# ASSESSMENT OF THE ENVIRONMENTAL IMPACTS OF WILDLIFE BASED TOURISM IN KENYA'S PROTECTED AREAS: A CASE STUDY OF MAASAI MARA NATIONAL RESERVE

**BY**

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## DECLARATION

### Declaration by the student

This research project is my original work and has not been presented for a Masters of Arts Degree in Environmental Planning and Management in any other University.

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## SUPERVISOR APPROVAL

The research work reported in this project was carried out by the candidate under my supervision.

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## DEDICATION

This project work is dedicated to my mother Marcella who encouraged and spurred my zeal for higher education.

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**ABSTRACT**

In Kenya, wildlife based tourism accounts greatly towards the growth of Gross Domestic Product. Tourism is part of a broad conceptual framework formed by a complex relationship between the nature of tourism development, the consequences of development in the destination areas, the nature of local development and the environment external to tourism development. Uncontrolled wildlife based tourism in the Maasai Mara National Reserve has posed potential threats to its natural areas. It has lead to enormous pressure on critical natural resource which has lead to impacts such as soil erosion, increased pollution, discharges into the Mara River, natural habitat loss, increased pressure on endangered species and heightened vulnerability to biodiversity. The specific objectives of the study are; to identify the benefits of wildlife based tourism in Maasai Mara National Reserve, to explore the land use land cover change of Maasai Mara National Reserve over the last four decades, to examine various negative impacts of wildlife based tourism in Maasai Mara National Reserve and to discuss the roles of different stakeholders in mitigating and controlling of impacts of wildlife based tourism in Maasai Mara National Reserve.

This study was conducted in Maasai Mara National Reserve which is located about 300 Km Northwest of the Kenyan capital, Nairobi in Narok South District, South Rift Valley, North of Tanzania. The study adopted an exploratory approach using descriptive survey design to assess the relationship between environmental impacts and wildlife based tourism activities. Both primary data using respondents' questionnaires, interview schedules, observation and photography; and secondary data using study of secondary information using document analysis and literature review were used for data acquisition. Also, both qualitative and quantitative data collection and analysis methods like descriptive of frequencies, percentages, means, and inferential statistics of regression analysis and chi-square using SPSS version 20 were used to determine the direction of the respondents' answers and association between variables. Remotely sensed data of land use/cover obtained from GLOVIS was analyzed using ArcGis 10.

The findings were presented in Graphs, tables, plates and text. Findings indicated that Wildlife Based Tourism (WBT) in Maasai Mara National Reserve (MMNR) has both benefits (including cultural interactions, employment opportunities, infrastructural development, market for local products and development of tourism facilities) and negative environmental impacts (human wildlife conflict, loss of vegetation cover, death and migration of some wildlife animals, destruction of wildlife habitat and disruption of wildlife's feeding and breeding patterns). The analysis of remotely sensed maps obtained from GLOVIS indicates a continuous decrease in vegetation cover between 1975 and 2011. The obtained land-use thematic map illustrates a decreasing forest cover and increasing grasslands and agricultural land. This reduction in vegetation cover directly affects biodiversity distribution within the Mara ecosystem which in turn affects WBT. Key stakeholders were identified as local community, the county government, hospitality facilities, tourists, tour operators and the government of Kenya through the KWS. These are the key to causes of negative impacts as they play unique roles in the MMNR. The major roles include: creating awareness, waste management, offering incentives, infrastructural developments and implementation of laws governing WBT. The study recommends increased funding for conservation purposes, regular stakeholder needs assessment and involvement in conservation programmes implementation and monitoring through policy formulation. Stakeholders' participation can also be enhanced through incentives and education campaigns.

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| | |
|---|---|
| ASAL | : Arid and Semi-Arid Land |
| EIA | : Environmental Impact Assessment |
| ETM+ | : Enhanced Thematic Mapper Plus |
| GDP | : Gross Domestic Product |
| GIS | : Geographical Information Systems |
| GoK | : Government of Kenya |
| HWC | : Human Wildlife Conflict |
| Ibid | : In the same immediately previous source (used when citing a reference) |
| KATO | : Kenya Association of Tour Operators |
| KIM | : Kenya Institute of Management |
| KIPPRA | : Kenya Institute for Public Policy Research and Analysis |
| KTB | : Kenya Tourist Board |
| KWS | : Kenya Wildlife Service |
| LULC | : Land-Use/Land Cover |
| MMNR | : Maasai Mara National Reserve |
| MSS | : Multi-Spectral Sensors |
| NCG | : Narok County Government |
| NDVI | : Normalized Difference Vegetation Index |
| SLC | : Scan Line Corrector |
| SPSS | : Statistical Package for Social Sciences |
| STD | : Sustainable Tourism Development |
| TALC | : Tourist Area Life Cycle |

| | |
|---|---|
| UN | : United Nations |
| WTO | : World Tourism Organization |
| UNEP | : United Nations Environment Programme |
| USD | : United States Dollar |
| UTM | : Universal Transverse Mercator |
| WBT | : Wildlife Based Tourism |
| WGS | : World Global System |
| WTO | : World Trade Organization |
| WTTC | : World Travel and Tourism Council |

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# CHAPTER ONE: INTRODUCTION

## 1.1 Background of the study

Tourism is the fastest growing industry in the world (Gossling, 2000). Since 1950s international tourism trips have grown every year without interruption. According to the UNWTO (2013) World Tourism Barometer, it is estimated that international tourist arrivals grew by 5% in 2013 reaching a record 1,087 million. This translates to an additional 52 million international tourists travelling the world in 2013 (UNWTO, 2013). Asia and the Pacific recorded the strongest growth with a 7% increase in arrivals, followed by Africa (+6%) and the America (+5%). Today's Travel and Tourism industry has grown into a global economic power house whose combined direct and indirect impact on the world economy according to World Travel and Tourism Council, in 2012 was USD 1.2 trillion, 260 million jobs, USD 1.2 trillion in exports. All this represented 9% of the world economy last year; one in 11 jobs globally, 5% of its economic investment and 5% of its exports (WTTC 2013). The sector has continued to provide hope for the least developed countries that lack alternative source of income (Christie and Crompton, 2010).

