency

Source: Researcher

For WHC the findings showed that the level of awareness was highest amongst those who had lived shorter within the sites (Figure 7-6). The R^2 for correlation analysis showed that up to 58.9% of the variation in MEA awareness was explained by the length of residency.

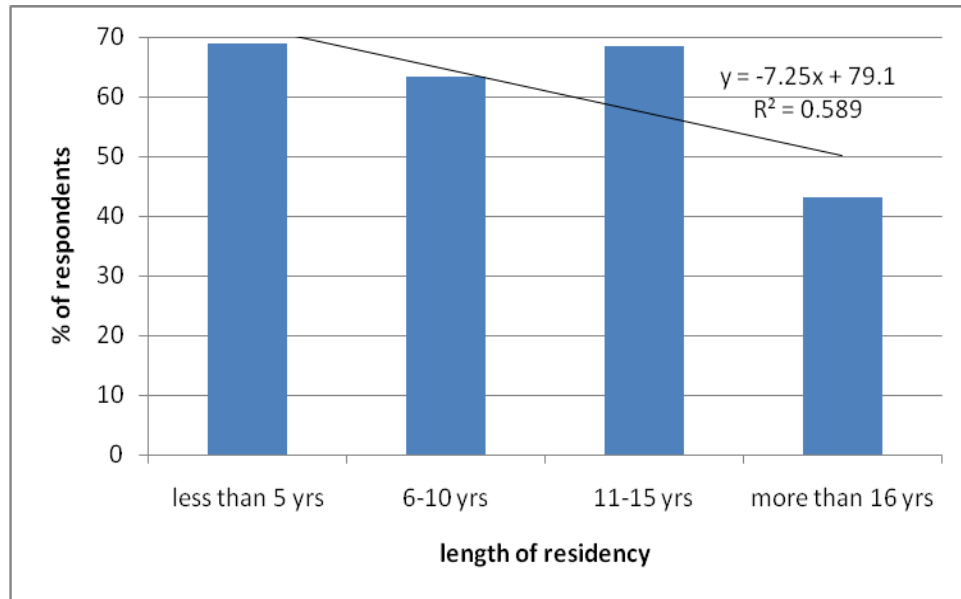


Figure 7- 6: Correlation analysis between level of WHC awareness and length of residency

Source: Researcher

In the case of the CMS, the pattern also indicated that the level of MEA awareness was higher for those who had stayed within the MEA sites for a shorter period as shown in Figure 7-7. This strange finding could be attributed to the rapid increase in the number of schools and conservancies in the recent past both in the MMNR and Mt. Kenya thereby leading to MEA awareness creation.

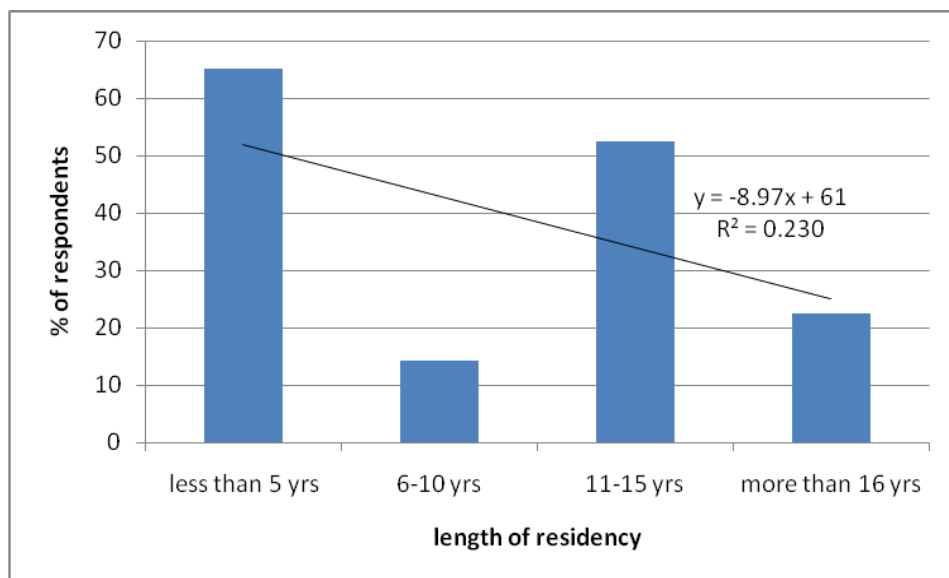


Figure 7- 7: Correlation analysis between level of CMS awareness and length of residency

Source: Researcher

The R² for correlation analysis showed that only 23% of the variation in MEA awareness was explained by the length of residency within the CMS sites.

For the CITES, the findings indicated that MEA awareness was low amongst those who had lived longest in the MEA sites as shown in Figure 7-8. The R² for the correlation analysis showed that only 20.8% of the variation in MEA awareness was explained by the length of operation period.

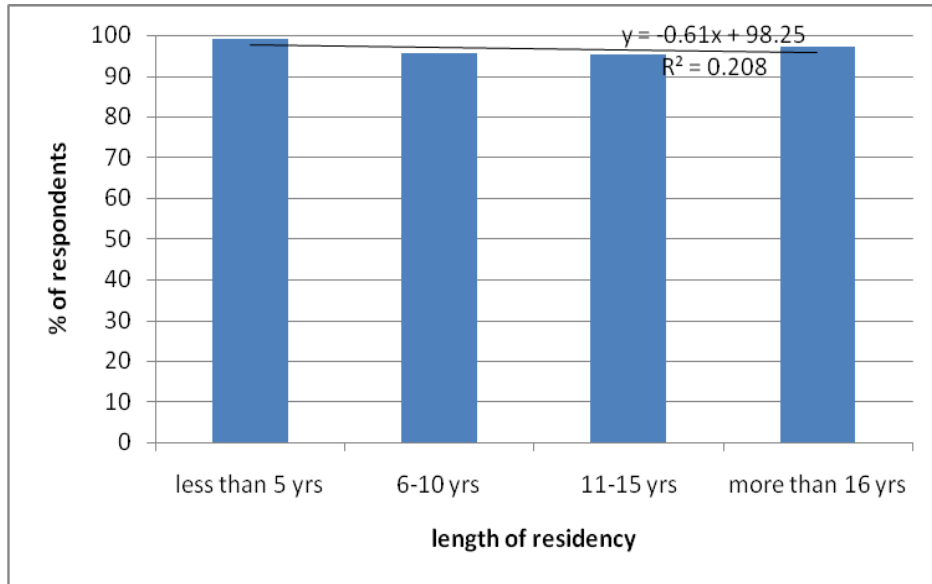


Figure 7- 8: Correlation analysis between level of CITES awareness and length of operation

Source: Researcher

For the Ramsar Convention there was no clear relationship between MEA awareness and length of residency within the Ramsar sites (Figure 7-9). There were probably other factors like education which influenced the level of MEA awareness.

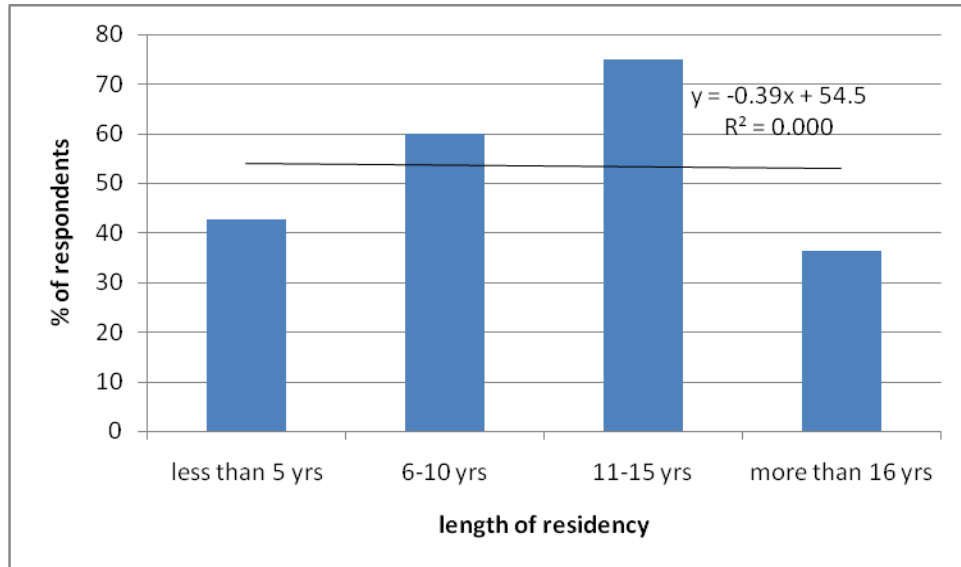


Figure 7- 9: Correlation analysis between level of Ramsar Convention awareness and length of residency
Source: Researcher

7.1.1.4 Distance from MEA sites

In terms of distance from MEA study sites, four distance categories were considered in the study, namely 0 to 1 km, 1 to 2 km, 2 to 3 km and over 3 km. Figure 7-10 shows the characterization of the respondents according to distance from the MEA site. The findings indicated that over 50% of respondents around Arabuko Sokoke Forest and Mt. Kenya National Park lived 0-1 km from the MEA sites.

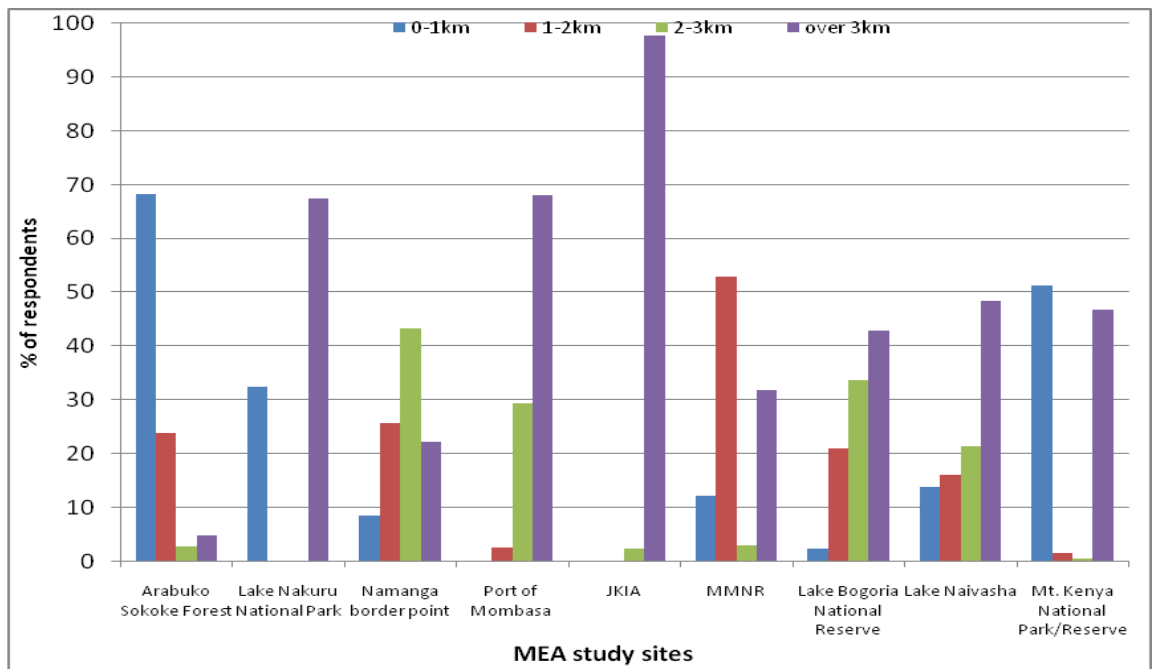


Figure 7- 10: Distance of respondents' households from MEA sites

Source: Researcher

The distance one lived from the MEA site was considered to be very important in analyzing the objective of whether biodiversity MEA awareness changes significantly with distance from the MEA conservation and operational sites. It was also important in testing the hypothesis that there is no difference between the local people's awareness with the distance from the MEA sites.

For the CBD, CMS, Ramsar Convention and the WHC, the R² for the correlation analysis indicated that 26.3%, 14.6%, 32.3% and 0.8% awareness was explained by the distance factor as shown in Table 7-4. The analysis of level of MEA awareness and distance from Ramsar sites showed that awareness was decreasing with increasing in distance from the study sites (Table 7-4). This is attributed to the intensity of education and awareness around the Ramsar sites in Lake Nakuru National Park, for example, where the KWS in collaboration with the WCK has been creating biodiversity awareness through educational programmes, including field trips to the park, biodiversity documentaries, lectures and field activities such as tree planting. Furthermore since the KWS has an education centre at the park, visitors from far come and learn about the Ramsar site. In the case of CBD sites, the findings indicated that awareness was decreasing with distance and this is similar to the Ramsar sites, with the only difference being that the distance decay relationship is weaker for the CBD. The results indicated that the distance decay model was applicable for the CBD and Ramsar sites. For the CMS, the level of MEA awareness was increasing from the sites (Table 7-4). The R² for the correlation analysis showed that 14.6% of the variation in the level of awareness was explained by distance from the MEA site. However for the WHC, there was no significant change between MEA awareness and distance (Table 7-4). The distance was not a factor to be considered for the CITES as all respondents were from the operational areas.

Table 7- 4: Correlation analysis for MEA awareness and distance from MEA sites

	% of respondents aware of MEA sites in relation to distance from MEA sites				
MEA	0-1 km	1-2 km	2 -3 km	Over 3 km	R ²
CBD	85.2	95.9	100	60	y = -7.15x + 103.1 R ² = 0.263
CMS	0	48.9	14	32.8	y = 6.35x + 8.05 R ² = 0.146
Ramsar	58	54	42	52	y = -3x + 59 R ² = 0.323
WHC	66.4	61.1	100	48.1	y = -1.6x + 72.9 R ² = 0.008

Source: Researcher

The chi square was used to test the hypothesis that there is no difference between the local people's MEA awareness with the distance from the MEA conservation areas. The degree of freedom for all the MEAs was 3. The results are shown in Table 7-5. For the CBD, CMS and WHC, the Chi-square tests led to the rejection of the null hypothesis leading to the conclusion that there was a difference between the distance one lived and awareness on the MEA designation for the area (Table 7-5).

Table 7- 5: Chi square results showing MEA awareness versus distance

MEAs	Critical Chi	Calculated Chi	Level of significance (<i>P</i> values)
CBD	7.82	43.305	0.000
CMS	7.82	38.461	0.000
Ramsar	7.82	7.810	0.005
WHC	7.82	15.533	0.000

Source: Researcher

On the other hand, Chi-square test results for Ramsar led to acceptance of the null hypothesis and led to the conclusion that there was no difference between MEA awareness and distance from MEA sites (Table 7-5).

7.2 PUBLIC VIEWS ON MEA OBLIGATIONS

The six overlapping obligations in all the five biodiversity MEAs which were considered in the study were cross-checked according to public views. From the six obligations namely a) cooperation between countries, b) research and training, c) submission of CoP and annual reports, d) biodiversity conservation, e) reducing threats on biodiversity and f) *in-situ* conservation, only obligations d, e and f were considered in the assessment because of their relevance to the local people.

7.2.1 Biodiversity conservation

Majority of the respondents in all the MEA study sites stated that biodiversity conservation was taking place (Figure 7-11). However, the people in some MEA sites, in spite of the conservation efforts, felt that biodiversity had been decreasing as indicated in Table 7-6.

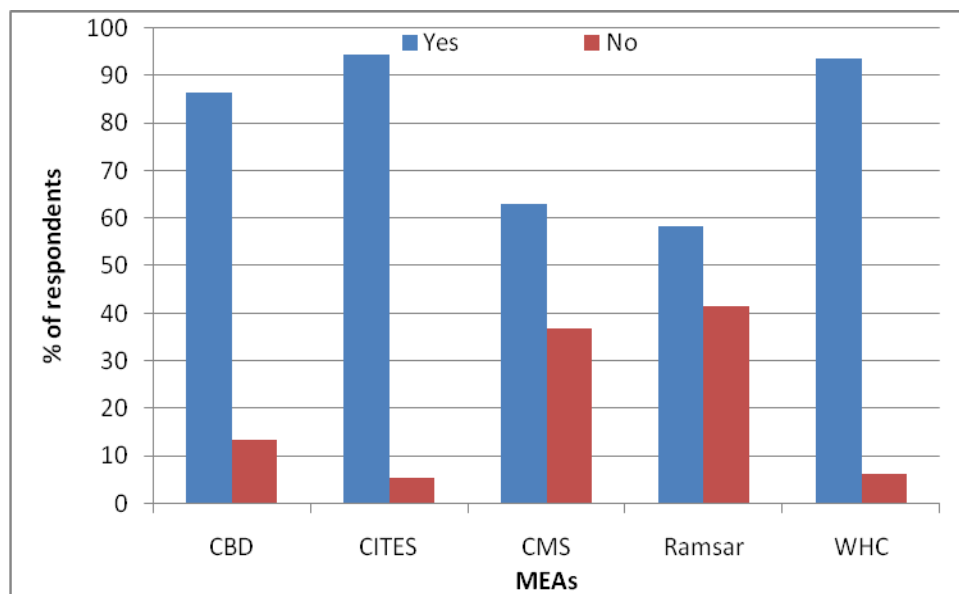


Figure 7- 11: Biodiversity conservation in MEA sites

Source: Researcher

Majority of the respondents for the CBD, Ramsar Convention and the WHC stated that biodiversity had decreased, unlike the CMS respondents who indicated that the biodiversity had increased. The latter might signify the increased interaction between people and wildlife, in the CMS sites such as the MMNR including the increasing challenges of human-wildlife conflicts.

Table 7- 6: Responses on the issue of biodiversity change

Biodiversity changes in the CBD, CMS, Ramsar Convention and the WHC sites			
MEA	No. of respondents		
	Decreased	Increased	
CBD	255	86	
CMS	-	221	
Ramsar Convention	382	152	
WHC	163	69	
Annual frequency of contrabands recovery in the CITES sites			
	1-5 times	6-10 times	Over 10 times
CITES	106	87	177

Source: Researcher

From the analysis, the findings appeared to indicate a negative public view on successful biodiversity conservation through the dimension of all MEAs except the CMS and the CITES. This was probably due to the higher funding for the two MEAs compared to the other MEAs. The success of the CBD domestication was not visible in the eyes of the respondents although this is the umbrella MEA. Most of the respondents around the Ramsar Convention sites indicated that the size of the wetlands was decreasing thereby threatening waterfowl biodiversity. From the public

view it appeared that the domestication and implementation on the ground was poor in spite of its good integration in the policy. The majority of the respondents for the WHC, like the CBD and the Ramsar Convention also indicated a serious challenge of biodiversity loss in spite the good national integration of MEA obligations in the policies.

7.2.2 Identification of biodiversity threats

Table 7-7 shows the public opinion on the key biodiversity threats within the respective MEA sites. From the findings, the Ramsar Convention had the highest number of threats (16), followed by the CBD and the WHC which had eleven threats each, while the CITES and CMS had four each. On the overall, population increase, deforestation, human-wildlife conflicts and decreasing wildlife populations were considered to be the most serious threats in the eyes of the public. For the CMS and Ramsar sites, human-wildlife conflict was regarded as the biggest threat in the minds of the public. This can be explained by the reality on ground whereby terrestrial migratory corridors and wetland ecosystems are also considered as suitable areas for agriculture and livestock husbandry and the latter, also for fishing. In the WHC, deforestation was recorded as a major threat due to the high demand for forest products. Climate change, according to the public opinion was the least of the threats in the CBD and Ramsar sites. This was probably because most people are yet to understand the problem.