There is particularly great scope for development of wildlife based tourism in Africa, by virtue of the enormous diversity of habitats and wildlife species found therein. Correspondingly, tourism in general is predicted to grow considerably faster in Africa than in the rest of the world (Christie & Crompton, 2001) assuming that urgent measures will be undertaken to safeguard the integrity of the protected habitats. Comprehensive and holistic assessment on threats undermining biodiversity conservation initiatives within and outside protected areas as well as their genesis should be assessed and a workable conservation action plan targeting specifically each protected area developed and fully implemented. This means that tourism must be made sustainable, one that needs to make a positive contribution to the natural and cultural environment, generate benefits for the host communities, and not put at risk the future livelihood of local people, and

strive to anticipate and prevent economic, environmental, social and cultural degradation (Butler, 1980).

There are, however, a number of limitations to full development and benefits accruing from wildlife tourism. Limitations include the dependency of tourism on good infrastructure and political stability, the disturbance of sensitive species by tourists, and environmental impacts caused by the mass transport and development associated with high volume tourism (Morgan, 1994; Gossling, 2000). In the case of community tourism projects, benefits accruing to conservation are limited by shortages of capital and skills, low profitability, and the difficulty associated with ensuring appropriate revenue distribution (Kiss, 2004; Leader-Williams & Hutton, 2005). Several authors have identified 'narrow tourist interests' as a potentially serious additional limitation to the role of wildlife tourism in conservation. Kerley *et al*. (2003), for example, argues that tourist preferences for the 'big five' leads to an under appreciation of biodiversity. Goodwin and Leader-Williams (2000) noted that the dependence of tourism operations on the 'big five' may distort management priorities to the detriment of wider biodiversity conservation. Further, Wilkie and Carpenter (1999) assessed the potential for tourism to generate revenues for protected areas in Central Africa, and indicated that areas lacking the 'big five' have poor prospects of generating adequate revenues to cover operating costs.

Goodwin & Leader-Williams (2000), Kiss (2004) and Wilkie & Carpenter (1999) have shown that deserts, forests and mountains generally derive fewer benefits from tourism than savanna habitats, partly due to the relative difficulty of viewing large mammals in these habitats. 'Narrow tourist interests' represent a particularly severe challenge to community-based tourism as most communally owned areas are unable to match national parks in wildlife abundance or diversity, thus limiting the extent to which they can compete for the limited tourist market (Walpole & Thouless, 2005). This is particularly unfortunate as areas around national parks/reserves cannot be competitively used as communal conservation areas to help reduced land use conflicts between wildlife and humans. This further limits the extent to which the big five can be successfully conserved

outside of government protected areas thus limiting the scope for wildlife tourism to contribute to overall biodiversity conservation, particularly outside of protected areas. The areas outside of protected parks are therefore continually under pressure of conversion to agriculture which in a short term appears a more promising source of livelihood to the indigenous communities.

The key foundation for wildlife tourism is conservation of the wildlife without which tourism is simply short-term mining of the resource and has no role in a modern sustainable society. In wealthy countries there are often high-yielding alternative uses for the habitat. In all countries there are many stakeholders in wildlife tourism and ensuring the development of sustainable tourism is a difficult task. While Governments have special, often central, roles in ensuring proper legislative protection and resources for conservation, other partners are also crucial- habitat managers (protected area managers, private landowners, conservation NGOs, and traditional owners) have high responsibility for the day to day conservation outcomes.

The natures of tourist activities in destination areas make it have environmental impacts, an aspect that this study aims at addressing. Because of its rich wildlife diversity and scenic beauty, Maasai Mara has in the past two decades attracted tourists from various continents such as those of North America, Europe, Australia, New Zealand, Asia, India and Africa. The growth of tourism in Maasai Mara has also resulted in the establishment of tourist facilities in the area which includes safari drive, game viewing, walking trails, balloon safaris and several other photographic tourist activities. These activities have increased over the years and are likely to have a negative effect on the natural resources upon which it depends. Clear evidence on declining natural resources for the MMNR is scanty. As a consequence short-term impacts are poorly understood while long-term impacts virtually unstudied. This research will provide valuable data upon which more detailed research and eventually natural resource modeling will be based. It will also inform policy formulation for the conservation of the environment. The need for conservation in Kenya is again necessary because, tourism industry employs thousands of people with a considerable potential to diversify to provide a strong base upon which

tourist numbers and revenue can be increased and threats to the existence of tourism managed. As such, there is a need to accord attention to the sector through proper management of protected areas and promotion of diverse tourist attraction products within the country especially culture, agro-tourism, sports tourism and rural based tourism so as to divert pressure from wildlife based tourism in protected areas (Christie and Crompton, 2010).