Table 7- 7: Public perceptions on the national biodiversity threats

Threats	CBD	CITES	CMS	Ramsar Convention	WHC	Total
1. Land shortage	123			16	35	174
2. Population increase	41		8	37	23	109
3. Deforestation	79		39	34	114	266
4. Lack of education and awareness	8			4		12
5. Poaching	16				33	49
6. Water pollution	6			20		26
7. Climate change	2			4	82	88
8. Improper waste disposal	37			39		76
9. Human-wildlife conflicts	18		149	160	52	379
10. Drying up of the water bodies	36			36		72
11. Decreasing wildlife population	11		104	11	104	230
12. Invasive species				18		18
13. Unemployment				10		10
14. Decreasing fish stocks				53		53
15. Over abstraction of water from rivers and lakes				137		137
16. Poverty		199		28	7	234
17. Food shortage				5	6	11
18. Bush meat poaching					10	10
19. Charcoal production					16	16
20. Insecurity		50				50
21. Lack of screening equipment		269				269
22. Corruption		69				69

Note: Blank spaces indicate that there were no responses

Source: Researcher

The biodiversity threats according to the public were cross-checked against the views of the institutional respondents. The findings are shown in Table 7-8. The results showed that there were only three common threats in the case of the CBD, namely water pollution, climate change and poaching. There was no similarity in the biodiversity threats for the CITES and CMS. In the case of the Ramsar Convention, there were three similar threats, namely water pollution, climate change and invasive species. For the WHC, there were three common threats, namely poaching, bush meat and climate change. This findings indicated a disconnect between the biodiversity managers in the government and local people on the ground.

Table 7- 8: Institutional and community identified biodiversity threats

Threats	MEAS									
	CBD (Ranks)		CITES (Ranks)		CMS (Ranks)		Ramsar Convention (Ranks)		WHC (Ranks)	
	institutional	community	institutional	community	institutional	community	institutional	community	institutional	community
1. Climate change	3	11			2		7	16	6	3
2. Invasive species	4				4		2	10	3	
3. Development projects	5		8		1		1		1	
4. Hostile communities	7		9		10		9		10	
5. Poaching	8	7	1		3		8		7	6
6. Illegal wood harvesting	2		2						5	
7. Bush meat poaching	9		3		6		4		8	9
8. Trophy hunting	10		5		9		10		11	
9. Poisoning of wildlife	11		4		8				9	
10. Fire	6		6		7		5		2	
11. Land shortage		1						11		5
12. Population increase		3				4		5		7
13. Deforestation		2				3		7		1
14. Lack of education and awareness		9						15		
15. Improper waste disposal		4						4		
16. Human-wildlife conflicts		6				1		1		4
17. Drying up of the water bodies		5						6		
18. Decreasing wildlife population		8				2		12		2
19. Water pollution	1	10	7		5		3	9	4	
20. Poverty				2				8		10
21. Lack of checking equipment				1						
22. Corruption				3						
23. Insecurity				4						
24. Closed ecosystems							6			
25. Unemployment								13		
26. Decreasing in fish stocks								3		
27. Over abstraction of water from rivers and lakes								2		
28. Food shortage								14		11
29. Charcoal production										8

Note: Blank spaces indicate that there were no responses

Source: Researcher

The top 10 public threats were aligned with their relevant MEA obligations, policy integration and institutional capacity. The findings are shown Table 7-9.

Table 7- 9: Top ten public threats in relation to MEA obligations, policy integration and institutional weaknesses

Public threats	Related MEA obligations	Level of policy integration (%)	Institutional capacity weaknesses
1. Human-wildlife conflicts	CBD - Obligation 2	25.4	Personnel, funding
	CMS - Obligation 9	21.0	Personnel, vehicles, ICT
	Ramsar - Obligation 8	4.7	Personnel
	WHC - No obligation	No obligation	Personnel, vehicles, funding
2. Lack of screening equipment	CITES - Obligation 2	68.4	Personnel, vehicles, ICT
3. Deforestation	CBD - Obligation 2	25.4	Personnel, funding
	CMS - Obligation 9	21.0	Personnel, vehicles, ICT
	Ramsar - Obligation 8	4.7	Personnel
	WHC - No obligation	No obligation	Personnel, vehicles, funding
4. Poverty	CITES - No obligation	No obligation	Personnel, vehicles, ICT
	Ramsar - No obligation	No obligation	Personnel
	WHC - No obligation	No obligation	Personnel, vehicles, funding
5. Decreasing wildlife	CBD - Obligation 2	25.4	Personnel, funding
	CMS - Obligation 9	21.0	Personnel, vehicles, ICT
	Ramsar - Obligation 8	4.7	Personnel
	WHC - No obligation	No obligation	Personnel, vehicles, funding
6. Land shortage	CBD - Obligation 2	25.4	Personnel, funding
	Ramsar - Obligation 8	4.7	Personnel
	WHC - No obligation	No obligation	Personnel, vehicles, funding
7. Overabstraction of water from rivers and lakes	Ramsar - Obligation 8	4.7	Personnel
8. Population increase	CBD - Obligation 2	25.4	Funding, personnel
	CMS - Obligation 9	21.0	Personnel, vehicles, ICT
	Ramsar - No obligation	No obligation	Personnel
	WHC - No obligation	No obligation	Personnel, vehicles, funding
9. Climate change	CBD - Obligation 2	25.4	Funding, personnel
	Ramsar - Obligation 8	4.7	Personnel
	WHC - No obligation	No obligation	Personnel, vehicles, funding
10. Improper waste disposal	CBD - Obligation 2	25.4	Funding, personnel
	Ramsar - Obligation 8	4.7	Personnel

Source: Researcher

The CBD is covered by Obligation 2 which states identifying threats and monitoring status of biodiversity and habitats. Besides the obligation featuring poorly in the policy prescriptions, the institutional capacity of this MEA in terms of funding and personnel is poor. For example at the MEA site institutions, there were no staff from the MEWNR and the management was mainly done by the KWS for the PAs of national parks and national reserves and the KFS for forest reserves.

Under the CITES, the public identified lack of endangered species screening equipment as a major threat. This obligation is covered under Obligation 2 on regulating trade in endangered species.

Although the policy integration is above average at 68.4%, this MEA has poor ICT capacity under which the screening equipment falls, thus indicating the failure of eliminating this threat. While poverty was also seen as a threat under this MEA, there is no obligation under which this public threat is accommodated indicating a loophole in reducing this threat.

The identification of biodiversity threats for the CMS was associated with Obligation 9 on removing threats to migratory corridors and migratory species. This obligation obtained a very low policy integration level at 21% and it also has poor institutional capacity in terms of personnel, vehicles and ICT. For the Ramsar Convention the identification of biodiversity threats was associated with Obligation 8 on parties to inform IUCN of every change in ecological character of wetlands which caters for public threats. This obligation achieved a very poor policy integration of 4.7% indicating that the policies have not taken this obligation seriously. Regarding the WHC, unfortunately there are no obligations which take the public view on threats to the natural heritage seriously. Thus it becomes difficult for the MEA focal institution to implement it. In the management plans for the PAs under the WHC, threats are mentioned based on the institutional view and mitigation measures are poorly prescribed. The MMNR management plan of 2009-2019 is an example of this.

The institutional and the community rated threats were further subjected to a paired t-test so as to test the hypothesis that there is no difference in the typology of threats affecting the domestication and application of biodiversity MEAs in Kenya. The findings are shown in Table 7-10.

Table 7- 10: Paired t-test results for institutional and community based threats

MEA	t value	Level of significance (P values)	Accept/reject null hypothesis
CBD	2.62	0.02	Reject
CITES	2.30	0.18	Reject
CMS	1.86	0.11	Reject
Ramsar Convention	3.16	0.005	Reject
WHC	3.34	0.005	Reject

Source: Researcher

The results of the paired t-test whereby indicated that the null hypothesis that there is no difference in the typology of threats affecting the domestication and application of biodiversity MEAs in Kenya was rejected for all the five biodiversity MEAs.

7.2.3 In-situ conservation

Most respondents indicated that they were contented with the efforts towards the establishment of a reliable network of PAs in the country as well as dealing with illegal operations in such areas. The highest level of satisfaction was recorded in the CITES sites and the lowest in the Ramsar sites.

The findings showed that the public viewed the Ramsar Convention as the best implemented especially in terms of the institutional efforts towards *in-situ* conservation while the CITES the weakest. This is closely related with the policy integration and institutional capacity as shown in Table 7-11.

Table 7- 11: MEA obligations, policy integration and institutional capacity towards in-situ conservation

MEA	Related MEA obligations	Level of policy integration (%)	Institutional capacity strengths
CBD	1	100	Highly educated and trained staff with experience, ICT, vehicles
	4	39.4	
	5	15.9	
	6	17.5	
CITES	2	68.4	Highly educated and trained staff with experience, funding
	3	17.9	
CMS	1	34.7	Highly educated and trained staff with experience, funding
	6	30.1	
	8	8	
Ramsar	2	100	Highly educated and trained staff with experience, funding, ICT, vehicles
	3	42.8	
	5	3.7	
WHC	1	96.8	Highly educated and trained staff with experience, ICT
	2	35.4	

Source: Researcher

An assessment of the most successful institutions in terms of *in-situ* conservation indicated that the KWS and KFS were rated the best as shown in Table 7-12.

Table 7- 12: Institutional efforts towards in-situ conservation

MEA	No. of respondents							Total
	KWS	KFS	BCC	KCC	Nature Kenya	NCC	KMFRI	
CBD	141	226	-	-	-	-	-	367
CITES	155	54	-	-	-	-	-	209
CMS	127	-	97	55	-	71	-	350
Ramsar Convention	178	35	97	55	13	-	102	480
WHC	206	21	-	-	-	71	-	298
Total	807	336	194	110	13	142	102	

Source: Researcher

7.2.4 Involvement of communities in biodiversity management

Majority of the respondents from the CBD, CMS, Ramsar Convention and WHC sites indicated that they were not involved in the management of biodiversity within their local areas. The findings were contrary to the CITES where 54% of the respondents indicated that they were given an opportunity to make decisions (Figure 7-12).

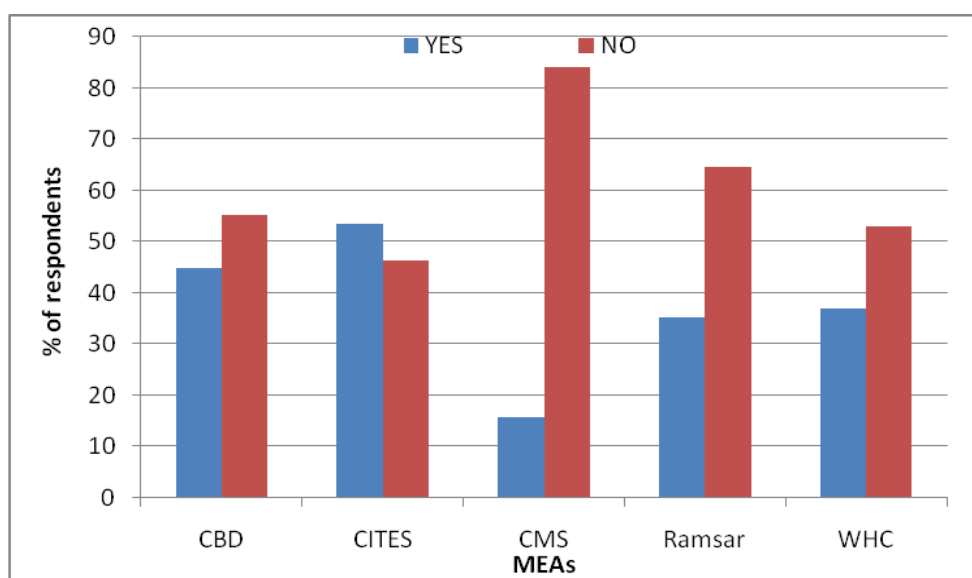


Figure 7- 12: Community involvement in decision making

Source: Researcher

The respondents further indicated the biodiversity projects they had participated in. The Ramsar Convention had the highest number with 573 participants and three activities, followed closely by the CBD with 568 participants but with more activities. The CITES had only one activity and the lowest number of participants as shown in Table 7-13. For the CBD, CMS, Ramsar Convention and WHC, most respondents had participated in more than one biodiversity management project (Table 7-13).

Table 7- 13: Community involvement in biodiversity management projects

Projects	No. of respondents				
	CBD	CITES	CMS	Ramsar Convention	WHC
Kipepeo butterfly farming project	52	-	-	-	-
Tree planting	212	-	-	227	127
Tree nurseries	21	-	-	-	-
Education and awareness creation	216	242	270	323	199
Mushroom farming	22	-	-	-	-
Ecotourism	22	-	86	-	86
Cleaning River Njoro	23	-	-	23	-
Total	568	242	356	573	412

Source: Researcher

Source: Researcher

The findings on the ground were found to be very closely related with the policy status and institutional capacity for the various MEAs as shown in Table 7-14.

Table 7- 14: MEA obligations, policy integration and institutional capacity towards community involvement

MEA	Related MEA obligations	Level of policy integration (%)	Institutional capacity strengths
CBD	5	15.9	Highly educated and trained staff with experience, ICT, vehicles
	6	17.5	
	8	32.7	
	13	21.8	
CITES	No obligation	No obligation	Highly educated and trained staff with experience, funding
CMS	6	30.1	Highly educated and trained staff with experience, funding
	10	39.1	
Ramsar	3	42.8	Highly educated and trained staff with experience, funding, ICT, vehicles
	6	8.7	
WHC	2	35.4	Highly educated and trained staff with experience, ICT
	7	16.8	
	9	3.7	

Source: Researcher

7.2.5 Minimizing threats on biodiversity

The respondents of the CBD, CMS and the WHC indicated that biodiversity threats had reduced in the sites unlike in the CITES and the Ramsar sites where they indicated that the situation had not changed. This is shown in Figure 7-13.

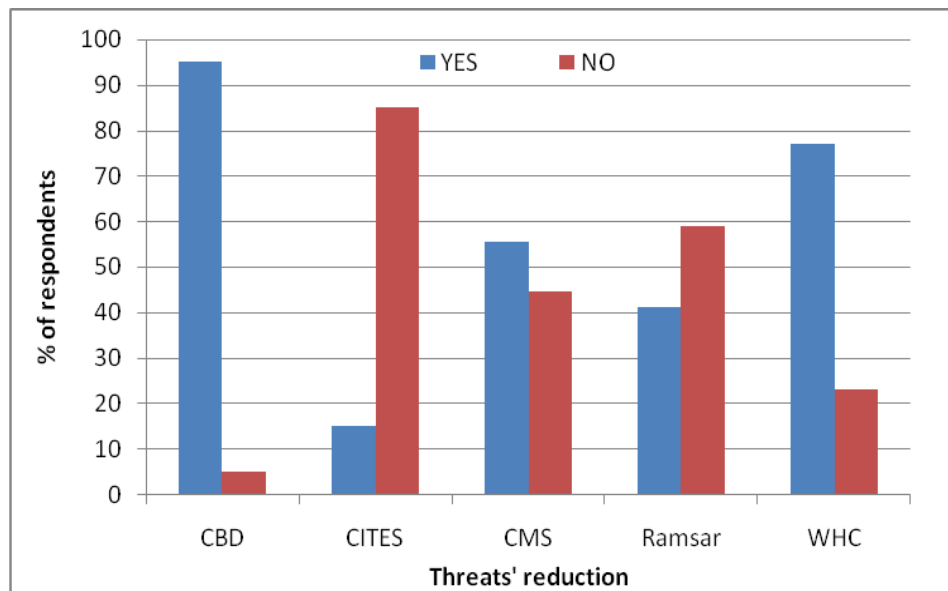


Figure 7- 13: Minimization of threats on biodiversity

Source: Researcher

With respect to the MEA obligations, all the five MEAs recorded significant policy failure and related institutional weaknesses. Table 7-15 shows this scenario.

Table 7- 15: MEA obligations, policy integration and institutional weaknesses in relation to minimization of threats

MEA	Related MEA obligations	Level of policy integration (%)	Institutional capacity weaknesses
CBD	7	7.6	Personnel, funding
	11	20.4	
	13	21.8	
	14	8.9	
	16	19.2	
CITES	2	68.4	Personnel, vehicles, ICT
	3	17.9	
	4	48.0	
	10	57.4	
CMS	2	30.7	Personnel, vehicles, ICT
	4	9.2	
	7	10.4	
	9	21.0	
	10	39.1	
Ramsar Convention	1	0.8	Personnel
	3	42.8	
	4	9.3	
	6	8.7	
WHC	2	35.4	Personnel, vehicles, funding
	7	16.8	
	9	3.7	

Source: Researcher

The public viewed the CBD as the best biodiversity MEA in terms of minimization of biodiversity threats. The CMS respondents had a view that the threats had been reduced in MEA sites. In the WHC the people indicated that biodiversity had reduced. This indicated that the policies were being implemented. This can be explained in terms of one of the sites, namely Mt. Kenya National Park, where efforts by the KWS and KFS in educating the communities living around the park on the importance of biodiversity conservation have been ongoing to reduce biodiversity-related threats. In the CITES sites, the public views were very negative, probably because of the widespread cases of illegal poaching in the country especially in 2012.

The overall analysis of public views on all five biodiversity MEAs indicated the CITES and the CMS were better domesticated and implemented followed by the CBD and the WHC while the Ramsar Convention was rated as the weakest MEA in terms of its implementation (Table 7-16).

Table 7- 16: Effective implementation of MEAs at community level

MEAs obligations	Effective implementation of biodiversity MEAs									
	CBD		CITES		CMS		Ramsar Convention		WHC	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Q1. Biodiversity conservation		√	√		√			√		√
Q2. Public identification of biodiversity threats	√		√		√		√		√	
Q3. <i>In-situ</i> conservation	√		√		√		√		√	
Q4. Involvement of communities in biodiversity management		√	√			√		√		√
Q5. Minimizing threats on biodiversity	√			√	√			√	√	
Total	3	2	4	1	4	1	2	3	3	2
% score	60	40	80	20	80	20	40	60	60	40

Source: Researcher

The CITES was rated highly probably due to the efforts of KWS in terms of providing education and creating awareness on poaching and illegal trade in biological products. The CMS was also highly rated probably because the KWS had increased its partnership with neighbouring countries like Tanzania, private land owners and NGOs to set up conservancies and establish community game scouts to support the State in biodiversity conservation. The CBD and the WHC were also well rated by the public in terms of MEA implementation. The CBD also has good institutional capacity in terms of qualified, trained and experienced staff, vehicles and ICT. The Ramsar Convention was viewed as the weakest in terms of involving the public. When comparing the facts on the ground, this was because the MEA site of Lake Naivasha had the most stakeholders and many felt that their interests were not considered. For example the lakeshore pastoralists felt that the priority was given to the farmers who messed the lake and increased threats to biodiversity. Another example is of Lake Bogoria where the community felt that they had never been involved in any decision making nor have their interests as stakeholders ever been considered. They expressed that their rights to the reserve in terms of grazing had also been revoked.

7.3 DISCUSSION

7.3.1 MEA public awareness

7.3.1.1 Gender and MEA awareness

The overall study findings indicated that the male respondents had better awareness of biodiversity MEAs than their female counterparts. Literature review from the tropical countries has shown similar finding which has been explained in relation to cultural practices. Studies carried out by Merchant (1980) and Shiva (1989) have shown that women in Nepal and India do not have equal

chances of being educated in comparison to men because cultural practices. The culture requires that knowledge on natural resources and the environment should be reserved for men because women are meant to concentrate on household chores. The same is the case in Cameroon where gender disparities on MEA awareness are very high because of cultural practices where males as the dominant gender are believed to have the sole rights over biodiversity and natural resource knowledge and ownership (RoC, 2012).

Amongst the Maasai in Kenya, cultural practices encourage early marriages of girls where they are expected to concentrate more on housework. They have restricted access to education (Talle, 1988; 1999) which reduces MEA awareness. This scenario has been captured in the MMNR, where a community member stated as follows:

“We (the Maasai) do not believe that women should know more about wildlife and the MMNR. This is because they have nothing to do with that. It is us, the men and our morans who should know more about the wildlife and issues to do with the MMNR. The place for women is in the kitchen. They cannot do hunting so why bother them with issues on conservation when they have no idea about them!” (**Ole Indieri [Maasai Elder], personal communication**)

Besides culture, another factor found to be contributing towards low levels of MEA awareness by women is the lack of gender mainstreaming in most national policies. For example the WHC is mainly implemented through the National Policy on Culture and Heritage (GoK, 2009c) which lacks a policy statement on gender, especially women. Other examples are the Draft Natural Resources Development and Management Policy (GoK, 2012c) and the Draft ICZM Policy (GoK, 2007a), which have also not taken gender issues into consideration. Ghana’s situation is similar to Kenya as very few biodiversity policies have integrated gender issues (Tufuor, 2005). However, Rwanda’s situation is different from both Kenya and Ghana as all the biodiversity policies set up since 2004 have integrated gender (USAID, 2008).

7.3.1.2 Education and MEA awareness

The overall findings indicated that the relationship between MEA awareness and education was positive. Those who had education were found to be more aware of the MEA status of the areas they lived in. The relationship for the Ramsar Convention was seen to be stronger than the others as 97.1% of the level of MEA awareness was accounted for by education. This was the case because of the Communication, Education and Public Awareness (CEPA) programme on wetlands conservation and wise use which is continuous around all Ramsar sites in the country. Around Lake Naivasha, MEA awareness was found to be high because of the presence of two education centres namely Elsamere which provides very valuable conservation education for schools and the Kenya Wildlife Service Training Institute (KWSTI) which offers specialised training programmes on wetlands including an international Ramsar accredited wetlands training course annually. Similarly Lake Nakuru's education centre also provides education about the MEA site to the visiting schools (GoK, 2005c).

This finding was similar to the WHC and CBD sites of Bwindi Impenetrable National Park in Uganda, Pendjari National Park in Benin and Masoala National Park in Madagascar. With the help of UNESCO, the Ugandan government has set up schools around the Bwindi Impenetrable National Park so as to encourage the communities, especially the youth, to get educated. This education highlights the importance of the park as an international site of significant importance. The government has also set up the Bwindi-based Institute of Tropical Forest Conservation near the park, which offers training related to forest and wildlife conservation, importance of management in MEA sites and PAs and the implications of policies and legal frameworks on biodiversity among others (Dudley *et al.*, 2003; UNESCO, 2005). Research carried out around the Pendjari National Park in Benin by Vodouhê *et al.* (2010) found out that the awareness of the WHC site was very high among the local communities as most of the people were educated. This was because of the government's efforts to cater for schools around the park. According to Ormsby and Kaplin's study (2005) around the Masoala National Park in Madagascar, 93% of the residents were aware that the park was an important CBD site. This awareness was brought by the education and awareness programs introduced by the park's authorities.

In the CBD site of Arabuko Sokoke Forest, MEA awareness levels were high because of the efforts of both the government institutions such as KFS, KWS and NMK and the NGOs. The presence of

an NGO, A Rocha Kenya provided bursaries to children and their parents to go to school. The NGO's effort was further supplemented by the KFS education program and the KWS information offices. The two have worked together in the area to cater for environmental education in schools and amongst adults who had no or informal education. Similarly in the CBD site of Lake Nakuru, there are many schools in the vicinity of the park and the KWS has set up the largest education centre in the country. The WCK has joined the efforts of the KWS and set up the country's largest educational centre inside the Lake Nakuru National Park, which is visited by over 100,000 children annually. Through the efforts of the KWS and WCK, many schools have been encouraged to take children to the national park, educational talks on the importance of the MEA site are given, movies are shown and school children are encouraged to participate in various environmental activities through the Wildlife Clubs in their respective schools (<https://www.kws.org/parks/education/> accessed on 14th March 2015).

For the WHC, the relationship between MEA awareness and education was clearly visible around the Mt. Kenya National Park which is also designated as a Biosphere Reserve under the UNESCO MAB programme and has very good educational initiatives including training of CBOs on the importance of the MEA site and field activities like tree planting and tree nurseries which have trickled to the national level through the institutions of MEWNR, Ministry of Education and biodiversity institutions such as KWS and KFS. Through the National Education and Awareness Initiative Programme the MEWNR, Ministry of Education, KWS and KFS have created very good awareness on the importance of Mt. Kenya National Park as a MEA site (www.environment.go.ke accessed on 14th March 2015). This is in line with Obligation 7 (Article 27) of the WHC on education and awareness creation.

For the CITES, the relationship between MEA awareness and education was positive because two of the MEA sites, namely Nairobi and Mombasa, are key towns in the country and have among the best educational facilities. At the same time the KWS works very well with the WCK to encourage school students to participate in campaigns against poaching and the right use of border points. The city also has two educational centres in Nairobi, which are the Nairobi Orphanage and the Nairobi Safari Walk, which also strengthen the MEA awareness in the city.

The results of this study indicated a significant contrast between the Ramsar, CITES, CBD and the WHC sites with the CMS sites of Kenya. This was found to be the case because around the MMNR, a CMS site the people are pastoralists and keep on moving from one place to the other. This is similar to the case of the Fulani people who live and move with their cattle to the Pendjari National Park in Benin from neighbouring Nigeria during dry spells, and like the Maasai, do not value education (Vodouhê *et. al.*, 2010). For the CMS site of Lake Bogoria, the area is very remote thus hindering the development of infrastructure like schools, indicating low or no MEA awareness in relation to education.

7.3.1.3 Duration of site residency and MEA awareness

According to this research the overall relationship between the duration of residency around the study sites and the level of MEA awareness indicated that those who had resided for shorter duration near the MEA sites were better aware of the MEA sites than those who stayed for a longer period. This was contrary to the standard explanation. Research carried out by Silori (2007) in the Nanda Devi Biosphere Reserve in India, which is a UNESCO MAB site and a CBD site, also indicated similar findings for the CITES, CMS and the WHC where people who had stayed for less than five years were found to be better aware of the site's MEA status. This was explained by the fact that things had begun to change for the communities in the last five years as they were considered to be important stakeholders in the decision making on any matter involving the reserve.

At the same time, studies carried out in Kaziranga National Park in Assam, India, Machalila National Park in Ecuador as well as Masoala National Park in Madagascar have shown that irrespective of the number of years one has stayed around a MEA site, there are other critical factors determining the level of MEA awareness, especially the level of education and direct community involvement in MEA decision making (Fiallo & Jacobson, 1995; Ormsby & Kaplin, 2005; Heinen & Shivastava, 2009).

The strong link between residency duration and level of MEA awareness for the CBD can be associated with the continuous campaigns on biodiversity conservation by A Rocha Kenya, KWS and KFS around the Arabuko Sokoke Forest. They have also encouraged local communities to

form biodiversity conservation CBOs which have increased awareness amongst the local communities. Around Lake Nakuru National Park, the KWS has been working in full force with the WCK and WWF to create awareness amongst all the people in the catchment and further away.

7.3.1.4 Distance and MEA awareness

The overall findings indicated that MEA awareness decreased with increasing distance away from the MEA sites. This was found to be the case for the CBD, CITES and Ramsar Convention. The people living immediately around the MEA sites were close to focal institutions which had set up educational and information centres. At the same time as one moved away from the MEA sites, the influence of both the national focal institutions and the conservation NGOs declined. However for the CMS, MEA awareness was found to be increasing with distance while for the WHC there was no significant pattern.

In the case of the CBD, the MEA awareness was also decreasing with increasing distance from the site. This trend was clearly visible around the Arabuko Sokoke Forest. The NGOs and CBOs in the area have increased the level of awareness amongst the communities living in the immediate buffer zone of the forest. The forest is also the site for the world famous Kipepeo (Kiswahili for butterfly) Project, which is a community-based enterprise that supports the livelihoods of people living around the forest (416 km²) in Kenya. The project provides an incentive for public participation in forest conservation through a community-based butterfly farming enterprise which ultimately promotes sustainable use of biodiversity resources for improved livelihoods. Butterfly pupae are purchased from the farmers for export to the live butterfly exhibit markets in Europe and the United States. The project has greatly enhanced the level of MEA awareness among the local people around the forest (UNEP, 2012).

Kipepeo Project seeks to demonstrate the tangible link between biodiversity conservation and sustainable livelihoods by shifting forest utilization from consumptive use of forest wood products such as firewood, charcoal and timber which are unsustainable, to non-consumptive commercial use of forest insects especially butterflies and bees, which is sustainable. The initiative has also helped to increase community awareness and national institutions of the ecological and economic importance of insects and their forest habitats by highlighting and demonstrating the direct links

between commercial insects and forest conservation. It has supported conservation and sustainable use of biodiversity within and outside the protected forests by improving forest management through involvement of local communities who depend upon them for their livelihoods. The project has improved peoples' livelihoods by introducing additional or alternative revenue around the forest and minimized the destruction of forest biodiversity (UNEP, 2012). It has also demonstrated how the principles of sustainable development as highlighted in the CBD Obligation 10 (Article 10) can be integrated into policy, programmes and projects in order to avoid or minimize adverse impacts on biological diversity.

7.3.2 Public views on MEA obligations

7.3.2.1 Biodiversity conservation

This study analysed that biodiversity conservation was effective in two MEAs only – the CITES and the CMS. In the CITES, this was because of continuous awareness creation on anti-poaching by the KWS with support of NGOs and international campaigns. For the CMS, the communities may have felt that biodiversity conservation was at a high level because human-wildlife conflicts had increased which, in the minds of the people was because the wildlife population had increased. According to the communities around the CBD, Ramsar Convention and the WHC MEA sites, biodiversity conservation was not effective as the biodiversity was decreasing. This was the case because of the presence of many threats including human-wildlife conflicts and deforestation.

In the case of the CITES, the public stated that biodiversity conservation was taking place because the KWS has been continuously educating the local communities on the benefits of biodiversity conservation especially the elephants and rhinos. With this biodiversity awareness and benefits trickling to the communities, conservation was well taking place (Weru, 2016). Moreover the public also felt that biodiversity conservation was taking place because the MEA institution of KWS together with private land owners and NGOs has been setting up sanctuaries for the protection of rhinos (Kenya Wildlife Conservancies Association [KWCA], 2015; Weru, 2016). The communities also pointed out that the Wildlife Coordination and Management Act (GoK, 2013b) was a key to biodiversity conservation especially in terms of reducing poaching as the Act had very strict penalties on poaching (King, 2013; KWCA, 2015). At the same time the public also emphasized that the KWS and the government had increased their efforts on biodiversity conservation by

signalling a message to the poachers and the world that Kenya would not allow biodiversity trade at the expense of conservation (Weru, 2016).

In the MEA sites of the CMS like the MMNR and Serengeti, the communities also felt that joint patrolling by the KWS with rangers from Tanzania was working well towards wildlife protection. The communities also pointed out that the KWS had been recruiting game rangers and also conducting a strong resource mobilization campaign thus resulting in the increase of biodiversity (Weru, 2016).

7.3.2.2 Identification of biodiversity threats

This study indicated that the communities living around all the MEA sites were able to identify the biodiversity threats associated with the respective sites. In the CBD and WHC MEA sites, the communities have identified poaching as a serious threat to biodiversity conservation. This, they stated was because of lack of enough rangers on the ground and lack of incentives to the communities in terms of safeguarding biodiversity (Weru, 2016). In South Africa's Krugger National Park which is a CBD site, the communities living around have identified poaching of rhinos and elephants as a threat to the park's survival (Roe *et. al.*, 2014).

The communities living around Lake Nakuru National Park, a CBD and Ramsar MEA site have identified human-wildlife conflict as a major threat to the survival of biodiversity. The communities stated that wildlife often penetrated outside the PA resulting in the destruction of property, crops as well as killing or injuring people (Raini, 2009). Other threats to biodiversity as identified by the communities around the lake include deforestation, water pollution, drying up of water bodies and improper waste disposal (*ibid*). Deforestation has also been identified by the local communities living around the CBD sites of the Manquubsa Forest in Ethiopia (Bassi & Tache 2005; 2010) and Benin's Pendjari National Park (Vodouhê *et. al.*, 2010).

Around the Ramsar site of Lake Naivasha, the communities have identified invasive species like the water hyacinth as a threat to the fishing industry (Otianga-Owiti & Oswe, 2007). The local communities feel that if no action is taken to control the invasive species, then the fishing industry would be killed thus increasing poverty (*ibid*). Similarly in Lake Nakuru National Park, the Sodom's

Apple has been highlighted by the communities as a threat to the survival of vegetation. They have further linked the issue of invasive species with climate change (Goodman, 2003).

Studies have shown that with the help of civil societies and NGOs, the recognition by local communities of threats facing their biodiversity and ecosystems is increasing. For example around the Sundarbans mangrove forest of Bangladesh which is a CBD, CMS and a WHC site, the local communities protested against the development of a coal-fired power plant (UNEP, 2011). They felt that the plant would destroy the Sunderbans which is one of the fewest tiger habitats left in the world, affecting the breeding of wildlife and hampering vegetation growth (Siddiqui, 2013). Moreover the communities around the forest have also identified climate change as one of the worst threats to the forest. The super cyclone SIDR of 2007 had a devastating impact on the forest. According to UNESCO, 40% of this WHC site was damaged (UNESCO, 2007).

Contrary to the results of this study, scholars have also indicated that not all communities are able to identify threats in relation to MEA obligations due to poverty and low levels of education (Nyahongo & Røskaft, 2011). For example studies carried out around the Selous Game Reserve in Tanzania by Nyahongo and Røskaft (2011) found that people claimed that lions were devouring people and livestock in the area and most people had the perception that lions which killed life were ghost lions as they had never seen them. This perception had developed because of lack of or low levels of education.

7.3.2.3 *In-situ* conservation

This study found that the public in all the biodiversity MEA sites understood the importance of *in-situ* conservation and were satisfied with the way in which the MEA focal institutions were conducting the conservation. The CITES and the CMS were found to be leading in this strategy and they were closely followed by the CBD, WHC and the Ramsar Convention. This outcome indicated public confidence in Kenya's struggle towards *in-situ* conservation. The findings are similar to those of similar studies in Ghana and Benin. This is because *in-situ* conservation has been a long term strategy in protecting biodiversity. In Ghana, the Akans have preserved the biodiversity in sacred groves for over fifty years (Ntiamoa-Baidu, 1995). Around Benin's Pendjari National Park, the people have been willing to protect the park because it is part of their livelihood

(Vodouhê *et. al.*, 2010) and this is similar to the CBD site of Arabuko Sokoke Forest and the WHC site of Mt. Kenya National Park.

In some instances, studies have established that it is very rare to find communities accepting *in-situ* conservation positively because of the way in which it has been imposed to them. In the command and control (protectionism) approach, people have been forcefully moved out of the land to pave way for PAs (Tumusiime *et. al.*, 2011). In West Africa the Fulani people do not support the creation of PAs because they do not see why wildlife should get better priority than the people's livelihoods (Vodouhê *et. al.*, 2010). This has also been experienced around the Ghodaghodi Lake area of Nepal (Sah & Heinen, 2001); Waza National Park in Cameroon (Bauer, 2003) and PAs of Sumatra in Indonesia (Nyhus *et. al.*, 2003) which are all CBD sites. The people usually retaliate through wildlife killings, poaching, illegal grazing or setting parks on fire (Kideghesho *et. al.*, 2007; Hoole & Berkes, 2010).

In Kenya, the approach towards *in-situ* conservation is slowly changing from state ownership to community and private management. In Kenya the first community conservancy was the Solio Game Ranch which started as early as 1970 (King, 2013) and others like Il Ngwesi and Namunyak in Laikipia followed in the 1990s (Weru, 2016). Since then the communities have realized the benefits of these conservancies which has resulted in the establishment of many new conservancies. The country's legal framework, the Wildlife Conservation and Management Act (GoK, 2013b) has embraced the role of conservancies which will boost the network of sites in the country. By 2012, there were over seventy (70) community conservancies including twenty-two (22) in Kajiado, thirteen (13) in Narok, thirteen (13) in Isiolo, seven (7) in Samburu, five (5) in Baringo, six (6) in Laikipia, two (2) each in Lamu, Marsabit and Taita/Taveta and one (1) each in Kwale, Tana River, Garissa and Wajir (Lekalhaile, 2012).

7.3.2.4 Community involvement in biodiversity management

The findings indicated that most people felt that they had not been adequately involved in biodiversity management including the implementation of biodiversity MEAs. Biodiversity conservation through grassroots programs has become common in developing countries since the 1992 UNCED. This strategy is aimed at encouraging sustainable use of biodiversity and at the

same time alleviating poverty and improving livelihoods (Adams *et. al.*, 2004). Community-based conservation is the best mechanism of involving the public in biodiversity conservation which has been seen by many conservationists as a success model aimed at achieving biodiversity conservation and improving livelihoods (Malla, 2000; 2003).

Zimbabwe has one of the best strategies in involving communities in this area. It set up the CAMPFIRE in 1989 with the help of the country's Department of National Parks and Wildlife Management, WWF, Zimbabwe Trust and the University of Zimbabwe Center for Applied Social Science (Murphree, 1995). The aim of this program is to reduce poverty by conserving wildlife which brings economic development through initiatives like ecotourism and hunting, minimizing conflicts between wildlife and agriculture and increasing the communities' protein intake through the use of wildlife meat. The communities are very happy with this programme as they are benefitting from the wildlife as illustrated in Table 7-17. In order to make biodiversity conservation a success, the communities are trained so that they are aware of which animals to kill for meat, trophy hunting and consumption with an aim of not endangering species (Logan & Moseley, 2001).