### 1.2 Statement of the research problem

Sharpley and Telfer (2002) stated that tourism is part of a broad conceptual framework formed by a complex relationship between the 'nature of tourism development, the consequences of development in destination areas, the nature of local development and the environment external to the tourism system'. Indeed in Kenya's protected areas are the prime motivation of 70-80% of all tourists visiting the country, vegetation has been degraded, wildlife behavior disrupted, pollution increased, and resources generally have been overutilized (Ikiara and Okech, 2002). International Development Research Center (IDRC, (2009)) examined tourism's impact on biodiversity in Kenya's wildlife. They concluded that tourism could become a victim of its own success of attracting tourists. The disruptive human presence in parks could reduce the number of wildlife, which could in turn cause a drop in the number of tourists.

Uncontrolled wildlife based tourism in the reserve has posed potential threats to its natural areas. It has led to enormous pressure on critical natural resource which has led to impacts such as soil erosion, increased pollution, discharges into the Mara River, natural habitat loss, increased pressure on endangered species and heightened vulnerability to forest fires. Therefore, the success of wildlife based tourism in Masaai Mara National Reserve requires sound environmental management plan, controlled development, tourist flow, and inclusion of key stakeholders based on analysis of the environmental resources of the reserve. This information is currently lacking in mitigating and controlling the impacts of wildlife based tourism on the environment. This study therefore, assessed the environmental impacts of wildlife based tourism in Maasai Mara national reserve; which have been affecting this reserve over the past four decades.

## 1.3 Research Questions

(i) What benefits that accrues from wildlife based tourism in Maasai Mara National Reserve?

(ii) What are the negative environmental impacts associated with wildlife based tourism in Maasai Mara National Reserve?

(iii) Are the status changes in Maasai Mara National Reserve over the last four decades caused by wildlife based tourism?

(iv) Do stakeholders have any role in mitigating and controlling wildlife based tourism impacts in Maasai Mara National Reserve?

## 1.4 Purpose of study

The purpose of the research is to assess environmental impacts of wildlife based tourism within Maasai Mara national reserve that could prompt the sustainable tourism.

### 1.4.1 Specific Objectives of the study

(i) To examine the benefits of wildlife based tourism in Masaai Mara National Reserve.

(ii) To evaluate negative environmental impacts of wildlife based tourism in Maasai Mara National Reserve.

(iii) To explore the land use land cover changes of Masaai Mara National Reserve over the last four decades

(iv) To determine the roles of different stakeholders in the mitigation and control of impacts of wildlife based tourism ‘’4in Maasai Mara National Reserve.

## 1.5 Hypotheses

(i) Wildlife based tourism in Masaai Mara National Reserve has both benefits and negative environmental impacts.

(ii) There has been an environmental status change in Maasai Mara over the last four decades.

(iii) Different stakeholders play unique roles towards the mitigation and control of impacts of wildlife based tourism in Maasai Mara National Reserve.

**1.6 Justification of the study**

Demand for wildlife-based tourism and recreation has increased during later years (Hall, Muller & Saarinen, 2009). Although the development of wildlife based tourism is encouraged by regional policy and development programmes, the potential of wildlife based tourism for regional development and rural entrepreneurship is contested because of lack of evidence in many contexts (Hall & Boyd, 2005; Muller & Jansson, 2007). It is now widely recognized that tourism as an alternative form of development has unique impacts on the environment (Higginbottom, Tribe & Booth, 2003). Overexploitation and degradation of resources cause great harm to the environment. The desire of tourists to have a closer view of wildlife has increased mobility into national parks, including off-road driving, which has led to substantial loss of natural vegetation. In some instances, tourism harasses animals in protected areas (Ikiara and Okech, 2002).

The tourism development moratorium that NEMA had recommended is yet to be implemented in the reserve.

There exists a widespread perception of tourism as a development tool in the developing world. Thus, many people see tourism as a means of contributing to the achievement of Millennium Development Goals (MDGs). While this remains a credible assumption, current literature offers a rather limited set of empirical studies to support it (Noveli and Hellwig, 2010). This project contributes to this body of knowledge by focusing on an assessment of impacts of wildlife based tourism in Maasai Mara as a case study.

Maasai Mara is one of the greatest national reserves in Kenya which needs to be protected from adverse environmental impacts. It is currently under great pressure and susceptible to degradation from the increase of wildlife based tourism. There has been a

decrease in acreage of the reserve area from 1821 $km^2$ (703 sq miles) in 1961 to the current 1510 $km^2$ (580sq miles).

### 1.7 Scope and limitations of the study

This study is based on the tourism industry in particular wildlife based tourism in Maasai Mara National Reserve. This study assesses the environmental impacts of wildlife based tourism on the environment in Kenya's protected areas: A case study of Maasai Mara National Reserve. The study assessed seven major variables. These variables were: benefits of WBT, status change of the MMNR, negative impacts of WBT, roles of different stakeholders, mitigation and control of the negative impacts of WBT, challenges of WBT and opportunities available in WBT in MMNR.

The secondary data used were those of the past years while GIS data was analysed to show land cover land use changes over the years. The study respondents were hoteliers, tour operators, Narok County Council (NCC) and the local community. The research used both descriptive and statistical data analysis methods.

However, the study was carried out in the newly created Narok South District side of the MMNR hence findings generalization will be limited to Protected areas. The study also focused on WBT a subset of nature tourism especially the fauna section of nature. Comprehensive response from NCC was not well covered since most of the staffs were not present in their offices due to the industrial strike they had. Images of MMNR from 1974-1984 were not sent from the source. So the study didn't discuss much about the ecological changes of the reserve within those years.

## 1.8 Definition of Operational terms

**Environmental Impact Assessment:** Part of impact assessment that identifies and predicts the impacts from development proposals on both the biophysical environment and on human health and well – being

**Geographical Information Systems:** This refers to the collection, analysis, storage and display of data which are spatially referenced to the surface of the Earth

**Nature Based Tourism:** This involves experiencing natural places typically through outdoor activities that are sustainable in terms of their impacts on the natural environment. This activities range from active to passive and includes everything from bush walking and adventure tourism experiences to sight-seeing, scenic driving and wildlife viewing (Higginbottom, 2004).

**Protected Area:** This is an area of land or sea especially dedicated to the protection and maintenance of biological diversity and natural resources and managed through legal and other effective means

**Stakeholders**: Refer to people, institutions, or social groups that are involved in, or affected by, decision making regarding biodiversity conservation issues

**Sustainable Tourism Development:** These are forms of tourism economic growth and activities that do not deplete or degrade natural resources upon which it depends. It involves strategic long- term thinking and planning and also considers the interests of all stakeholders including indigenous peoples and local communities

**Wildlife Based Tourism:** is a subset of nature based tourism and one in which significantly high levels of Domestic and International interest exist (Higginbottom, 2004).

# CHAPTER TWO: LITERATURE REVIEW

## 2.1 Introduction

This section contains a reviewed literature on wildlife based tourism and its relation on the environment. Tourism activity has grown rapidly since the Second World War due to advances in technology and increase in standards of living enjoyed across the world (Huybers and Bennett, 2003). Wildlife based tourism is a particularly fast growing type of tourism (World Travel and Tourism Council 2013).

### 2.1.2 The concept of Wildlife Based Tourism

Wildlife tourism is a form of nature-based tourism that is centered on the interaction of tourists with wild animals (Reynolds & Braithwaite, 2001). Such interactions can play different roles in the tourist experience: from a marginal role, for example in the case where wildlife is an incidental part of a guided tour, to a central role, as in recreational hunting and fishing tours (Reynolds & Braithwaite, 2001). From a historical point of view, wildlife tourism is not a new phenomenon. African wildlife safaris were relatively common among explorers of the 19th century, and travels with the intention of observing specific species in their natural habitat date back to the late 1960s (Wilson & Tisdell, 2001). The latter form of wildlife tourism has gained popularity especially from the 1980s, and it is sometimes categorized as a form of ecotourism (Tisdell & Wilson, 2002). Over the past century, African nations have established an extensive network of protected areas, which play an essential and central role in conserving species and ecosystems. There are more than 1100 national parks and related reserves in sub-Saharan Africa, of which 36 are, designated World Heritage Sites (Newmark, 2008). Since 1970, total protected-area coverage in Africa has increased nearly two-fold, and now encompasses 3.06 million km2 of terrestrial and marine habitats (ibid). Protected areas currently cover 15.9% and 10.1% of total land surface in the East/Southern African and West/Central African regions, respectively (Chape *et al*. 2005). While the expansion of protected area coverage in Africa over the past 30 years is extremely encouraging, the capacity of selected reserves to maintain viable populations of many wildlife species over the long

term is threatened by a combination of human-influenced activities within and outside reserves, yet are poorly understood (Newmark, 2008).

### 2.1.3 Global perspective

Nature-based tourism is frequently described as one of the fastest growing sectors of the world's largest industry, and a very important justification for conservation. However, a recent, high profile report has documented declining visit rates to US and Japanese national parks as evidence of a pervasive shift away from nature tourism. Balmford *et al*., (2009) used the largest database so far compiled on trends in visits to Protected Areas around the world to resolve this apparent paradox. He found that, while visit rates—measured in two different ways—are indeed declining in some wealthy countries, in roughly three-quarters of the nations where data are available, visits to Protected Areas are increasing. Internationally, rates of growth in the number of visits to such areas show a clear negative association with per capita income, which interestingly is matched by trends in foreign arrivals as a whole. This findings show that despite worrying local downturns, nature-related tourism is far from declining everywhere, and may still have considerable potential to generate funds for conservation and engage people with the environment (ibid).

## 2.2 Development of wildlife based tourism in Kenya

Tourism in Kenya developed before 1930 when international tourists began arriving in the country in small numbers. Most of these early overseas visitors to the country were wealthy Europeans and Americans who could afford the time and resources for leisure recreation (Irandu, 2004). The rich wildlife resource was the base on which Kenya's tourism industry was founded. Today, protected areas cover about 8 percent of the country's total land. The first tourists to visit the parks in the 1950s and 1960s were interested in sport hunting, sport fishing, collection of trophies, and generally viewing wildlife. Some of the major activities included slaughtering game for food, skin, ivory, capturing live animals for sale abroad, and photography (Ibid). By the 1970s, sport hunting had combined with poaching and subsistence hunting to threaten certain species

of wildlife. This led to the banning of sport hunting and trade in game trophies in 1977 and 1978 respectively.

Following the official banning of hunting, Kenya's tourism began to be promoted in terms of shooting wildlife with the camera, and greater emphasis went into the promotion of natural landscapes in the country including biodiversity, wildlife, unique eco-systems, beautiful scenery including the Rift Valley, volcanic mountains and sandy beaches (Irandu, 2004). In addition, the country developed ornithological trips and botanical study tours and other such specialized tours. Within five years of the banning of sport hunting, the country was transformed into an important ecotourism destination (Irandu, 2004, Odunga & Maingi 2011). Throughout the 1980s and early 1990s, the number of international tourists visiting Kenya, mainly to view wildlife, increased dramatically (Irandu 2004). However; unregulated tourism was damaging some wildlife habitats and disturbing wildlife species, especially in Maasai Mara Game Reserve and Amboseli National Park. The government of Kenya was becoming increasingly concerned about the future of tourism and the rich natural heritage. The wildlife conservation and management department, which had been formed as a merger between the game department and the Kenya National Parks, was replaced by the Kenya Wildlife Service (KWS) in 1990 (Irandu, 2004).