Table 7- 17: Community revenue generation from CAMPFIRE programme

Source of benefit from biodiversity	Result
Trophy hunting	The community earns the highest revenue from this CAMPFIRE initiative.
Nature tourism	It is the second major earner for communities after trophy hunting.
Harvesting of natural products	Skins of wild animals like crocodiles and ivory from elephants under the banner "problem animals" are sold.
Live animal sales	In 1994, Gurbue District sold ten roan antelopes and earned US\$ 50,000.
Meat cropping	Abundant wildlife like impala killed for meat and sold.

Source: Africa Resource Trust, 1995

Besides Zimbabwe, Namibia has also adopted the conservancy model of involving communities. Research carried out by Barnes and Humavindu (2003) established that wildlife conservation has not only led to tourism-based activities and better income generation for communities but also promoted sustainable ecologically friendly management which is having a very positive impact on ecosystem conservation.

7.3.2.5 Reducing threats on biodiversity

The public around the CBD, CMS and WHC sites were found to be well aware that the threats to biodiversity had reduced. This was contrary to the findings in the CITES and Ramsar sites. This is

similar to South Africa where the CBD, CITES (Kotze & Du Plessis, 2006), CMS and the WHC (BSP, 1999) are viewed by the public as doing very well. In terms of the CMS and the WHC, South Africa and Botswana were found to have positive public responses on community involvement in biodiversity management. This has been attributed to the transboundary initiatives started in the region over fifty years back and is currently ongoing (BSP, 1999). Cooperation between neighbouring countries has been strengthened by the biodiversity policies of individual countries and institutional capacity especially funding from major donors like the USAID (Van Amerom, 2002).

In Kenya there are a few examples whereby the communities feel that MEA implementation has been effective. At the Coast, the communities living around the Kaya Forests have identified the biodiversity MEA institutions of KFS, KWS and NMK as being the MEA implementors for the CBD and WHC as they have been spreading the message on the importance of these MEA sites. The local communities have expressed their opinion that because of the education aspect, the human-related threats to the Kaya Forests have reduced (IEA, 2011). Another example is of the Arabuko Sokoke Forest, a CBD site where the MEA implementing institutions namely the KFS, KWS and NMK together with the NGOs namely A Rocha Kenya and Nature Kenya are involved in educating communities on the benefit of the MEA site. The communities have analyzed that due to the involvement of these institutions, awareness is increasing and threats to the forest are slowly reducing (A Rocha Kenya, 2008).

In Ghana's Kakum National Park which is a CBD site, the indigenous Akan community had identified deforestation as the main threat to the park. With assistance from Conservation International, the community was educated and made aware of the fact that if the park was destroyed, the community's survival would also be a threat. In 1995 the community got involved in the park's affairs and built a 33 meter high canopy walkway. This has now become a major ecotourism attraction. In 2005, it attracted over 63,000 visitors and in 2012 there were over 171,000 visitors. Over 5,000 tourism-related jobs have been created (Cobbinah, 2015). This shows that with education and empowerment, communities work to implement the CBD and minimize the threats in MEA sites and protect them better.

7.4 SUMMARY

This study has shown that the public views on the importance of biodiversity are very important and should be fully considered for the successful integration of MEA obligations. The findings indicate that education has played a key role in informing the public about the MEAs, MEA institutions, MEA sites and their biodiversity. It has also helped the public identify and reduce threats to the biodiversity in the respective MEA sites. The findings also indicate that the CITES and the CMS were best in implementing the MEAs at community level followed by the CBD and the WHC while the Ramsar Convention was found to be the poorest. Overall, through implementation of biodiversity policies, institutional capacity and education, public involvement in biodiversity conservation can still be improved.

CHAPTER EIGHT

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

8.1 SUMMARY OF FINDINGS

This study examined the domestication and implementation of biodiversity MEAs. It considered the level of effectiveness for the integration and application of the MEAs in national biodiversity policies and biodiversity management institutions in the country. The study also considered the level of MEA awareness among the local communities living around the MEA sites in Kenya. The results indicated that Kenya has only been able to achieve the domestication and implementation of biodiversity MEAs to a certain extent. The study identified policies which had strong domestication in the biodiversity MEAs in Kenya. For the CBD, these were the National Constitution of Kenya (GoK, 2010), Sessional Paper No. 6 on Environment and Development (GoK, 1999), Draft Environment Policy (GoK, 2013a), Wildlife Conservation and Management Policy (GoK, 2012f), Wetlands Conservation and Management Policy (GoK, 2015), Land Policy (GoK, 2009c), Oceans and Fisheries Policy (GoK, 2008), Draft Natural Resources Development and Management Policy (GoK, 2012c), Draft ICZM Policy (GoK, 2007a), Policy for Disaster Management (GoK, 2009e), Policy on Culture and Heritage (GoK, 2009d) and the Policy for the Sustainable Development for Northern Kenya and other Arid Lands (GoK, 2012e). For the CITES, these policies were Wildlife Conservation and Management Policy (GoK, 2012f), Forest Policy (GoK, 2014), Oceans and Fisheries Policy (GoK, 2008), Draft Environment Policy (GoK, 2013a) and the Draft ICZM Policy (GoK, 2007a). The CMS's strength was in the Wildlife Conservation and Management Policy (GoK, 2012f), Environment Policy (GoK, 2013a), Wetlands Conservation and Management Policy (GoK, 2015), Oceans and Fisheries Policy (GoK, 2008), Draft ICZM Policy (GoK, 2007a), the National Constitution of Kenya (GoK, 2010) and Sessional Paper No. 6 on Environment and Development (GoK, 1999). For the Ramsar Convention, the strong policies were the Wetlands Conservation and Management Policy (GoK, 2015), Draft Environment Policy (GoK, 2013a), Wildlife Conservation and Management Policy (GoK, 2012f) and Sessional Paper No. 6 on Environment and Development (GoK, 1999) and for the WHC, these policies were the Wetlands Conservation and Management Policy (GoK, 2015), Wildlife Conservation and Management Policy (GoK, 2012f) and Policy on Culture and Heritage (GoK, 2009d). The Wildlife Conservation and Management Policy (GoK, 2012f), Draft Environment Policy (GoK, 2013a), the National Constitution of Kenya (GoK, 2010) and Sessional Paper No. 6 on Environment and Development (GoK, 1999) were the national

policies which appeared to integrate all five MEAs, followed by the Wetlands Conservation and Management Policy (GoK, 2015) which had integrated in four MEAs.

The study has established that domestication of biodiversity MEAs in Kenya should be considered weak because not all MEA obligations are addressed in the biodiversity policies. Some of the weakest policies include; a) the Forest Policy (GoK, 2014), Draft Fisheries Policy (GoK, 2005a), Tourism Policy (GoK, 2007b) and the Water Policy (GoK, 2012g) for the CBD; b) Sessional Paper No. 6 on Environment and Development (GoK, 1999b), the National Constitution of Kenya (GoK, 2010), Draft Fisheries Policy (GoK, 2005a) and Land Policy (GoK, 2009b) for the CITES; c) the Draft Natural Resources Development and Management Policy (GoK, 2012c) for CMS; d) the National Constitution of Kenya (GoK, 2010) for the Ramsar Convention and e) the Sessional Paper No. 6 on Environment and Development (GoK, 1999b), the National Constitution of Kenya (GoK, 2010), Draft Environment Policy (GoK, 2013a) and Forest Policy (GoK, 2014) for the WHC.

Table 8-1 shows the biodiversity MEA obligations which have been disregarded in the national policies.

Table 8- 1: Summary of poorly integrated MEA obligations in national policies

MEA	Obligations (Relevant articles)
CBD	2. Identification of threats and monitoring status of biodiversity and habitats (Article 7)
	3. Cooperation amongst countries in biodiversity usage and conservation (Article 5)
	4. Developing national strategies, plans and programmes for conservation (Article 6a)
	5. Integrating biodiversity into relevant sectoral and cross sectoral plans, programmes and policies (Article 6b)
	6. <i>In-situ</i> conservation through PAs (Article 8a)
	7. Prevention of alien species (Article 8h)
	8. Innovation, integration of indigenous knowledge and involvement of local communities (Article 8j)
	9. <i>Ex-situ</i> conservation (Article 9)
	10. Cooperation between government and private sector in the sustainable use of bioresources (Article 10)
	11. Research and training for conservation and sustainable use of biodiversity (Article 12)
	12. Implementation of CoP decisions (Article 23)
	13. Public participation, education and awareness (Article 13)
	14. Minimizing impacts on biodiversity with EIAs (Article 14)
	15. Access to genetic resources for equitable sharing through patent and intellectual property rights (Article 15)
	16. Exchange of technology, scientific, socio-economic and indigenous research results (Article 17)
	17. Handling and distribution of biotechnology and distribution of benefits (Article 19)
	CITES
3. Granting of licenses for trading of biodiversity products (Article 6a)	
4. Penalizing prohibited trade (Article 8.1)	
5. Details of traded species, including exporters and importers (Articles 8.6a & b)	
6. Annual progress report to Secretariat (Article 8.7a)	

MEA	Obligations (Relevant articles)
	7. Biennial report to show measures of enforcement (Articles 8.7a & b)
	8. Formation of a management authority to authorize trading permits (Article 9.1a)
	9. Formation of a scientific authority to check on species numbers (Article 9.1b)
CMS	1. Conserving migratory species by restoring and protecting habitats (Article 2.1)
	2. Cooperation with countries to support research of migratory species (Article 2.3)
	3. Enduring to agreements covering conservation of migratory species (Article 5)
	4. Listing of and providing immediate protection to endangered migratory species in Annex 1 (Article 3)
	5. Designation of a national authority to implement agreements and conventions (Article 5.4c)
	6. Coordination of conservation through policies and management plans (Article 5.5b)
	7. Prevention of alien species (Article 5.5e)
	8. Providing new wildlife habitats for migratory species (Article 5.5g)
	9. Removing threats to migratory corridors and migratory species (Articles 5.5h & i)
	10. Community involvement, public awareness and education on the aims of the Convention (Article 5.5n)
Ramsar	1. Designation of wetlands for inclusion in the List of Wetlands of International Importance (Article 1.1)
	3. Formulation and implementation of plans to promote conservation and wise use of wetlands (Article 3)
	4. Research, monitoring and exchanging of data and training (Articles 4.3 & 4.5)
	5. Increasing waterfowl population in wetlands without altering wetlands (Article 4.4)
	6. Consultation and cooperation between countries (in case of shared wetlands), communities and other stakeholders through education, public participation (Article 5 {Amended at CoP 7 in 1999})
	7. Representatives to CoPs to be trained experts in wetlands/waterfowl management (Article 7)
	8. Parties to inform IUCN of every change in the ecological character of wetlands (Articles 3 & 8)
	9. Regular reporting on conservation, management and wise use of wetlands and biodiversity (Article 6)
	10. Establishing natural reserves on wetlands (Article 4)
WHC	2. Adopting policies and plans aimed at natural heritage (Article 5a)
	3. Developing scientific and technical (research) support for heritage protection (Article 5c)
	4. Setting national/regional centres for training personnel in conservation/protection (Article 5e)
	5. Submitting inventory of property on national heritage to World Heritage Committee (Article 11)
	6. State to encourage formation of private foundations to collect donations for heritage conservation (Article 17)
	7. Educational and awareness programmes to appreciate culture in natural heritage (Article 27)
	8. Submission of CoP reports (Article 29)
	9. Cooperation between countries and involvement of local communities (Articles 6 & 7)

Source: Researcher

The assessment of the institutional capacity for implementation of biodiversity MEA showed that for the CBD the strength is in education, working duration of the staff, vehicles and ICT. The CITES and the CMS had the most outstanding institutional strength in education, funding and the working duration span of their staff. Ramsar Convention had good institutional capacity in terms of personnel, vehicles, funding and ICT, while the CITES, CMS and WHC had an average capacity.

This study also analysed the levels of community MEA awareness using gender, education, duration of site residency and distance from MEA sites. The results indicated that education played the most important role in creating public awareness for the CBD, CITES and the Ramsar Convention. In terms of gender and MEA awareness, the males were better aware than their

female counterparts. The level of MEA awareness varied according to the residency duration near the MEA sites with those who had lived shorter periods near the sites having a higher level of awareness which was the expected scenario. In the case of MEA awareness and distance from MEA sites, the level of awareness was found to decrease with increasing distance away from the sites.

The study established that the key biodiversity threats identified by the management institutions were different from those identified by the public.

8.2 CONCLUSION

The study concludes that the domestication and implementation of biodiversity-related MEAs in Kenya is inadequate. There is inadequate integration of biodiversity MEAs in national biodiversity policies based on the overall integration level of 18-25% which indicates a weak integration level compared to other nations. When each MEA was thoroughly scrutinised in terms of visibility in the national policies, the results varied across the various national policies. For the CBD, it was found that the MEA was only domesticated by 40 to 49% in the Forest Policy (GoK, 2014), Draft Fisheries Policy (GoK, 2005a) and Tourism Policy (GoK, 2007b) with less than 40% integration in the Water Policy (GoK, 2012g). The CITES was only integrated in the Sessional Paper No. 6 on Environment and Development (GoK, 1999) and the National Constitution of Kenya (GoK, 2010) by only 40 to 49%. It was very weakly integrated in the Draft Fisheries Policy (GoK, 2005a) and Lands Policy (GoK, 2009c) by less than 40%. For the CMS, national domestication weakness were found in the Draft Natural Resources Development and Management Policy (GoK, 2012c) (<40%) and Ramsar Convention (<40%) in the National Constitution of Kenya (GoK, 2010). The WHC is poorly integrated between in the Environment Policy (GoK, 2013a) and Sessional Paper No. 6 on Environment and Development (GoK, 1999) by 40 to 49% and extremely poorly integrated in the National Constitution of Kenya (GoK, 2010) and the Forest Policy (GoK, 2014) at less than 40%. The biodiversity MEAs which are least integrated in national biodiversity policies are the CMS, Ramsar Convention and the WHC.

With regard to institutional capacity, the study established that the number of personnel in-charge of implementing the MEAs at most focal institutions were very small and inadequate. This inadequacy was also common to the site offices. However, the study established that all the MEA

focal institutions had highly qualified MEA personnel mostly with postgraduate degrees. The level of funding for the implementation of biodiversity MEAs was found to be inadequate with some like the CBD and the WHC being allocated an annual budget of only US\$ 17,000 or less. There is inadequate capacity in terms of vehicles. On the overall all MEAs had average capacity with the Ramsar Convention having the best institutional capacity, followed by the CBD.

In terms of public awareness and satisfaction on the implementation of MEAs, it was established that majority of the people are aware but not completely satisfied with the quality of implementation. The results indicate a positive relationship between the level of MEA awareness and education. When the MEA awareness was associated with gender, the overall indication was that the males were more aware than the females. In addition, the level of MEA awareness was better for shorter duration of residence near the MEA sites which was contrary to the expected scenario. This was the case because the message of MEAs had spread in the last few years. The overall results on the level of MEA awareness and distance from MEA application sites indicated that awareness was decreasing with increase in distance. This was the case because of establishment of educational institutions near the MEA sites. In terms of the threats facing biodiversity management, this study established that there was a disconnect between biodiversity managers and the general public.

8.3 RECOMMENDATIONS

8.3.1 Enactment of draft policies and amendments of gazetted policies to align with MEA obligations

This research has established that Kenya has many good policies which are still in the draft form, including the Environment Policy (GoK, 2013a), Natural Resources Development and Management Policy (GoK, 2012c), Fisheries Policy (GoK, 2005a) and the ICZM Policy (GoK, 2007a). These draft policies ought to be finalized and strengthened in terms of the relevant MEA obligations.

At the same time, most enacted policies require amendments in line with the MEA obligations by filling the obligation gaps. The policies requiring amendments in order to effectively domesticate the CBD are the Wildlife Conservation and Management Policy (GoK, 2012f), Environment Policy (GoK, 2013a), Land Policy (GoK, 2009c), Policy for the Sustainable Development for Northern Kenya and other Arid Lands (GoK, 2012e), Oceans and Fisheries Policy (GoK, 2008), Tourism

Policy (GoK, 2007b), Water Policy (GoK, 2012), Policy for Disaster Management (GoK, 2009e), Forest Policy (GoK, 2014), Policy on Culture and Heritage (GoK, 2009d) and Sessional Paper No. 6 on Environment and Development (GoK, 1999).

8.3.2 Institutional capacity for the implementation of biodiversity MEAs

There is need to increase national biodiversity MEA experts and funding so as to improve the country's institutional capacity especially at the KWS which is the focal institution for the CITES, CMS and Ramsar Convention, followed by the CBD.

8.3.3 MEA education and awareness

The Ministry of Education should ensure a higher integration of biodiversity MEAs in the curriculum especially within tertiary educational institutions dealing with environment and natural resources in order to raise the level of awareness and boost the capacity for implementation of the MEAs in Kenya. The MEWNR and Ministry of Education should partner with the media in creating MEA awareness, as this will help in reducing the decay in MEA awareness levels with distance from the MEA sites.

8.3.4 Community involvement in MEA implementation

In order to see the effectiveness of MEA awareness at grassroots levels, the communities should be involved in decision making as well as income generating and sharing opportunities like development of tourist facilities.

8.4 AREAS OF FURTHER RESEARCH

The following gaps were identified as possible areas for further research:-

- a. Institutional capacity needs assessment for implementation of biodiversity MEAs in Kenya;
- b. Assessment of the level of integration for biodiversity MEAs in the management plans and programmes for state PAs in Kenya;
- c. Comparative analysis on the implementation status for biodiversity MEAs by government and non-state actors, including NGOs and CBOs and
- d. Other biodiversity MEAs should be evaluated for integration into policies, management plans and implementation in Kenya.

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LIST OF ANNEXES

Annex 1Ai: Questionnaire for residents around the study sites of CBD, CMS, Ramsar Convention and WHC

QUESTIONNAIRE NO _

MEA SITE _____

SECTION A – Personnel information:

NAME _____

SEX _____

DATE _____

1. Since how long have you been staying here?

- a. 0-5 years b. 6-10 years c. 11-15 years d. more than 16 years

2. How far is your home from the lake/ park?

- a. 0-1 km b. 1-2 km c. 2-3 km d. over 3 km

3. In which way has the park/lake benefitted you and the community?

SECTION B – Education background

4. What is your level of education?

- a. primary b. secondary c. university d. informal e. none

5. What is your occupation?

- a. farmer b. fisherman c. hunter d. businessman
e. pastoralist f. boatsman g. hotelier i. guide

SECTION C – Protected area details

6a. Since the time you came to stay here, has there been biodiversity conservation? Yes/no

b. If yes, has biodiversity:-

- a. decreased b. increased

7a. Are you aware that this lake (park) is protected by an international convention? Yes/no

b. If yes, explain how you knew. _____

8a. Is there a local (provincial) body which takes care of the lake and the animals in and around it?

Yes/no

b. If yes, what is it called? _____ c. Which one has been the most successful? _____

d. Has this body done any projects in which you have participated? _____

9. Are you happy with the work of the MEA institutions in the conservation of the place? Yes/no

10. With protection from national bodies, communities and NGOs, have the number of fish, crocodiles and other animal species in and around the protected area increased? Yes/no If yes, which ones have increased? _____ If no, which ones have decreased? _____

11i. If you have any problems like human-wildlife conflict or the lake showing some strange signs, to whom do you report?