Thus wildlife based tourism is at the heart of tourism in Kenya. Currently Kenya has approximately 52 (appendix VI) wildlife based tourism protected areas covering approximately 8% of the country. Also there are 17 sanctuaries and they are expected to increase (Irandu 2004; Odunga and Maingi, 2011). However, such noble realization has come up with its own environmental complications due to poor strategies in place to control this. This study provides a differentiated assessment of the environmental impacts of Wildlife Based Tourism in Kenya's protected areas a case study of Maasai Mara National Reserve. The Conservational use of the animals and plants in Masaai Mara National Reserve is an important reason why the number of tourism activities should be kept to a sustainable level so as to avoid any further environmental degradation. Such information lacks in public domain for wildlife tourism in Kenya.

Kenya features some of the most famous big game safari destinations in the world, paralleled perhaps only by Tanzania. According to KTB (Kenya Tourism Board) the number of international arrivals to Kenya in the year 2012/2013 was 1.1 million tourists as at 31st December, 2013. This was a 8.8% decline compared to the 1.2 million experienced in 2011/2012 (KTB, 2013). The Maasai Mara National Reserve is not a national park; it is formally owned by the authorities of Narok and the Transmara, respectively. Conservation efforts in the area have been mixed. From the time of heavy hunting in the 1960s, most of the fauna has recovered. The majority of the population in the area is Maasai, and this of course also mirrors the political representation in the regional councils. The area around the National Reserve is mainly privately owned land, predominantly family or community owned ranches where the Maasai live and herd their livestock. Global tourism is an important source of income in the area. Revenues come in several different ways. One source is entrance fees for the National Reserve. Other sources of income from tourism in the area are land-lease for tourist camps, lease of temporary campsites and employment as guides, drivers and other personnel in the tourism sector. Others sell agricultural products and food to the camps and restaurants. All this clearly links the Mara area to global tourism commodity chains, which to a considerable degree has shaped development in the area. Uddhammar and Shechambo (2004), notes that several collective action problems, which each may affect the environment negatively in the long run, are present in the Maasai Mara. The most obvious is the non-existence of regulations for driving. You can drive off road anywhere, which has resulted in a wide network of dirt tracks.

### 2.3 Economic Impacts of Tourism

Tourism in and around the natural reserves is supposed to generate money and work for the local population, which eventually will make them aware of the economic value of wildlife and conservation (Eagles *et al*., 2002; Uddhammar, 2006). The entrepreneurs engaged in the camps and in the safari business are often partly idealists, partly businessmen. The typical eco-traveler to East Africa may today come from any social class in an industrialized country, but will be treated with the same blend of aristocratic

exclusivity, ecological enlightenment and rugged experiences on the field. The traveler's interest in experiencing wildlife in this way involves a powerful series of economic and ecological incentives (Uddhammar, 2006).

Tourism's economic significance gives the industry greater respect among the business community, public officials, and the public in general; the tourism economy contributes to national income, attracts foreign exchange, receives more tourists, and provides a chance to make known the nation's heritage and culture too (Uddhammar, 2006). Research has shown that the economic impact of tourism does not only depend on how many tourists are received (Pouta, Neuvonen & Sievanen, 2006; Mehmetoglu, 2007). There are several other factors that are important for the benefits of tourism on the local community. These can be grouped into factors related to the tourists and their demand and to the destinations and their supply, respectively (Pouta *et al.,* 2006). Destinations focusing on nature-based tourism are often in relative remote locations in relation to the urban demand markets (Hall & Boyd, 2005; Hall, 2007). Nevertheless, the supply of nature-based tourism products is not necessarily evenly spread out over the area. Moreover, varying accessibility and relative location towards the urban demand markets give advantages to certain destinations and disadvantages to others (Hall, 2007). Additionally local variations in population and other socioeconomic preconditions influence the local tourism supply (Muller & Jansson, 2007). This means that demand is not evenly distributed in relation to type and spatial structure of supply.

The earning from tourism have made it one of the world's largest industries and the fast growing sectors of global trade, accounting for 9.5 per cent of Global Gross Domestic Product, 5.4 per cent of global exports, 1.8 per cent increase of global employment (or one in every 11 jobs globally) and 4.4 per cent of global capital investment (WTTC, 2013). International tourists' arrivals worldwide reached 1087 million in 2013 from 1035 million in 2012 an increase of 5%, generating US$ 1.4 trillion revenues (UNWTO, 2013). International tourism flows are expected to reach 1.5 billion by 2020 and revenue estimated to cross $ 2000 billion mark (Ibid).

One of the possible benefits of the development of wildlife based tourism is that the economic returns from engaging in it can exceed the costs involved. This is only possible, however, for a wildlife site if exclusion from the site is easy and not too costly. In such a case, wildlife used for tourism can be directly marketed, and such marketing could be (but need not be) profitable. The level of profitability will depend to some extent on how well the environment is managed and the nature of the development.

**2.4 Environmental Impacts of Tourism**

Tourism and environmental protection are the two sides of the same coin. Tourism creates pressures on different domains—natural resources and environment, the built environment, and cultural resources (Natrona *et al*, 2002). Eagles *et al.,* (2002) opined that the "protected areas need tourism", and "tourism needs protected areas". Thus, tourism is considered as a critical component in establishment and management of protected areas. The impacts of tourism on the environment can be realized on water (surface and ground water), energy (fossil fuels), air (atmospheric pollution), wildlife (extinction of species), ecosystems (flora and fauna), aesthetic (fading) and culture (invasion), gateway community (habits), land base pollution (solid waste) and sound pollution (transport); historical and cultural sites (warp), distortion of traditional settlements (invasion of outsiders); loss of natural capital and scenic beauty of landscapes, morphological and topology of sites and on the social environment (Kumar and Ramaswamy, 2005). The magnitude of these impacts depends on the intensity of tourism development and use, resilience of the ecosystem, long-term versus short-term tourism planning and the extent of modification of the tourism site (Ikiara and Okech, 2002).

Kerley *et al.* (2003), found out that tourist preferences for mega-fauna lead to an under appreciation of biodiversity. Goodwin and Leader-Williams (2000) suggest that the dependence of tourism operations on mega-fauna may distort management priorities to the detriment of wider biodiversity conservation.

Partly due to increasing degradation and reduction of the quality of Kenya's tourism product, the country is experiencing severe problems of competition as more tourists are switching to countries in the region which offer similar tourist attractions. These include countries such as South Africa, Zimbabwe, Botswana, Swaziland, Rwanda, Burundi, Tanzania and Uganda. Consequently, the number of international visitor arrivals in Kenya has been declining in recent years.

**2.5 Uncoordinated mass tourism**

Tourism development has not progressed without controversy. Mass tourism has become more popular among the tourists because of easy accessibility with their own groups, packaged holiday tours, gaining interest in low cost tourism, higher-quality tourism with experienced guides, and showing interest in seeing and watching natural and cultural sites. For many people today, nature, beauty, and calm are the first criteria for choosing a tourism destination (UNEP, 2005). Disillusionment with mass tourism and the many problems it has triggered in protected areas has led to many observers and researchers to criticize vociferously the past methods and directions of tourism development and to offer instead the hope of alternative tourism developmen (Eagles *et al.,* 2002). Such reactions have been more notable for their harsh judgment against mass tourism than their positive contributions.

Success in attracting tourists and tourism related investment has sometimes led to over exploitation of tourism resources, which has deteriorated the tourism experience for visitors and hosts alike. The laissez fair tourism policy has led to the development of tourism and hospitality facilities with little consideration of the long-term socio-economical and long-term impacts of the facilities. In consequence unplanned and haphazard development of tourism and hospitality facilities in fragile protected areas has, for instance caused accelerated and severe problems of tourism resource degradation, and reduction of the quality of the tourism product. For example, hotels and lodges have been constructed that interfere with fragile arid and semi-arid ecosystem without taking into consideration the environmental impacts such as ecological needs and aesthetic values of the tourism facilities (Irandu, 2006). Davenport and Switalski (2005) points out that the

greatest ecological threats that mass tourism poses undoubtedly lie in the infrastructure and transport arrangements required to support it, particularly in situations where numbers of tourists are subject to little control.

### 2.6 Effects of wildlife based tourism on culture

Tourism is much more than a mere economic activity; it is a complex and dynamic phenomenon, present in virtually every corner of the world and affecting people in multiple ways (Brennan & Luloff, 2010). The socio-cultural effects of tourism, especially in developing countries, are probably the most worrying aspect of a global (ized) sector that offers cut-price packages to remote and exotic destinations. Tourism affects the way cultural practices and landscapes are shaped, and cultural change reflects the influence of tourism as one of the agents in place transformation. Success stories in tourism might not be so hard to find. However, in light of sustainable development, success should never be conceived of as a static result. The fact that external as well as internal factors can disrupt even the strongest and most successful tourism projects should make us cautious (Brennan & Luloff, 2010). Tourism destroys or preserves the beauty of a culture and it trivializes or revalidates culture. Irandu, 2004 argues that the impact of international tourism on cultural heritage of a given community, region or country may be great given that in tourism, unlike in other sectors of the economy, the customer is brought to the product instead of the other way round. Tourism may provide a monetary incentive to revive art forms, crafts and other cultural attributes of a given local community.

### 2.7 Theoretical Framework

Nature-based tourism and wildlife tourism are becoming increasingly popular worldwide and are often promoted as a means of protecting and preserving environmental resources (Hughes, 2012). On the theoretical side, discussion has covered several issues, including the integration of conservation and development (Meguro and Inoue, 2011), the gap between outsiders' intentions and local interpretations of "conservation" (Goldman, 2003), and the social meaning of customary resource uses overlooked by outsiders (Iwai, 2009). Buckley, 2009 found out that rigorous evaluation of environmental outcomes from

commercial tourism products generally requires on-site audit and assessment with full access, internal and external documentary sources, and interviews with staff and third-party stakeholders and even then there is no guarantee that the auditor or the assessor has uncovered everything relevant. A number of theoretical applications have been highlighted in effort to explain the environmental impacts of wildlife based tourism. These include; life cycle theory, stakeholders' theory and resource dependence theory.