- a. KWS b. DC c. ranger d. NEMA e. fisheries f. KFS g. none

ii. If answer to the above is g, then why?

- a. too scared to report b. don't know to whom to report c. no focal point office

12. What are the problems and threats facing the MEA site? _____

13. How can the MEA site be improved to reduce threats?

- a. Government to preserve the lake/park b. private sectors getting involved in the protection
c. local residents initiative d. education

14. Do you, as the indigenous and resident communities, have an input in the management decisions? Yes/no

Annex 1Aii: Questionnaire for residents around the study sites of CITES

QUESTIONNAIRE NO _

MEA SITE _____

SECTION A – Personal information:

NAME _____

SEX _____

DATE _____

1. Since how long have you been staying here?
a. 0-5 years b. 6-10 years c. 11-15 years d. more than 16 years
2. How far is your home from the lake/ park?
a. 0-1 km b. 1-2 km c. 2-3 km d. over 3 km
3. Are you aware that this is MEA designated site? Yes/No
4. In which way has border point benefitted you and the community?

SECTION B – Education background

5. What is your level of education?
a. primary b. secondary c. university d. informal e. none
6. What is your occupation?
a. farmer b. fisherman c. hunter d. businessman e. pastoralist
f. boatsman g. hotelier i. guide

SECTION C – Protected area details

7. Since the time you came here, have the authorities found illegal wildlife products? Yes/no
8. What are the illegal items found?
a. rhino horns b. ivory c. bush meat d. Genetically Modified Organisms (GMO) seeds
e. invasive species f. endangered wood like sandal wood
9. How many times have the authorities found illegal products?
a. 1-5 times b. 6-10 times c. over 10 times
10. Are you aware that this border point is protected by an international convention? Yes/no
11. Which institution has created the awareness of the border point being protected by an international convention? A. KWS b. KAA c. KPA d. KFS e. NMK
f. KMFRI g. border patrol
12. Are you happy with the work of the MEA institutions (authorities) in catching poachers? Yes/no
13. According to you, which institution has been successful in enforcing/stopping illegal trade in wildlife? ____
14. a. Are there any spies who help the border security to identify smugglers? Yes/no
b. Are these spies effective? Yes/no
15. Do you think that more can be done to strengthen the security here? Yes/no
16. What are the threats contributing towards illegal smuggling at the border point? _____
17. Do you, as indigenious and resident communities, have an input in the management decisions? Yes/no

Annex 1B: Questionnaire for officers at national focal and MEA site institutions

QUESTIONNAIRE NO _

SECTION A – Personal information:-

NAME _____ DATE _____ GENDER _____

1. For which institution are you working for?
a. KWS b. KFS/KEFRI c. NMK d. NEMA e. KMFRI
2. What is your academic qualification?
a. secondary b. first degree c. postgraduate diploma d. masters e. PhD
3. How long have you been working with this institution?
a. less than 1 year b. 1-5 years c. 6-10 years d. over 10 years
4. What is your position here?
a. director b. scientist/researcher c. site inspector d. official
5. Does the institution send you for training on MEAs and the CoPs? Yes/no
6. How long are the MEA based training programmes? A. 1 day b. between 2-5 days c. more than 5 days

SECTION B – Systemic capacity

7. Which government policies do you use to implement the MEAs? _____
8. Which government frameworks do you use? _____
9. a. Do you have any plans/strategies you use to improve the sites? Yes/no
b. Name the strategies/plans you have for this MEA/MEA site. _____
10. Do you have any planned educational programmes for the local communities around the MEA sites? Yes/no

SECTION C – Institutional capacity

11. When was this office set up? _____
12. How many computers do you have for this MEA? _____
13. How many vehicles do you have for this MEA? _____
14. Do you have funding? Yes/no
15. a. How much funding do you have per annum for this MEA? _____
b. Where do you get your funding from? A. NGOs b. Government c. MEA based international institutions d. private cooperatives and individuals
16. Do you submit CoP reports to the MEA secretariat as required or annual reports to the MEA national office? Yes/no

SECTION D – Individual capacity

17. How many staff do you have for this MEA? _____
18. Are they all trained to handle the MEA? Yes/no
19. Who is the main person in-charge of this MEA? Director/senior scientist

SECTION E – Site related questions

20. Have you been able to safeguard biodiversity in respected MEA areas? Yes/no
21. Rank the threats to the MEA protected areas in the order of the greatest threat.

Annex 2: Population of selected divisions as per MEA case studies

A. Arabuko Sokoke Forest – CBD site

County/Sub-county	Division	Location	Sub-location	Male	Female	Total	House holds
Malindi	Malindi	Gede	Mida	3159	3376	6535	850
			Mijomboni	2744	2804	5548	766
			Dabaso	6550	6497	13047	2444
			Mkenge	2216	2257	4473	566
Total				14669	14934	29603	4626
Malindi	Langobaya	Jilore	Girimacha	710	847	1557	234
			Jiore/Ziani	1470	1630	3100	484
			Kakoeni	2066	2425	4491	709
<i>Total</i>				4246	4902	9148	1427
Kilifi	Sokoke	Vitengeni	Magogoni	2109	2558	4667	703
			Nyari	2297	2566	4863	683
			Rare	1223	1481	2704	407
Total				5629	6605	12234	1793

B. Lake Nakuru National Park – CBD and Ramsar site

County/Sub-county	Division	Location	Sub-location	Male	Female	Total	House holds
Nakuru	Lanet	Lanet	Kiamunyeke	2644	1823	4467	793
			Mwariki B	4782	5155	9937	2486
		Free Area	Menengai	8892	9780	18672	5139
		Lanet	Muguga	2445	2427	4872	1370
Total				18763	19185	37948	9788
Nakuru	Municipality	Kaptembwo	Mwariki	12045	12551	24596	8022
			Githima	8653	9336	17989	5182
		Viwanda	London	7500	5455	12955	3315
			Vivanda	2061	2135	4196	1297
		Bondeni	Milimani	3222	3210	6432	1640
			Afraha	8916	9922	18838	5162
			Baharini	8354	8724	17078	4829
Kivumbini	10221	10353	20574	6148			
Total				60972	61686	122658	35595
Molo	Njoro	Nessuit	Nessuit	3687	3585	7272	1469
			Sigotik	2223	2007	4230	881
			Misepei	1019	967	1086	394
		Njoro	Njoro	19591	20079	39670	10149
			Mukungugu	5559	5521	11080	2899
		Kihingo	Kihingo	5168	5526	10694	2579
			Lusiruo	1858	2096	3954	909
Total				39105	39781	77986	19280

C. Lake Bogoria National Reserve – Ramsar site

County/Sub-county	Division	Location	Sub-location	Male	Female	Total	House holds
Baringo	Marigat	Loboi	Maji Ndege	541	518	1059	237
			Chelaba	546	540	1086	209
		Ngambo	Sintaan	990	989	1979	361
			Ngambo	1704	1643	3347	588
		Ewalel Soi	Koition	292	280	572	133
		Kimondis	Ketemwa	343	319	662	169
		Salaban	Meisori	1398	1451	2849	618
			Salaban	944	971	1915	345
		Kapkuikui	Kaptombes	300	281	581	118
		Marigat	Endao	593	553	1146	258
			Perkerra	3706	3745	7451	1822
		IlChamus	Kailer	329	380	709	123
			Eldume	1284	1354	2638	546
		Marigat	Yatoi	2171	2222	4393	1209
		IIng'agua	Lonewan	629	613	1242	235
			IIng'agua	653	668	1321	238
		Kimalael	Koriema	943	984	1927	483
			Kimalael	495	474	969	207
			Sabor	703	663	1366	356
		Sandai	Mbechot	672	702	1374	230
Sandai	590		616	1206	226		
Total				19826	19966	39792	8711
Koibatek	Mogotio	Lembus Mogoto	Chemogoch	1037	980	2017	380
			Kipsogon	2051	1988	4039	790
		Ngubereti	Ngubereti	648	636	1284	246
			Legetetwet	326	375	701	141
		Molosiriwe	Chepyuan	521	512	1033	192
			Molosiriwe	583	537	1120	214
		Simotwe	Mugurin	990	910	1900	316
		Kamar	Molos	223	236	459	89
			Kamar	351	353	704	137
		Kapkechui	Moguyuni	545	492	1037	215
			Kibomoi	407	358	765	159
			Turkulu	499	477	976	172
			Mogotio Town	2530	2671	5201	1308
Koabos	Maji Moto	495	504	999	182		
	Koituimet	601	40	1241	236		
Total				10770	10089	21459	4397

D. Lake Naivasha – Ramsar site

County/Sub-county	Division	Location	Sub-location	Male	Female	Total	House holds
Nyandarua South	Kinangop North	Engineer	Gathara	5051	5211	10262	2399
			Murungaru	7147	7562	14709	3352
			Kahuru Muruaki	10226	10577	20803	4990
		Kinangop North	Kinja	4065	4449	8514	2151
			Kitiri	4269	4288	8557	1821
			Mikaro	1617	1675	3292	679
			Mkungi	4339	4580	8919	1928
Total				36714	38342	75056	17320
Naivasha	Naivasha	Naivasha East	Maraingushu	5996	6138	12134	2807
			Kinamba	4504	4631	9135	2314
			Mununga	3187	3370	6557	1446
		Hells Gate	Oi Karia	13011	12426	25437	9194
			Mirera	19554	19655	39209	12953
		Karati	Gatamaiyu	2465	2449	4919	1199
			Karati	5094	3208	8302	1409
		Lake View	Lake View	9950	10132	20082	6714
		Malewa	Tarambete	4432	4267	8699	2845
		Naivasha Town	Sokoni	22317	23226	45543	15657
Total				90510	89502	180017	56538
Naivasha	Kongoni	Moi Ndabi	Moi Ndabi	1647	1605	3252	952
			Ndabibi	4527	3871	8398	2361
		Maiela	Kongoni	2054	2050	4104	1209
			Maiela	4416	4804	9220	2124
Total				12644	12330	24974	6646

E. Maasai Mara National Reserve – CMS/WHC site

County/Sub-county	Division	Location	Sub-location	Male	Female	Total	House holds
Narok South	Mara	Aitong	Marariada	2488	1841	4329	944
			Aitong	3107	3326	6433	1355
		Koiyaki	Koiyaki	2994	2503	5497	1170
			Sekenani	1681	1513	3194	706
		Siana	Megwara	2039	2389	4428	949
			Nkoilale	2885	2533	5418	1225
			Siana	4054	4065	8351	1765
		Olderkesi	Esoit	2944	3328	6272	1269
			Olderkesi	1954	2250	4204	864
		Naikara	Leshuta	1688	1859	3547	739
			Osarara	983	1138	2121	450
			Naikara	3046	3318	6364	1299
		Ol Kinyei	Endoinyo Narasha	2042	2227	4269	896
			Ol Kinyei	1479	1691	3170	634
Total				33384	33981	67597	14265

F. Mt. Kenya National Reserve/Park – WHC site

County/ Sub-county	Division	Location	Sub-location	Male	Female	Total	House holds
Embu	Manyatta	Kathangariri	Rugumu	1680	1659	3339	834
			Nguviu	2883	2979	5862	1552
		Ngandori East	Kirigi	1639	1671	3310	926
			Rianjagi	1166	1241	2407	647
			Kamviu	1058	1085	2143	581
			Manyatta	1375	1658	3033	743
			Kariari	1032	1075	2107	603
		Kibugu	Ngerwe	1376	1432	2808	714
			Gicherori	2244	2180	4424	1197
			Kibugu	1440	1415	2855	740
		Mbuvore	Mbuvore	4540	4683	9223	2149
		Ngandori West	Mukangu	1239	1268	2507	651
			Kithungururu	1326	1300	2626	658
			Karruri	1469	1550	3019	789
		Ruguru	Kithunguriri	1390	1512	2902	739
			Kiamwinja	527	528	1055	264
			Kirirari	1623	1791	3414	912
			Mukuria	999	1029	2028	489
		Gaturi North	Itonguri	1987	2172	4159	1191
			Kathangari	984	903	1887	511
			Kianjuki	2216	2278	4494	1165
			Itonguri	1987	2172	4159	1191
		Total			36180	37581	73761
Laikipia East	Central	Nturukuma	Nturukuma	2177	2157	4334	1213
			Likii	3037	3060	6097	2189
		Marura	Nyambogichi	946	888	1834	507
		Nanyuki	Thingithu	6935	7200	14135	4200
			Majengo	9537	8517	18054	5391
		Segera	Segera	1916	1994	3910	981
			Ngare Ngiro	1186	848	2034	824
		Impala	Rugutu	1179	1246	2425	621
Total			26913	25910	52823	15926	

Data Source: KNBS, 2009

Annex 3: Biodiversity policies of Kenya

1. Sessional Paper No. 6 on Environment and Development (GoK, 1999)
2. Draft National Fisheries Policy (GoK, 2005)
3. National Tourism Policy (GoK, 2007)
4. Draft Integrated Coastal Zone Management Policy (GoK, 2007)
5. National Oceans and Fisheries Policy (GoK, 2008)
6. National Land Policy (GoK, 2009)
7. National Policy for Disaster Management (GoK, 2009)
8. National Policy on Culture and Heritage (GoK, 2009)
9. The Constitution of Kenya (GoK, 2010)
10. National Water Policy (GoK, 2012)
11. National Wildlife Conservation and Management Policy (GoK, 2012)
12. National Policy for the Sustainable Development for Northern Kenya and other Arid Lands (GoK, 2012)
13. Draft Natural Resources Development and Management Policy (GoK, 2012)
14. Draft Environment Policy (GoK, 2013)
15. National Forest Policy (GoK, 2014)
16. National Wetlands Conservation and Management Policy (GoK, 2015)

Annex 4: Summary of the level of integration of biodiversity MEA obligations in national policies

MEAS		CBD	CITES	CMS	Ramsar	WHC
Policy	Relevant biodiversity policy prescriptions	√		√	√	√
National Constitution of Kenya (GoK, 2010)	Article 69: Environment and natural resources					
	• Ensuring sustainable exploration, utilization, management and conservation of natural resources and equitable sharing of benefits.	√	√	√	√	√
	• Eliminating processes and activities that are likely to endanger environment.	√	√	√	√	√
	• Supporting public participation in land management on principles of equitability, efficiency, productivity and sustainability.	√	√	√	√	√
	• Encouraging public participation in management, protection and conservation of the environment.	√		√	√	√
	• Supporting transboundary EIAs for transboundary activities and projects.	√		√	√	√
Total	Prescriptions	5	3	5	5	5
Wildlife Policy (GoK, 2012f)	Section 3: Guiding principles and values					
	Sub-section 3.2: Objectives and priorities					
	• Conserving Kenya's wildlife resources as a national heritage.	√				√
	• Conserving and maintaining wildlife populations in Kenya.	√				√
	• Developing methodologies for effective assessment and monitoring of wildlife in the country.	√				√
	• Promoting positive attitudes towards wildlife conservation and management.					√
	Section 4.0: The national wildlife conservation and management policy framework and approach					
	• Identifying, managing and protecting wildlife ecosystems through integrated ecosystem management plans.	√		√		
	• Ensuring land will be set aside where wildlife has a priority.			√		
	• Mainstreaming wildlife conservation into the national landuse system.			√		
	• Mainstreaming EIA to minimize impacts on species, habitats and ecosystems.	√		√		√
	• Providing incentives to promote wildlife conservation and management.					√
	Sub-section 4.2: Ecosystem and habitat management					
	• Setting contingency plans for monitoring ecosystems and threats in wildlife conservation.	√		√	√	√
	• Identifying and protecting wildlife ecosystems through stakeholder integrated ecosystem management plans.	√				√
• Identifying, designating and protecting linkage zones between isolated habitats, migratory routes, corridors and dispersal areas through participation and innovative schemes like leases and management agreements.	√		√		√	
• Adopting ecosystem-based approach to wildlife conservation within/outside PAs.	√		√		√	
Section 5: Wildlife conservation and management of PAs						
Sub-section 5.2: Terrestrial PAs						
• Developing mechanisms for benefit sharing with communities living next to PAs.	√		√			
• Developing, gazetting and implementing management plans through participatory processes.	√		√		√	

MEAS	CBD	CITES	CMS	Ramsar	WHC
• Ensuring each local authority develops/implements an integrated ecosystem management plan.	√				
• Strengthening ecological network of national parks and reserves by designating buffer zones and linking zones such as wildlife migratory corridors and dispersal areas.	√		√		√
• Maintaining and developing existing PAs and establishing new PAs with stakeholder/community involvement.	√				√
• Establishing joint management by having new PAs under community and private sector involvement.	√		√		√
• Ensuring that local authorities have a participatory framework for local communities residing within wildlife conservation areas to participate in wildlife conservation.	√				√
• Building capacity for local authorities' personnel for effective conservation and management.	√				
Sub-section 5.3: Marine Protected Areas (MPAs) and ecosystems					
• Protecting, maintaining and restoring species, habitats and ecosystems of national/international importance.	√		√		√
• Developing MPA strategy in line with the national and international ICZM strategy.	√				√
• Managing MPAs through management plans on critical feeding and nesting grounds of marine species.	√		√		
• Promoting the establishment of community-based marine conservation areas.	√		√		
• Establishing collaborative management that enhances local community involvement.	√				
• Undertaking and supporting research and training.	√		√		√
• Promoting regional cooperation for marine migratory species of conservation importance.	√	√	√		√
• Collaborating and participating in implementing coastal and marine-related Disaster Action Plans.	√		√		√
Section 6.0: Wildlife conservation and management outside PAs and sanctuaries					
Sub-section 6.1: Community wildlife conservation areas and sanctuaries					
• Promoting joint ventures in conservation and management of wildlife.	√				√
• Supporting the establishment of wildlife conservation areas.	√				√
• Supporting and participating in formulation and implementation of a National Land Use Policy.	√		√		
• Supporting conservation education, public awareness and capacity building amongst local communities, schools and other interested groups.	√		√		√
• Supporting landowners/communities to set aside wildlife conservation areas and sanctuaries.			√		√
Section 7: Research and monitoring					
Sub-section 7.1: Scientific research, information management and monitoring					
• Promoting scientific research and monitoring for planning and management decision-making.	√		√		√
• Conducting regular population and Habitat Viability Assessments to know the species status.	√		√	√	√
• Enhancing the use of indigenous knowledge in conservation and management of wildlife.	√		√		√
• Coordinating research activities and strengthening capacities within KWS and other institutions.	√		√		√
• Supporting/coordinating research activities and strengthening capacities of research institutions.			√		√
• Analyzing and disseminating research results of wildlife conservation to all including the public.			√		√