### 2.7.1 Stakeholder Theory

Pioneered by Freeman in 1984, this theory suggests that a phenomenon is characterized by its relationships with various groups and individuals, who can affect or who are affected by its activities. A legitimate stakeholder is one who has the right and capacity to participate in the process; a stakeholder who is impacted by the decisions of other stakeholders has a right to become involved in order to moderate those impacts, but also must have the resources and skills (capacity) in order to participate (Easterling, 2004). As key stakeholders in a tourism system, residents' needs must be identified, considered and subsequently, satisfied. As Bryson *et al*. (2002) stated, "Key stakeholders must be satisfied at least minimally, otherwise policies, organizations, communities and even countries will fail." Similarly, Buer (2002) stated that return on investment (ROI) within a tourism system is a function of stakeholder satisfaction. For Buer, it is the stakeholder focus that is the strategic imperative, as opposed to a competitive or customer focus. Therefore, successful strategies are those that integrate the interests of all stakeholders, rather than maximize the position of one group within limitations provided by the others. In order for this balance to be achieved and therefore, sustainable tourism development to be successful a range of stakeholders (Freeman, 1984; Friedman & Miles, 2002; Phillips & Freeman, 2003) must be involved in the process. However, stakeholders are people and as such hold values (Rokeach, 1973) which drive their behavior as both individuals and organizations adhere to values. Values or sets of values vary across groups and cultures as well as across individuals (Hogg & Vaughan, 2002).

### 2.7.2 Resource Dependence Theory

In this theory by Pfeffer and Salancik, an organization is conceptualized as being dependent on resources in its environment for its survival (Pfeffer & Salancik, 1978). Pfeffer & Salancik, (1978) notes that, there are three factors that is critical in determining the dependence of one organisation on another. First, there is the importance of the resource, the extent to which the organization requires it for continued operation and survival. The second is the extent to which the interest group has discretion over the resource allocation and use. And, third, the extent to which there are few alternatives, or the extent of control over the resource by the interest group. Organisations which require one primary input for their operations will be more dependent on the sources of supply for that input than organizations that use multiple inputs, each in relatively small proportion. An organisation that creates only one product or service is more dependent on it than an organization that has a variety of outputs that are being disposed of in a variety of markets. The criticality of a resource in the functioning of an organisation is more difficult to determine than the sheer magnitude of its use. Criticality measures the ability of the organisation to continue functioning in the absence of the resource or in the absence of the market for the output.

Achieving stability in the supply of a resource or in the absorption of an output is problematic for an organisation that requires steady resource exchanges to operate. Instability may change a situation of adequate supply to one of insufficiency. Uncertainty or instability with respect to an important resource threatens the continued existence of the organisation, because it makes the participation of coalition members more doubtful. If participants have come to rely on an organisation for performances or resources and these become unpredictable, the benefits of participation in the coalition diminish, and it is in the interests of all participants either to abandon the unstable organisation for a more stable coalition or to stabilize the uncertainty confronting the organisation.

Because of resource dependencies, managers do not have unbridled strategic choice, as Andrews (1971) and Child (1972) originally proposed, but must make strategic choices within constraints (Pfeffer & Salancik, 1978). These strategic choices will be aimed, at

least in part, at managing external dependencies both to guarantee the survival of the organization and to secure, if possible, more independence and freedom from external constraints (Pfeffer, 1982:). An organization could manage these external dependencies by adapting to its environment, by altering constraints through interlocking directorships and joint ventures, or by changing the legality of its environment through the use of political action (Pfeffer & Salancik, 1978).

### 2.7.3 Tourist Area Life Cycle of Evolution.

Lifecycle Theory parallels product life cycle theory, suggesting that tourism develops through distinct stages over time. Butler (1980) identified these stages as: exploration, involvement, development, consolidation, and stagnation, and said that they could be followed by subsequent strategic choices ranging from rejuvenation to decline. Hovinen's (2001) study of a mature tourist destination provided further support for the theory's efficacy. The **exploration stage** is characterized by a small numbers of tourists of irregular visitations. At this time there would be no specific facilities provided for visitors. The use of local facilities and contact with local residents are therefore likely to be high, which may itself be a significant attraction to some visitors. The physical fabric and social milieu of the area would be unchanged by tourism, and the arrival and departure of tourists would be of relatively little significance to the economic and social life of the permanent residents.

As number of visitors increase and assume some regularity, some local residents will enter the **involvement stage** and begin to provide facilities primarily or exclusively for visitors. Contact between visitors and locals can be expected to remain high and, in fact, increase for those locals involved in catering for visitors. As this stage progresses, some advertising specifically to attract tourists can be anticipated, and a basic initial market area for visitors can be defined. A tourist season can be expected to emerge and adjustments will be made in the social pattern of at least those local residents involved in tourism. Some level of organization in tourist travel arrangements can be expected and the first pressure put upon governments and public agencies to provide or improve transport and other facilities for visitors.

The **development stage** reflects a well-defined tourist market area, shaped in part by heavy advertising in tourist-generating areas. As this stage progresses, local involvement and control of development will decline rapidly. Some locally provided facilities will have disappeared, being superseded by larger, more elaborate, and more up-to-date facilities provided by external organizations, particularly for visitor accommodation. Natural and cultural attractions will be developed and marketed specifically, and these original attractions will be supplemented by man-made imported facilities. Changes in the physical appearance of the area will be noticeable, and it can be expected that not all of them will be welcomed or approved by all of the local population. Regional and national involvement in the planning and provision of facilities will almost certainly be necessary and, again, may not be completely in keeping with local preferences. The number of tourists at peak periods will probably equal or exceed the permanent local population. As this stage unfolds, imported labour will be utilized and auxiliary facilities for the tourist industry (such as laundries) will make their appearance.