MEAS	CBD	CITES	CMS	Ramsar	WHC
<ul style="list-style-type: none"> Establishing a comprehensive wildlife database at management levels for use in policy, conservation planning and management decision-making processes. 					√
Sub-section 7.3: Wildlife disaster preparedness, response and rescue					
<ul style="list-style-type: none"> Developing and implementing a wildlife disaster preparedness and response strategy. 	√				√
Section 8: Sustainable management of wildlife resources					
Sub-section 8.1: Species					
<ul style="list-style-type: none"> Developing measures for endangered and threatened species that are shared with countries. 	√	√	√		
<ul style="list-style-type: none"> Developing/implementing management strategies/plans for keystone and indicator species. 	√		√		√
<ul style="list-style-type: none"> Establishing/updating framework for identifying and listing endangered and threatened species. 	√	√			√
<ul style="list-style-type: none"> Developing mechanisms for designating critical habitats by listing species of conservation concern. 	√		√	√	
<ul style="list-style-type: none"> Putting in place mechanisms for identifying, controlling and eradicating invasive species. 	√		√	√	√
<ul style="list-style-type: none"> Establishing and maintaining facilities for <i>ex-situ</i> conservation to complement <i>in-situ</i> measures. 	√				√
<ul style="list-style-type: none"> Putting in place mechanisms for <i>ex-situ</i> conservation. 	√				
<ul style="list-style-type: none"> Regulating the importation of exotic species, re-introduction of species. 	√				
<ul style="list-style-type: none"> Developing mechanisms to regulate selling, donation/gifts of wildlife to or from any country. 		√			
<ul style="list-style-type: none"> Regulating international trade in wildlife in line with Kenyan and international instruments. 	√	√			
<ul style="list-style-type: none"> Preventing and controlling illegal utilization of wildlife with local, national and international law agencies. 	√	√			
<ul style="list-style-type: none"> Developing recovery plans for conservation and survival of endangered and threatened species. 			√		√
<ul style="list-style-type: none"> Establishing an effective framework for identifying and listing endangered/threatened species. 			√		
Sub-section 8.2: Wetlands, rivers and lakes ecosystems					
<ul style="list-style-type: none"> Developing and implementing wetlands management plans. 				√	
<ul style="list-style-type: none"> Restoring degraded wetlands, riverbanks, lakeshores and constructed wetlands. 				√	√
<ul style="list-style-type: none"> Supporting and implementing National Wetlands Conservation and Management Policy. 				√	√
<ul style="list-style-type: none"> Mapping wetland areas that are significant wildlife habitats countrywide. 				√	
<ul style="list-style-type: none"> Supporting conservation and management of wetlands. 				√	√
<ul style="list-style-type: none"> Supporting development of wetland management plans through participatory process. 				√	√
<ul style="list-style-type: none"> Supporting restoration of degraded wetlands and establishing constructed wetlands. 				√	√
Sub-section 8.3: Wildlife user rights					
<ul style="list-style-type: none"> Identifying and prioritizing viable wildlife user rights, species and potential areas. 	√				√
<ul style="list-style-type: none"> No sport hunting allowed until mechanisms for equitable benefits sharing are developed. 	√				
<ul style="list-style-type: none"> All wildlife users to be responsible for maintaining wildlife habitat in wildlife conservation areas. 	√				
<ul style="list-style-type: none"> Preventing and controlling illegal wildlife use with national/international law enforcement agencies. 	√				
<ul style="list-style-type: none"> Supporting and promoting local communities, landowners in sustainable wildlife utilization. 	√				
<ul style="list-style-type: none"> Putting in place mechanisms for partnerships between conservation institutions and other stakeholders. 	√				

MEAS	CBD	CITES	CMS	Ramsar	WHC
• Ensuring benefits from genetic resources like intellectual property rights, traditional knowledge and technology are shared equitably with communities living near PAs where genetic material originated.	√				
• Subjecting cropping to verified scientific information and developing benefit sharing framework.	√				
• Subjecting all wildlife user rights to responsibilities to develop and maintain wildlife habitat.			√		
• Subjecting wildlife user rights to develop/maintain wildlife habitat leading to/within wildlife conservation areas.			√		
• Promoting development and implementation of management plans for all conservation areas.			√		
Sub-section 8.4: Bioprospecting and access to genetic resources					
• Regulating and sustainably managing bioprospecting.	√				
• Ensuring bioprospecting in PAs is governed by Access and Benefit Sharing (ABS) requirements in line with the CBD, Cartagena Protocol on Biosafety and Bonn Guidelines.	√				
Article 8.5: Wildlife security					
• Coordinating and strengthening wildlife security in wildlife conservation areas.	√	√	√		
• Putting in place mechanisms for wildlife censuses.	√				
• Strengthening collaboration with national/international law enforcement agencies in wildlife crimes.	√	√			
• Putting in place regulatory framework, disciplinary code for control and management of wildlife security countrywide.		√	√		
• Establishing and building capacity of local communities in bolstering security in wildlife conservation areas.	√	√	√		
• Establishing transparent mechanisms for management/monitoring of wildlife security agents countrywide.		√			
• Establishing and supporting devolved wildlife management institutions.	√				
Section 9.0: Human-wildlife conflict and compensation					
• Ensuring that land use based on Ecosystem Management Plans is practiced in conservation areas.			√		
Section 10.0: Legal and institutional framework					
Sub-section 10.1: Wildlife sector legal reforms					
• Incorporating/domesticating provisions of relevant wildlife-related MEAs to which Kenya is a party.	√	√	√		
Sub-section 10.2: Institutional arrangements					
• Facilitating management contracts between KWS and stakeholders for sustainable management of wildlife.		√			
• Establishing wildlife department at the responsible ministry to have oversight role in wildlife policy formulation and monitoring policy implementation in relation to other sectoral policies.		√	√		
• Restructuring and strengthening KWS as designated national institution for implementation of wildlife policy.		√	√		
• Strengthening National Environment Tribunal for wildlife disputes in line with EMCA/related laws.			√		
• Putting comprehensive wildlife law on conservation and wildlife management to implement this policy.			√		
Sub-section 10.3: Human resources development and capacity building					
• Enhancing networking between centres of excellence in wildlife conservation nationally/internationally.	√	√	√	√	√
• Enhancing wildlife conservation capacity and regulating wildlife conservation professionals.	√				√

MEAS		CBD	CITES	CMS	Ramsar	WHC
	• Restructuring KWS Training Institute to provide skills to wildlife managers.					√
	• Developing training opportunities for wildlife staff.					√
	Section 11: Strategies					
	Sub-section 11.1: Incorporation of wildlife considerations into sectoral policies					
	• Ensuring cross-sectoral and inter-sectoral coordination and policy integration of wildlife-related sectors.	√				
	• Promoting development/implementation of legal instruments between KWS and agencies benefitting from wildlife resources.	√		√		
	Sub-section 11.2: Wildlife conservation education, communication and public awareness					
	• Promoting indigenous knowledge in the conservation and management of wildlife resources.	√				√
	• Building capacity of wildlife committees/regional conservation associations to deliver educational programmes.	√				√
	• Promoting public awareness and understanding of wildlife conservation education.			√	√	√
	• Developing/implementing national conservation curriculum with Kenya Institute of Education (KIE).	√		√	√	√
	• Ensuring that KNEC includes examinable wildlife courses in primary and secondary schools.	√		√		
	• Developing a national website on wildlife conservation.	√		√		√
	Sub-section 11.4: Youth					
	• Educating youth on environmental, economic and socio-cultural values of wildlife resources.	√		√	√	
	• Empowering youth to conserve wildlife by providing tools, mechanisms and opportunities.	√				
	Sub-section 11.7: Regional and international obligations					
	• Promoting the establishment of transboundary and/or transfrontier wildlife conservation areas.	√	√	√		√
	• Honouring requisite contributions relating to wildlife-related MEAs to which Kenya is a Party.	√	√	√	√	
	• Supporting/participating in wildlife-related MEAs and ensuring implementation of international obligations.			√	√	
Total	Prescriptions	72	18	54	17	53
Sessional Paper No. 6 on Environment and Development (GoK, 1999b)	Article 4. 1: Biological diversity					
	• Identifying rare and endangered species by setting up more biosphere reserves, national parks and reserves, botanical gardens, arboreta and through their propagation and captive breeding.	√	√	√		
	• Coordinating development and implementation of a NBSAP.	√		√		√
	• Developing and maintaining an inventory of all vital habitats, biodiversity, preparing conservation plans.	√		√		√
	• Promoting research into all alien species which could threaten biodiversity.	√		√		
	• Encouraging participation of local communities through incentives in biodiversity conservation.	√		√		
	• Supporting research and development of genetic diversity in wildlife species, disease free crops, indigenous and commercial vegetative crops and genetic conservation for fish and domestic animals.	√				
	• Reviewing intellectual property rights and harmonizing legislation in relation to biotechnology.	√				
	• Developing a comprehensive research and development policy in biotechnology and bio-safety.	√				

MEAS	CBD	CITES	CMS	Ramsar	WHC
• Formulating scientific criteria and developing bio-safety guidelines for biotechnological products.	√				
• Encouraging studies on genetic engineering and biotechnology with technological innovations.	√				
Article 4.2: Land and land-based resources					
• Providing advice on sustainable land use practices in various agro-ecological zones.	√				
• Introducing measures to protect and preserve forests rich in biodiversity.	√		√		√
• Promoting wildlife utilization as an alternative form of livelihood.	√				
• Identifying and protecting important watersheds in forest areas.	√				√
• Encouraging sustainable utilization, conservation and management of all forest lands.	√				√
• Discouraging inappropriate conversion of ASALs into agriculture.	√				
• Promoting integration of wildlife and livestock management.	√				
• Encouraging and supporting traditional land use practices that are environmentally friendly.	√				
• Encouraging land management techniques which promote sustainable environmental management.	√				
• Establishing mechanisms to monitor and assess the rate and extent of land degradation.	√				
• Developing drought and desertification monitoring and early warning systems.	√				
• Developing a comprehensive policy on rangeland resources management.	√				√
• Formulating a drought preparedness policy.	√				
• Developing national monitoring programme with socio-economic data and documenting indigenous knowledge.	√				
• Developing a policy on sustainable management of mountain ecosystems.	√				√
• Devising programmes for generating/strengthening scientific knowledge of mountain ecosystems.	√				√
• Reviewing landuse policies to enhance existing policies on conservation/management of soil.	√				
• Reviewing the existing Forest Policy.	√				√
• Reviewing the law relating to forestry development.	√				
• Reviewing the wildlife policy and legislation.	√				√
• Involving public in developing and implementing environmental policies and programmes.	√		√	√	
• Involving local communities and providing legal recognition to forest conservation and management.	√				
• Involving local communities to develop mechanisms in benefitting from wildlife earnings.	√				
• Promoting community participation and incorporating international obligations.	√		√		
• Encouraging collaboration between stakeholders in the development of ASALs.	√				
• Promoting research into and adoption of appropriate land use systems and technology.	√				
• Undertaking research on various landuses, water conservation and improved extension services.	√				
• Strengthening research capacity and technology for conservation and management of wildlife.	√				
• Promoting research for interaction between fauna and flora while maintaining ecological balance.	√				

MEAS	CBD	CITES	CMS	Ramsar	WHC
• Promoting educational programmes on environment, landuse and development.	√				
• Creating awareness on drought and desertification and introducing mitigations through training, outreach programmes and seminars.	√				
• Making EIA a requirement in all development projects and programmes affecting forests.	√				
• Institutionalizing EIA for all programmes and projects in wetlands.	√				
• Reviewing mining legislations to incorporate environmental considerations, particularly EIA.	√				
Article 4.3: Water resources					
• Protecting marine environment from oil spillage and waste dumping.	√				√
• Protecting water catchment areas through conservation and management laws.	√			√	√
• Supporting development of integrated management plans for sustainable use of wetlands.	√			√	
• Formulating a national policy on the management and conservation of wetlands.	√			√	√
• Establishing, maintaining inventory of wetlands to identify maps and prescribe existing wetland resources.				√	
• Promoting community participation in wetlands conservation and management and incorporating obligations under international treaties, conventions and agreements.				√	
• Institutionalizing EIA for all programmes and projects in wetlands.				√	
• Strengthening the study of ecology of wetlands.				√	
• Developing an integrated fisheries management plan.	√		√		√
• Developing a fresh water and marine resources management strategy.	√				√
• Encouraging/promoting local communities in management of fisheries and marine resources.	√				
Article 4.4: Energy resources					
• Making EIA mandatory for all energy projects and programs.	√				
Article 4.5: Atmospheric resources					
• Undertaking impact assessment on climate change and its implications.	√				
• Cooperating in global studies on climate change.	√				
Article 4.10: Human settlements					
• Regulating urban development to only those areas which are suitable and avoiding wetlands.				√	
Article 4.17: Environment and land-use practices					
• Developing guidelines relating to landuse in environmentally fragile areas including wetlands.	√			√	
Section 7: Human resource development					
Article 7.2: Public awareness and environmental education					
• Involving local communities and the informal sector in dissemination of environmental education.	√		√		
• Promoting utilization of indigenous knowledge in environmental education.	√				
• Supporting and providing in-service courses on environmental management.	√				
• Involving mass media to provide environmental information.	√		√		

MEAS		CBD	CITES	CMS	Ramsar	WHC
	• Preparing information packs for use in educational institutions and at other levels of the society.	√		√		
	• Developing programmes and strategies to disseminate information on environmental activities.	√		√		
	• Incorporating environmental education in schools, colleges and universities as a mandatory subject.	√		√		
	Article 7.3: Cooperative development and environment					
	• Developing education and public awareness programmes for sustainable natural resource use.	√		√		
	• Developing collaborations on environmental education between ministries and other environment sectors.	√		√		
	Article 7.4: Environmental information systems					
	• Promoting use of appropriate indigenous knowledge, skills, technology and practices.	√				
	Section 8: Environmental governance					
	Article 8.1: Environmental laws					
	• Formulating a framework on the environment for environmental offences and penal sanctions.		√			
	Article 8.2: EIA					
	• Formulating comprehensive EIA guidelines, procedures and legislation.	√				
	• Strengthening and developing environmental standards.	√				
	• Establishing a system of EIA audits, monitoring, evaluation and appeal.	√				
	• Subjecting new and existing projects and programmes to environmental monitoring and auditing.	√				
	• Strengthening capacities in institutions and local communities with regard to EIA.	√				
	• Incorporating social and cultural values in EIA.	√				
	Article 11: Environment, research and technology					
	• Developing a comprehensive research and technology policy with environmental concerns.	√				√
	• Formulating bio-safety policies and regulations.	√				
	Article 12: Coordination and participation					
	• All stakeholders to partner in promoting environmental planning, utilization, conservation and protection.	√				
	Article 13: Regional and international cooperation					
	• Continuing to participate in formulating/implementing regional/international treaties, conventions, agreements and protocols relevant to the environment.	√				
	Article 14: Environmental management authority					
	• Establishing environment protection court to handle matters relating to the environment.		√			
Total	Prescriptions	75	3	16	10	16
Draft Environment Policy (GoK,	Section 3: Guiding principles					
	• An integrated ecosystem approach to be used in conserving environmental resources.	√		√		√
	• Utilizing environmental resources in a sustainable manner.	√				
	• Managing the environment and natural resources equitably for future generations.	√				

MEAS		CBD	CITES	CMS	Ramsar	WHC
2013a)	Section 4: Management of ecosystems and sustainable use of natural resources					
	Sub-section 4.1: Forest ecosystems					
	• Protecting and conserving forests located in key water catchment areas.	√				√
	• Developing national strategy for rehabilitation and restoration of degraded ecosystems.	√				√
	Sub-section 4.2: Freshwater and wetland ecosystems					
	• Promoting sustainable use of freshwater and wetland resources through river basin management plans.	√			√	√
	• Developing and implementing integrated wetland and water resources management strategies and plans.	√			√	√
	• Promoting and institutionalizing schemes to support catchment protection and conservation.	√			√	
	• Developing and implementing a national wetland policy and regulations.				√	√
	• Mapping wetland areas countrywide.				√	
	• Developing and implementing catchment-based wetland management plans for Ramsar sites.				√	
	• Ensuring rehabilitation and restoration of degraded wetlands and promoting constructed wetlands.				√	
	• Harmonising and coordinating agencies with management of freshwater/wetland ecosystems.				√	
	Sub-section 4.3: Coastal and marine ecosystems					
	• Promoting sustainable use of marine resources and conservation of vulnerable coastal ecosystems.	√		√		√
	• Promoting international cooperation for conservation of marine migratory species.	√	√	√	√	
	• Developing and implementing ICZM Policy, Strategy and Action Plan.	√		√		
	• Undertaking research and training on coastal and marine ecosystems and resources.	√		√	√	
	• Promoting international cooperation for marine migratory species.	√				
	Sub-section 4.4: Mountain ecosystems					
	• Developing and implementing strategies and action plans for sustainability of mountain ecosystems.	√		√		√
	Sub-section 4.5: ASALs ecosystems					
	• Implementing National Action Plan to combat desertification and revitalize the Desertification Trust Fund.	√				√
	• Promoting integrated natural resource management in ASALs.	√				
	Sub-section 4.6: Land					
	• Promoting and enhancing best practices for sustainable land use.	√				
	• Ensuring implementation of the constitution and Land Policy for sustainability of land resources.	√				
	• Promoting and supporting establishment of environmentally significant areas.	√				
	Sub-section 4.7: Soils					
	• Ensuring protection of wetlands, riverbanks, hilltops and slopes from unsustainable practices.	√				
• Developing and implementing a National Soil Conservation Action Plan.	√					
Sub-section 4.9: Biodiversity						
• Regulating and encouraging sustainable utilization and bioprospecting of biological resources.	√					
• Revising and implementing the NBSAP.	√		√		√	

MEAS	CBD	CITES	CMS	Ramsar	WHC
• Developing and implementing a strategy to contain, control and mitigate invasive species.	√		√	√	
• Promoting establishment of transboundary wildlife conservation areas for conservation of shared wildlife resources and their ecosystems through relevant regional bodies.			√		
• Encouraging/supporting the establishment of community-based conservation areas to expand PA network.			√		
• Maintaining/expanding PAs, reclaiming and restoring encroached parks and reserves for wildlife conservation.			√		
• Strengthening/supporting wildlife research and monitoring to generate information for decision making.			√		
Sub-section 4.10: Wildlife resources					
• Protecting, conserving and improving habitats, corridors and dispersal areas of wildlife.	√		√		√
• Strengthening and supporting wildlife research and monitoring for decision making.	√				
• Promoting the establishment of transboundary wildlife conservation areas.	√	√			
• Encouraging and supporting the establishment of community-based conservation areas.	√				
• Expanding conservation areas to win more space for wildlife.	√				
Sub-section 4.12: Fisheries					
• Promoting sustainable management and utilization of fishery resources.	√				
• Promoting sustainable aquaculture development.	√				
• Developing mechanisms ensuring that benefits from access to genetic resources, intellectual property rights, and traditional knowledge are shared equitably with communities in areas where the genetic material originated.	√				
• Establishing and implementing a fishery resources monitoring system.	√				
Sub-section 4.13: Natural capital					
• Ensuring cross-and inter-sectoral coordination into sectoral policies, programmes and plans.	√				
Section 5.0: Environmental stewardship					
Sub-5.1: Trade and environment					
The government to be:					
• Ensuring that environment issues are integrated into international trade negotiations and domesticated.		√			
Section 6: Environmental quality and health					
• Promoting Environmental Health Impact analysis as a component of EIA for development projects.	√				
Section 7: Research, education and monitoring					
Sub-section 7.1: Scientific research and information management					
• Developing national data and information management policy on environmental and biological resources.	√		√		√
• Enhancing integration of traditional knowledge in environmental planning and management.	√				
• Supporting research and transferring knowledge and technologies for environmental well being.	√			√	
Sub-section 7.2: Education, communication and awareness					
• Documenting, disseminating and encouraging use of indigenous knowledge in conservation.	√				

MEAS		CBD	CITES	CMS	Ramsar	WHC
	• Developing a national strategy on environmental education and public awareness.	√		√		
	• Developing national environmental education curriculum examinable at all levels.	√		√		
	Section 8.0: Environmental governance					
	Sub-section 8.1: Environmental legal reforms					
	• Enhancing and promoting environmental management network at the national and international levels.		√			
	• Strengthening NEMA as a national institution for supervision/coordination in all environmental matters.			√		
	• Promoting establishment of transboundary environmental conservation and management initiatives for shared resources/ecosystems through relevant MEAs/regional instruments			√		
	• Establishing/strengthening coordination for implementation and reporting of MEAs/regional agreements.			√		
	• Harmonizing regional policies dealing with environmental resources.			√		
	Sub-section 8.6: Regional and international cooperation					
	• Government to be strengthening coordination mechanisms for implementing/reporting of MEAs.		√		√	
	• Promoting and supporting establishment of transboundary environmental protection, conservation and management initiatives through relevant MEAs and regional instruments.	√	√	√	√	
	• Supporting and participating in wildlife-related MEAs and ensuring implementation of obligations.	√			√	
	Section 9: Implementation of actions and strategies					
	Sub-section 9.1: Integration of environmental concerns in policy, planning and development processes					
	• Ensuring that all significant development projects are subjected to EIA.	√				
Total	Prescriptions	44	6	21	15	12
Forest Policy (GoK, 2014)	Objective 2: Collaborative management					
	• Publishing an annual state of the forest report.	√	√			
	• Promoting management of forests for biodiversity conservation.	√				√
	Objective 3: User rights					
	• Introducing benefit sharing arrangements in forest management agreements and forest licences.	√	√			
	• Preparing participatory forest management plans with community forestry associations.	√				
	• Recognizing/protecting customary rights of indigenous peoples/communities within/adjacent to forests.	√				
	Objective 4: Maintaining tree and forest cover					
	• Establishing national community forest programme to assist communities prepare/implement management plans.	√				
	Objective 5: Forestry on community and private land					
• Encouraging communities to sustainably manage forests for water, biodiversity and soil conservation.	√					
• Supporting community forest management approaches to manage dryland forests for sustainable production of wood and non-wood forest products.	√					
Objective 6: Partnerships						
• Developing/implementing national chain-of-custody system to track imports and exports.	√	√				

MEAS		CBD	CITES	CMS	Ramsar	WHC	
	<ul style="list-style-type: none"> Encouraging adoption of legal origin/compliance certificates and labeling forest products for all markets. 	√	√				
	<ul style="list-style-type: none"> Encouraging private sector participation in the establishment and management of forest plantations. 	√					
	Objective 9: Research, education and public awareness						
	<ul style="list-style-type: none"> Supporting public awareness campaigns. 	√					
	<ul style="list-style-type: none"> Strengthening institutional capacity for acquisition, packaging and dissemination of forest information. 	√					
	<ul style="list-style-type: none"> Enhancing/promoting network between forest education and research centres at national/international levels. 	√					
	Objective 10: Cross-cutting development issues						
	<ul style="list-style-type: none"> Providing opportunities/incentives for women to enter into forest training. 	√					
	Objective 11: Enhanced cooperation						
	<ul style="list-style-type: none"> Establishing mechanisms to ensure cross-sectoral linkages and effective domestication, monitoring and reporting of forest-related MEA and regional agreements. 	√	√				
	<ul style="list-style-type: none"> Supporting harmonization of regional forest resource policies. 	√	√				
	<ul style="list-style-type: none"> Promoting the establishment of trans-boundary forest resource management agreements. 	√	√				
Total	Prescriptions	18	7	0	0	1	
National Wetlands Conservation and Management Policy (GoK, 2015)	Section 1.0: Introduction						
	<ul style="list-style-type: none"> Establishing institutional policies and frameworks for integrated management/wise use of wetlands. 				√		
	<ul style="list-style-type: none"> Enhancing and maintaining wetland functions and values in order to protect biodiversity. 				√	√	
	<ul style="list-style-type: none"> Promoting communication, education and public awareness among stakeholders. 				√	√	
	<ul style="list-style-type: none"> Improving scientific information and knowledge base on Kenyan wetland ecosystems. 				√		
	<ul style="list-style-type: none"> Strengthening institutional capacity on conservation and management of wetlands. 				√		
	<ul style="list-style-type: none"> Promoting innovative planning and integrated management approaches towards wetlands conservation. 				√		
	<ul style="list-style-type: none"> Promoting cooperation at international levels for transboundary wetlands/migratory species. 				√		
	<ul style="list-style-type: none"> Promoting ecosystem-based approach to manage wetlands especially biodiversity hot spots. 				√	√	
	<ul style="list-style-type: none"> Promoting conservation of wetlands of religious and cultural significance. 				√	√	
	Section 2: Challenges and strategies in wetland conservation and management						
	Sub-section 2.1: Challenges and threats						
	<ul style="list-style-type: none"> Promoting sustainable extraction and utilization of goods and services from wetlands. 	√			√		
	<ul style="list-style-type: none"> Any alteration of wetlands to be subjected to approved standard procedures including EIA. 	√			√		
	<ul style="list-style-type: none"> Reclamation and conversion of wetlands will not be allowed. 				√		
	<ul style="list-style-type: none"> Government to harmonize wetland riparian zones/setback limits for wetland ecosystems. 				√		
	Sub-section 2.1.2: Overexploitation of wetland goods and service						
<ul style="list-style-type: none"> Promoting sustainable extraction and utilization of goods and services derived from wetlands. 				√			
<ul style="list-style-type: none"> Promoting environmental friendly alternative livelihood activities in line with the wise use principle. 				√			

MEAS	CBD	CITES	CMS	Ramsar	WHC
Sub-section 2.1.3: Pollution, eutrophication and salinization of wetlands					
• Supporting and promoting enforcement of relevant regulations and laws related to environmental pollution.				√	
Sub-section 2.1.4: Alien and invasive species					
• Undertaking research, public education and awareness campaigns on alien species.	√		√	√	√
• Developing and implementing a national strategy and action plan for invasive species.	√		√	√	√
• Plant species that negatively impact wetlands to be replaced with wetland plants.			√	√	
• Uncontrolled burning of wetland biomass will be prohibited.			√	√	
• Building capacity for sustainable wetlands management and conservation.			√	√	
• Dumping of waste in wetlands to be disallowed; disposal sites close to wetlands will be subjected to EIA.			√	√	
Part 2.1.5: Restoration and rehabilitation of degraded wetlands					
• Making use of locally available appropriate technology and involving local communities where possible.	√			√	
• Promoting recognition and application of traditional indigenous knowledge in wetland management.	√			√	
• Giving priority to indigenous vegetation and other biodiversity in restoring degraded areas.				√	
Sub-section 2.2: Conservation and management					
• Regulating, protecting, managing and conserving all wetlands in line with the constitution.	√			√	√
• Cooperating with neighboring countries for sustainable management of wetlands and equitable sharing.	√			√	
• Developing regional approaches and policies for sustainable management of transboundary wetlands.	√			√	
• Developing and implementing management plans through a participatory process.	√			√	√
• Promoting education and awareness on wetland resources to encourage stakeholder participation through cultural practices.	√		√	√	√
• Incorporating wetland conservation and management into national environmental education strategy.	√		√	√	√
• Adopting/implementing measures for continuous generation, storage and dissemination of scientific information and using the same for planning and decision making.	√			√	
• Identification of other wetlands for gazettelement as internationally important areas.				√	√
Sub-section 2.2.3: Wetlands of international importance					
• Identifying and listing wetland sites that fulfill Ramsar Convention criteria.				√	
• Ensuring effective management and conservation of all Ramsar sites.				√	
Sub-section 2.2.4: Restoration and rehabilitation of degraded wetlands					
Developing and implementing measures for:					
• Giving priority to indigenous vegetation and other biodiversity in restoring degraded areas.				√	
• Allowing natural regeneration of degraded wetlands where feasible.				√	
• Making use of locally available appropriate technology where possible.				√	
• Putting in place monitoring frameworks to ensure maintenance of integrity and functions.				√	

MEAS		CBD	CITES	CMS	Ramsar	WHC
	Sub-section 2.2.5 Manmade wetlands					
	• Promoting use of constructed wetlands for wastewater management in industries/agriculture etc.				√	
	• Establishing/sustainably managing man-made wetlands for food production, water supply etc.				√	
	Sub-section 2.2.6: Transboundary wetlands					
	• Cooperating with neighboring countries bilaterally and developing regional frameworks for implementing harmonized policies and strategies for sustainable management of wetlands.				√	√
	• Developing regional approaches and policies for sustainable management of transboundary wetlands.				√	
	Section 2.3: Research, education and awareness					
	Sub-section 2.3.1: Inventorying, monitoring and information systems					
	• Establishing, maintaining and updating a standardized county and national wetlands database.				√	
	Sub-section 2.3.2: Capacity and human resource development					
	• Building capacity for sustainable wetlands management and conservation.	√			√	
	• National and county governments to develop strategies for implementation of Wetland Policy.	√			√	√
	• Instituting measures and mechanisms to manage within and across counties.				√	√
	• Instituting legal mechanisms for access to wetland genetic resources.				√	
	• Identifying, strengthening resources to implement National Wetlands Policy.				√	
	Section 3: Legal and institutional arrangements					
	Sub-section 3.2: Resource mobilization					
	• Allocating and mobilizing adequate resources and guidelines to all stakeholders to support conservation and management of wetlands including Payment for Ecosystem Services and eco-tourism.	√			√	
	Section 4.0: Sector linkages at national and international levels					
	Sub-section 4.1: Coordination with related policies					
	• Instituting an appropriate mechanism for harmonization of sectoral policies relating to wetlands.	√			√	
	Sub-section 4.2: Promoting international obligations					
	• Ensuring all provisions of relevant conventions and agreements are domesticated and implemented.	√			√	
	• Ensuring synergy and coordinated national approach in MEAs implementation relating to wetlands.				√	
Total	Prescriptions	18	0	8	52	14
Land Policy (GoK, 2009b)	Chapter 3: Land tenure issues					
	Section 3.3.4: Resource tenure policy					
	• Developing strategies for sharing benefits.	√				
	• Conserving the environment through ecosystem protection and EIAs.	√				
	• Developing a comprehensive resource tenure policy.	√				
	• Ensuring recognition of traditional knowledge related to land-based resources.	√				
	• Recognizing and protecting the rights of natural resources dependent communities.	√				

MEAS		CBD	CITES	CMS	Ramsar	WHC
	Sub-section 3.3.4.1: Conservation and sustainable management of land-based natural resources					
	• Undertaking a survey of all critical ecosystems to determine sustainable land uses.	√				
	• Facilitating partnership with neighbouring countries to foster transboundary management.	√	√			
	• Developing comprehensive and integrated land use policy with regard to fragile areas.	√				
	• Initiating and supporting the preparation of an integrated coast resource management plan.	√				
	Sub-section 3.4.1.1: National and regional planning					
	• Developing national and regional physical development plans for local land use practices.	√				
	Section 3.4.3: Environmental management principles					
	• Developing measures for rehabilitating forest resources and recognizing traditional management systems.	√				
	• Ensuring that EIAs and audits are carried out on all land developments.	√				
	Sub-section 3.4.3.2: Ecosystem protection and management principles					
	• Encouraging development of wildlife sanctuaries and involving local communities in the co-management.	√				
	• Putting in place participatory stakeholder mechanisms for management of fragile ecosystems.	√				
	• All land uses and practices must conform to land use plans and principles of biodiversity protection.	√				
	Section 3.6.3: Pastoral land issues					
	• Providing negotiated cross-boundary access to PAs among different stakeholders.	√				
	Section 3.6.4: Land issues peculiar to Coast region					
	• Protecting and conserving the Tana and Sabaki Delta ecosystems.	√				
	• Providing a framework for sharing benefits from land and land-based resources.	√				
Total	Prescriptions	18	1	0	0	0
National Policy for the Sustainable Development for Northern Kenya and other Arid Lands (GoK, 2012e)	Chaper 5: Policy elements					
	Sub Section 5.1.1: High level of regional inequality and underdevelopment					
	• Introducing education systems of high quality, which are responsive to the needs of the area and reinforcing traditional knowledge systems in pastoral societies.	√				
	Sub-section 5.4.2: Land and natural resource management					
	• Protecting and increasing vegetation and water catchment areas in the ASALs.	√				
	• Ensuring that economic development protects the environment and delivering maximum benefits to communities in the region and to Kenya.	√				
	• Eradicating undesirable invasive species such as <i>prosopis</i> .	√				
• Reinforcing the authority of traditional natural resource management systems.	√					
• Protecting and promoting indigenous knowledge, environmental education and awareness.	√					
Total	Prescriptions	6	0	0	0	0
National Oceans and	Sub-section 2.7: Improvement of infrastructure and human resource development					
	• The Ministry responsible for fisheries shall enhance training of fisheries personnel.	√				

MEAS		CBD	CITES	CMS	Ramsar	WHC
Fisheries Policy (GoK, 2008)	Sub-section 2.9: Cross-cutting Issues • Integrated approach in order to develop the welfare of fisher communities including research.	√				
	Sub-section 3.3: Management and conservation • Government to promote conservation and management of fisheries resources.	√				
	Section 4: Policy statements Sub-section 4.1: Research and development • Use of ecosystem approach with the operational management plans for fishery with research.	√		√		
	Sub-section 4.2: Resource management • Research with regional and distant water fishing nations in harvesting stocks and managing sustainability.	√	√			
	• Use of ecosystem-based approach in the management of resources.	√		√		
	• Cooperation with regional states and distant water fishing nations in harvesting these stocks.	√				
	• Aquaculture research to focus on development, species and genetic improvement, culture systems, management techniques; social, economic and EIA and any other relevant area.	√		√		
	Sub-section 4.6: Regional and international agreements and cooperation • Government to cooperate with other states, local stakeholders for the better development of fishing.	√	√			
	Section 5: Strategies Sub-section 5.1: Research and development In collaboration with local and international partners, the Government will be: • Taking measures to ensure research is conducted in all aspects of fisheries including biological research, ecology, technology, environmental science, socio-economics, aquaculture and oceanography.	√	√	√		
	• Promoting research and development of aquaculture.	√				
	Sub-section 5.2: Resource management • Government to encourage cooperation with international organizations in managing migratory and shared stocks.	√	√	√		
	Sub-section 5.13: Public awareness and participation • Government to be promoting information, communication and outreach programmes.	√		√		
	Sub-section 5.5: Monitoring control and surveillance (MCS) • Monitoring and ensuring safe exploration of the ocean resources.	√				
	• The Government to be proactively participating in international MCS initiatives to ensure sustainable and responsible utilization of shared/highly migratory stocks.	√	√			
	Sub-section 5.6: Regional and international agreements and cooperation • International collaboration on MCS, scientific research, management and trade.	√	√			
Sub-section 5.8: Institutional framework • Improving effectiveness of government by creating Kenya Oceans Fisheries Council, Kenya Oceans and Fisheries Services and linking KMFRI to do research to guide technical arm.		√				

MEAS		CBD	CITES	CMS	Ramsar	WHC
	Sub section 5.10:Trade and commerce <ul style="list-style-type: none"> Trading in fish/fish products in line with international rules-the principles, rights and obligations established in the agreement on CITES and the technical barriers to trade. 		√			
Total	Prescriptions	16	8	6	0	0
Draft Fisheries Policy (GoK, 2005a)	Section 2: Policy framework for realization of the objectives Sub-section 2.3: Achievement of efficient and effective fisheries management <ul style="list-style-type: none"> With the advice of Kenya Fisheries Development Authority (KFDA), the ministry to be regularly reviewing fines, penalties and fees levied on offences, access and trading in fish and fishery products. 		√			
	<ul style="list-style-type: none"> The KFDA and the department of fisheries to adopt co-management. 		√			
	Sub-section 2.10: Regional and international cooperation and collaboration <ul style="list-style-type: none"> International cooperation and collaboration in research and development. 	√	√			
Total	Prescriptions	1	3	0	0	0
Draft Natural Resources Development and Management Policy(GoK, 2012c)	Section 4: Natural resource valuation and audit <ul style="list-style-type: none"> Integrating natural resource impact assessment when abstracting natural resources. 	√				
	Section 6: Framework principles and values <ul style="list-style-type: none"> Equitable sharing of natural resources amongst communities. 	√				
	<ul style="list-style-type: none"> Using ecosystem approach to conserve natural resource base. 	√				
	Section 10: Statement of policy action and plans <ul style="list-style-type: none"> Developing education and public awareness programmes for sustainable natural resources use. 	√		√		
Total	Prescriptions	4	0	1	0	0
Tourism Policy (GoK, 2007b)	Sub-section 3.12: Regional and international corporation <ul style="list-style-type: none"> Kenya to support implementation of EAC agreement for biodiversity conservation and management. 	√				
	Section 4.0: Implementation strategy and roles of stakeholders Sub-section 4.1: Institutional and regulatory framework <ul style="list-style-type: none"> Enforcing need for mandatory EIAs for all significant new tourism developments. 	√				
	<ul style="list-style-type: none"> Development and implementation of a Coastal Area Management Plan. 	√				
	<ul style="list-style-type: none"> Supporting the formulation and developing guidelines on EIA for the tourism industry. 	√				
	<ul style="list-style-type: none"> Establishing close working relations and collaboration with public and private stakeholders for protection of natural and cultural resources and investment. 	√				
	<ul style="list-style-type: none"> Working with local communities to develop community-based tourism projects. 	√				
	<ul style="list-style-type: none"> Providing support to community projects through expertise and skills development assistance. 	√				
Total	Prescriptions	7	0	0	0	0
Draft ICZM Policy	Section 2: Critical ecosystems and habitats <ul style="list-style-type: none"> Pollution monitoring and enforcement mechanisms to minimize releases in marine environment. 	√				

MEAS	CBD	CITES	CMS	Ramsar	WHC	
(GoK, 2007a)	• Developing and effectively implementing oil spill contingency plan.	√		√		
	• Establishing a multi-zone strategy for ICZM.	√		√		
	• Level of exploitation to be linked to the best available indigenous knowledge and scientific information.	√		√		
	• Strengthening mechanisms for undertaking EIA and Environmental Management Plans.	√		√		
	• Strengthening <i>in-situ</i> legislation through ecosystem-based management.	√		√		
	• Revising fisheries policies to adopt an ecosystem-based approach.	√		√		
	• Increasing knowledge base through scientific research and monitoring of coral reef ecosystems.	√		√		
	• Taking of inventory.	√		√		
	Section 3: Mangrove forests					
	• Developing and supporting mangrove training, education and awareness programmes.	√		√		
	• Identifying traditional usage of mangroves and wetland management.	√		√		
	• Developing management plan at ecosystem and site level.	√		√		
	Section 4: Coastal forests					
	• Promoting forest management partnerships with all stakeholders.	√		√		
	• Strengthening conservation of critical forest habitats by gazetting them as PAs.	√		√		
	• Enhancing public awareness on forest values and increasing community participation.	√		√		
	• Documenting and enhancing application of indigenous knowledge in coastal forest management.	√		√		
	• All Kayas and sacred sites to be preserved as national monuments.	√		√		
	Section 5: Sea grass beds					
	• Enhancing community awareness on values and functions of sea grass beds.	√		√		
	Section 6: Deltas and estuaries					
	• Enhancing enforcement of EIA in river basin development.	√		√		
	Section 7: Policy on MPAs					
	• Extending the mandate of MPAs to include critical habitats outside MPAs.	√		√		
	• Strengthening the stakeholders and involving/enhancing community participation.	√		√		
	• Penalties of poaching endangered species.	√	√	√		
	Section 8: Policy on species of special concern					
	• Carrying out inventory of species of special concern and developing management guidelines.	√		√		
	• Conserving and protecting critical habitats.	√		√		
	• Regulating trade in sea turtles.	√	√	√		
	• International cooperation to ensure protection of species of special concern.	√	√	√		
	Section 9: Policy on fisheries					
	• Awareness, education and stakeholder involvement on shells' collection and enforcement to control corals.	√		√		
• Development and implementation of management plans.	√		√			

MEAS		CBD	CITES	CMS	Ramsar	WHC
	Section 12: Community issues					
	• Restoring traditional values on sustainable management of natural resources and heritage.	√		√		
	• Public participation, awareness and strengthening community participation in resource management.	√		√		
	Section 14: Access and benefit sharing					
	• Local people to be represented in decision making committees.	√		√		
	• Grassroots consultation, awareness raising and involvement in decisions and development planning.	√		√		
	• Creating equitable distribution of accrued revenue.	√				
	Total Prescriptions	33	3	31	0	0
National Water Policy (GoK, 2012g)	Chapter 2: Water resources management					
	• Maximizing use of transboundary water resources in coordination with other riparian countries.	√				
	• Developing a water management system contributing to the protection of the environment.	√				
	• Ensuring restoration and protection of ecological systems and biodiversity in strategic water catchments.	√				
Total Prescriptions	3	0	0	0	0	
National Policy on Culture and Heritage (GoK, 2009c)	Chapter 1: Role of government					
	• Government to ensure protection and promotion of the country's national heritage.					√
	Sub-section 1.3: Rationale for the Cultural and National Heritage Policy					
	• Government shall take measures for the protection, conservation and preservation of tangible and intangible national heritage within its boundaries.	√				√
	Sub-section 1.8: Culture and environment					
	• Government with stakeholders to assist in sustainable management, preservation and conservation of culture, heritage and development using indigenous knowledge, modern techniques and methods.	√				
	Chapter 2: Culture and heritage					
	Sub-section 2.1 Tangible cultural heritage					
	• Government to assist in promotion of cultural heritage of Kenya by encouraging, preserving, sustaining and disseminating knowledge of traditional and contemporary tangible culture.	√				
	• Government recognition of research in promotion and preservation of tangible culture and taking necessary steps to facilitate and encourage research in all tangible aspects of culture.	√				
• Government to ensure use of tangible cultural heritage into creation of wealth and jobs.	√					
• Government to preserve cultural landscapes that testify to creative genius, social development and imaginative spiritual vitality of humanity, all of which are part of Kenya's cultural identity.	√					
• Government shall be committed to the prevention of illicit trafficking of protected objects.	√					
• Government to establish institutions to ensure conservation and promotion of Kenya's immovable heritage.	√				√	
• Government to encourage local communities' participation in planning/management of sites.	√					

MEAS		CBD	CITES	CMS	Ramsar	WHC
	<ul style="list-style-type: none"> Government to encourage sustainable projects in areas with immovable heritage for contribution to people's social welfare, improved quality of life and sustainable development. 	√				
	Chapter 8: Education					
	<ul style="list-style-type: none"> Government to encourage research in culture and also document and disseminate the findings. 	√				
	<ul style="list-style-type: none"> Government to encourage capacity building and training in all departments dealing with culture. 	√				
	Chapter 10: Capacity building					
	<ul style="list-style-type: none"> Government to facilitate international cooperation and bilateral linkages. 					√
	Chapter 11: Implementation strategy					
	<ul style="list-style-type: none"> Establishing National Council of Culture and Heritage to implement National Culture and Heritage Policy. 	√				
	Chapter 12: Funding					
	<ul style="list-style-type: none"> Government to source funding through consolidated fund and formation of private foundations. 					√
	Chapter 13: Institutional and administrative framework					
	<ul style="list-style-type: none"> Education, Wildlife and Environment Ministries to be integrated into the Government action plan for the implementation of the Culture and Heritage Policy. 	√				√
Total	Prescriptions	14	0	0	0	6
National Policy for Disaster Management (GoK, 2009d)	Sub-section 2.1: Current disaster management plan					
	<ul style="list-style-type: none"> Mainstreaming disaster management and climate change into planning and sustainable management. 	√				
	Section 3: Current disaster management initiatives					
	Sub-section 3.2: Goals and objectives					
	<ul style="list-style-type: none"> Providing society participation in disaster management by integrating traditional coping strategies. 	√				
	<ul style="list-style-type: none"> Ensuring institutions/activities for disaster risk management are coordinated, focused to foster participatory partnerships between government and other national/international stakeholders. 	√				
	<ul style="list-style-type: none"> Making institutional provisions to ensure education training and capacity building; mainstreaming disaster management education and functional literacy in all educational institutions. 	√				
	<ul style="list-style-type: none"> Sensitizing awareness creation and functional literacy to the public. 	√				
	<ul style="list-style-type: none"> Involving affected communities in planning, implementing and evaluating disaster interventions. 	√				
Total	Prescriptions	6	0	0	0	0

Source: Researcher

Annex 5A: CBD integration status for policies

CBD obligations	Policies																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Average	
1.Conservation, sustainable use and equitable sharing of biodiversity (Article 1)	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2.Identifying threats and monitoring status of biodiversity and habitats (Article 7)	40	68	10.5	31.8	0	11.8	5.6	16.7	6.3	100	25	0	50	33.3	0	7.1	25.4	
3.Cooperation amongst countries in biodiversity usage and conservation (Article 5)	20	8.3	5.3	11.4	16.7	5.9	11.1	16.7	37.5	100	0	28.6	25	33.3	16.7	0	21.0	
4.Developing national strategies, plans and programmes for conservation (Article 6a)	80	69.4	28.9	36.4	16.7	41.2	33.3	16.7	24	100	25	28.6	50	33.3	33.3	14.3	39.4	
5.Integration of biodiversity into relevant, sectoral and cross sectoral plans, programmes and policies (Article 6b)	40	19.4	23.7	18.2	0	11.8	16.7	33.3	18.8	0	25	28.6	12.5	0	0	7.1	15.9	
6. <i>In-situ</i> conservation through PAs (Article 8a)	100	43.1	3.9	20.5	0	11.8	22.2	33.3	0	0	0	0	6.1	33.3	0	7.1	17.5	
7.Prevention of alien species (Article 8h)	60	4.2	1.3	2.3	0	11.8	0	16.7	0	0	25	0	0	0	0	0	7.6	
8.Innovation, integration of indigenous knowledge and involvement of local communities (Article 8j)	100	25	18.4	11.4	50	17.6	33.3	50	6.35	0	50	57.1	25	0	50	28.6	32.7	
9. <i>Ex-situ</i> conservation (Article 9)	20	2.8	2.6	0	0	0	0	0	0	0	0	0	0	0	0	0	1.6	
10.Cooperation between government and private sector in the sustainable use of bioresources (Article 10)	60	4.2	1.3	2.3	33.3	17.6	22.2	0	6.3	100	25	14.3	3	0	16.7	7.1	19.6	
11.Research and training for conservation and sustainable use of biodiversity (Article 12)	40	23.6	9.2	6.8	33.3	5.9	0	0	37.5	100	0	0	25	0	16.7	28.6	20.4	
12.Implementation of CoP decisions (Article 23)	0	1.4	1.3	2.3	0	0	0	0	0	0	0	0	0	0	0	0	0.3	
13.Public education and awareness, participation (Article 13)	60	16.7	29.4	11.4	16.7	11.8	5.6	33.3	6.3	0	100	0	18.1	0	33.3	7.1	21.8	
14.Minimizing impacts on biodiversity with EIA (Article 14)	40	1.4	13.2	4.5	0	5.9	11.1	0	6.3	0	25	28.6	6.6	0	0	0	8.9	
15.Access to genetic resources for equitable sharing through patent and intellectual property rights (Article 15)	20	2.8	1.3	2.3	0	0	0	0	0	0	0	0	0	0	16.7	0	2.7	
16.Exchange of technology, scientific and socio-economic research and cooperation (Article 17)	40	8.3	10.5	13.6	16.7	5.9	5.6	50	12.5	100	0	0	12.5	0	16.7	14.3	19.2	
17.Handling and distribution of Biotechnology and distribution of benefits (Article 19)	20	1.4	1.3	4.5	0	0	0	0	6.3	0	0	0	0	0	0	0	2.1	
Integration Status	49.4	23.5	15.4	16.5	16.7	15.2	15.7	21.6	15.8	41.2	23.5	16.8	19.6	13.7	17.7	13.0	20.9	
Non-integration Status	50.6	76.5	84.6	83.5	83.3	84.8	84.3	78.4	84.2	58.8	76.5	83.2	80.4	86.3	82.3	87	79.1	

Source: Researcher

Key (Policies and policy prescriptions)

1. The National Constitution of Kenya– 5 prescriptions
2. Wildlife Policy – 72 prescriptions
3. Sessional Paper No. 6 on Environment and Development – 75 prescriptions
4. Draft Environment Policy – 44 prescriptions
5. Forest Policy – 18 prescriptions
6. National Wetlands Policy – 18 prescriptions
7. Land Policy – 18 prescriptions
8. National Policy for the Sustainable Development for Northern Kenya and other Arid Lands – 6 prescriptions
9. National Oceans and Fisheries Policy - 16 prescriptions
10. Draft Fisheries Policy – 1 prescription
11. Draft Natural Resources Development and Management Policy - 4 prescriptions
12. Tourism Policy - 7 prescriptions
13. Draft ICZM Policy – 33 prescriptions
14. National Water Policy – 3 prescriptions
15. National Policy for Disaster Management – 6 prescriptions
16. National Policy on Culture and Heritage - 14 prescriptions

Annex 5B: CITES integration status for policies

CITES obligations	Policies									Average
	1	2	3	4	5	6	7	8	9	
1.Listing of endangered species in the right Annexes (Article 2)	0	11.1	33.3	0	25.0	16.7	100	0	33.3	24.4
2.Regulation of trade in endangered species (Article 3)	33.3	33.3	100	57.1	100	50	75	100	66.7	68.4
3.Granting of licenses for trading of biodiversity products (Article 6a)	33.3	16.7	0	57.1	37.5	16.7	0	0	0	17.9
4.Penalizing prohibited trade (Article 8.1)	66.7	94.4	100	16.7	37.5	16.7	100	0	0	48.0
5.Details of traded species, including the exporters and importers (Articles 8.6a & b)	0	27.8	33.3	71.4	25	33.3	50	0	0	26.8
6.Annual progress report to secretariat (Article 8.7a)	0	0	0	16.7	0	0	0	0	0	1.9
7. Biennial report to show measures of enforcement (Articles 8.7a and b)	0	0	0	0.0	0	0	0	0	0	0.0
8. Formation of a management authority to authorize trading permits (Article 9.1a)	0	11.1	0	16.7	0	0	0	0	0	3.1
9.Formation of a scientific authority to check on species numbers (Article 9.1b)	0	5.6	0	0	0	0	0	0	0.0	0.6
10. Cooperation between countries (Article 13)	33.3	38.9	0	57.1	87.5	66.7	100	100	33.3	57.4
Integration status	16.7	23.9	26.7	29.3	31.3	20.0	42.5	20.0	13.3	24.8
Non-integration status	83.3	76.1	73.3	70.7	68.7	80.0	57.5	80.0	86.7	75.2

Source: Researcher

Key (Policies and policy prescriptions)

1. The National Constitution of Kenya – 3 prescriptions
2. Wildlife Policy – 18 prescriptions
3. Sessional Paper No. 6 on Environment and Development – 3 prescriptions
4. Forest Policy – 7 prescriptions
5. National Oceans and Fisheries Policy – 8 prescriptions
6. Draft Environment Policy – 6 prescriptions
7. Draft ICZM Policy – 3 prescriptions
8. Land Policy – 1 prescription
9. Draft Fisheries Policy – 3 prescriptions

Annex 5C: CMS integration status for policies

CMS obligations	Policies								Average
	1	2	3	4	5	6	7	8	
1.Conserving migratory species by restoring and protecting habitats (Article 2.1)	100	53.7	37.5	38.1	12.5	16.7	0	19.4	34.7
2.Cooperation to support research of migratory species (Article 2.3)	100	13.0	12.5	23.8	18.8	50.0	0	27.8	30.7
3.Enduring to agreements covering conservation of migratory species (Article 5)	0	9.3	0	19.7	0	16.7	0	3.2	6.1
4.Listing of and providing immediate protection to endangered migratory species in Annex 1 (Article 3)	20.0	22.2	0	9.5	18.8	0	0	3.2	9.2
5.Designation of a national authority to implement agreements and conventions (Article 5.4c)	0	5.6	0	4.8	0	0	0	0	1.3
6.Coordination of conservation through policies and management plans (Article 5.5b)	20.0	37.0	50.0	38.1	25.0	50.0	0	20.9	30.1
7.Preventing alien species (Article 5.5e)	20.0	3.7	37.7	9.5	12.5	0	0	0	10.4
8.Provide new wildlife habitats for migratory species (Article 5.5g)	40.0	9.3	0	4.8	6.3	0	0	3.2	8.0
9.Removing threats to migratory corridors and migratory species (Articles 5.5h & i)	20.0	11.0	62.5	19.1	12.5	33.3	0	9.7	21.0
10 Public awareness and education on the contents and aims of the convention and involvement of communities (Article 5.5n)	40.0	22.2	37.5	14.3	50.0	33.3	100	15.1	39.1
Integration status	36.0	18.7	23.8	18.2	15.6	20.0	10.0	10.3	19.1
Non-integration status	64.0	81.3	76.2	81.8	84.4	80.0	90.0	89.7	80.9

Source: Researcher

Key (Policies and policy prescriptions)

1. The National Constitution of Kenya– 5 prescriptions
2. Wildlife Policy – 54 prescriptions
3. National Wetlands Policy – 8 prescriptions
4. Draft Environment Policy – 21 prescriptions
5. Sessional Paper No. 6 on Environment and Development – 16 prescriptions
6. National Oceans and Fisheries Policy – 6 prescriptions
7. Draft Natural Resources Development and Management Policy- 1 prescription
8. Draft ICZM Policy – 31 prescriptions

Annex 5D: Ramsar Convention integration status for policies

Ramsar Convention obligations	Policies					
	1	2	3	4	5	Average
1.Designation of wetlands for inclusion in the List of Wetlands of International Importance (Article 1.1)	0	3.9	0	0	0	0.8
2.Conservation, wise use and management of wetlands and migratory stocks of waterfowl (Article 1.6)	100	100	100	100	100	100
3.Formulation and implementation of plans to promote conservation and wise use of wetlands (Article 3)	60.0	26.9	29.4	47.8	50.0	42.8
4.Research, monitoring and exchange of data and training (Articles 4.3 & 4.5)	0	17.3	5.9	13.3	10.0	9.3
5.Increasing waterfowl population in wetlands without altering wetlands (Article 4.4)	0	5.8	5.9	6.7	0	3.7
6.Consultation and cooperation between countries (in case of shared wetlands), communities and other stakeholders through education and public participation (Article 5 {Amended at CoP 7 in 1999})	0	7.7	5.9	20.0	10.0	8.7
7.Representatives to CoPs to be trained experts in wetlands/waterfowl management (Article 7)	0	1.9	11.8	0	10.0	4.7
8.Parties to inform IUCN of every change in the ecological character of wetlands (Articles 3 & 8)	0	1.9	11.8	0	10.0	4.7
9.Regular reporting on conservation, management and wise use of wetlands and biodiversity (Article 6)	0	1.9	11.8	6.7	10.0	6.1
10.Establishing natural reserves on wetlands (Article 4)	20.0	1.9	11.8	0	0	6.7
Integration status	18.0	16.9	19.4	19.5	20.0	18.8
Non-integration status	82.0	83.1	80.6	81.5	80.0	81.2

Source: Researcher

Key (Policies and policy prescriptions)

1. The National Constitution of Kenya– 5 prescriptions
2. National Wetlands Policy – 52 prescriptions
3. Wildlife Policy – 17 prescriptions
4. Draft Environment Policy – 15 prescriptions
5. Sessional Paper No. 6 on Environment and Development – 10 prescriptions

Annex 5E: WHC integration status for policies

WHC obligations	Policies							
	1	2	3	4	5	6	7	Average
1. Identifying, protecting and conserving natural heritage (Article 4)	100	100	100	77.8	100	100	100	96.8
2. Adopting policies and plans aimed at natural heritage (Article 5a)	20.0	16.7	26.9	27.8	81.3	75.0	0	35.4
3. Developing scientific and technical (research) support for heritage protection (Article 5c)	0	33.3	1.9	11.1	18.2	8.3	0	10.4
4. Setting national/regional centres for training personnel in conservation/protection (Article 5e)	0	16.7	9.4	5.6	0	0	0	4.5
5. Submitting inventory of property on national heritage to WHCommittee (Article 11)	0	0	0	0	0	0	0	0
6. State to encourage formation of private foundations to collect donations for heritage conservation (Article 17)	0	16.7	5.7	5.6	0	0	0	4.0
7. Educational and awareness programmes to appreciate culture in natural heritage (Article 27)	40.0	33.3	13.2	16.7	6.3	8.3	0	16.8
8. Submission of CoP reports (Article 29)	0	0	0	0	0	0	0	0
9. Cooperation between countries and involvement of local communities (Articles 6 & 7)	0	16.7	3.8	5.6	0	0	0	3.7
Integration status	17.8	25.9	17.9	16.7	22.9	21.3	11.1	19.1
Non-integration status	82.2	74.1	82.1	83.3	77.1	78.7	88.9	80.9

Source: Researcher

Key (Policies and policy prescriptions)

1. The National Constitution of Kenya– 5 prescriptions
2. National Policy on Culture and Heritage-6 prescriptions
3. Wildlife Policy – 53 prescriptions
4. National Wetlands Policy – 14 prescriptions
5. Sessional Paper No. 6 on Environment and Development – 16 prescriptions
6. Draft Environment Policy – 12 prescriptions
7. Forest Policy – 1 prescription