As the **consolidation stage** is entered the rate of increase in numbers of visitors will decline, although total numbers will still increase, and total visitor numbers exceed the number of permanent residents. A major part of the area's economy will be tied to tourism. Marketing and advertising will be wide-reaching and efforts made to extend the visitor season and market area. Major franchises and chains in the tourist industry will be represented but few, if any, additions will be made. The large numbers of visitors and the facilities provided for them can be expected to arouse some opposition and discontent among permanent residents, particularly those not involved in the tourist industry in any way, and to result in some deprivation and restrictions upon their activities.

As the area enters the **stagnation stage** the peak numbers of visitors will have been reached. Capacity levels for many variables will have been reached or exceeded, with attendant environmental, social, and economic problems. The area will have a well-established image but it will no longer be in' fashion. There will be a heavy reliance on repeat visitation and on conventions and similar forms of traffic. Surplus bed capacity will be available and strenuous efforts will be needed to maintain the level of visitation.

Natural and genuine cultural attractions will probably have been superseded by imported 'artificial' facilities. The resort image becomes divorced from its geographic environment. New development will be peripheral to the original tourist area and the existing properties are likely to experience frequent changes in ownership.

In the **decline stage** the area will not be able to compete with newer attractions and so will face a declining market, both spatially and numerically. It will no longer appeal to vacationers but will be used increasingly for weekend or day trips, if it is accessible to large numbers of people. Property turnover will be high and tourist facilities often replaced by non-tourist related structures, as the area moves out of tourism. This latter factor, of course, is cumulative. More tourist facilities disappear as the area becomes less attractive to tourists and the viability of other tourist facilities becomes more questionable. Local involvement in tourism is likely to increase at this stage, as employees and other residents are able to purchase facilities at significantly lower prices as the market declines. The conversion of many facilities to related activities is likely. Hotels may become condominiums, convalescent or retirement homes, or conventional apartments, since the attractions of many tourist areas make them equally attractive for permanent settlement, particularly for the elderly. Ultimately, the area may become a veritable tourist slum or lose its tourist function completely.

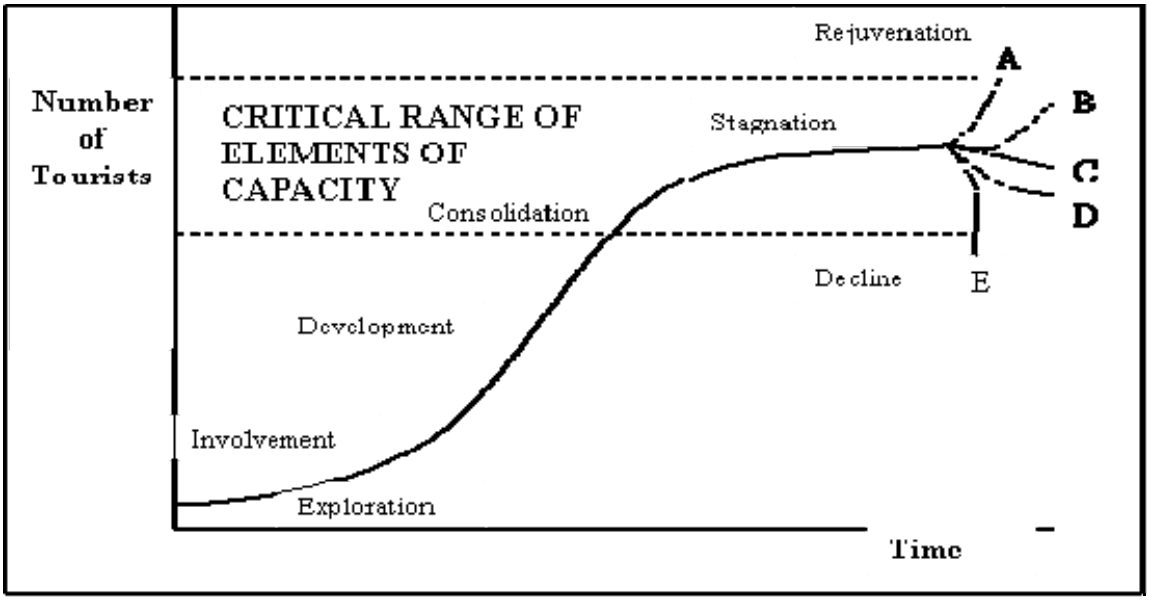
On the other hand **rejuvenation** may occur, although it is almost certain that this stage will never be reached without a complete change in the attractions on which tourism is based. Two ways of accomplishing this goal can be seen at present. One is the addition of a man-made attraction, as in the case of Atlantic City's gambling casinos. Obviously, though, if neighbouring and competing areas follow suit, the effectiveness of the measure will be reduced; a major part of Atlantic City's anticipated success is the element of uniqueness which it has obtained by the change. An alternative approach to rejuvenation is to take advantage of previously untapped natural resources. Spa towns in Europe and the summer holiday village of Aviemore in Scotland have experienced rejuvenation by a reorientation to the winter sports market, thus allowing the areas to experience a year-round tourist industry. The development of new facilities becomes economically feasible,

and simultaneously serves to revitalize the older summer holiday trade. As new forms of recreation appear, it is not impossible that other tourist areas will find previously unappreciated natural resources to develop.

The direction of the curve after the period of stabilization illustrated in Figure 2.1 is open to several interpretations. Successful redevelopment, as for example in Atlantic City, could result in renewed growth and expansion as shown by curve **A.** Minor modification and adjustment to capacity levels, and continued protection of resources, could allow continued growth at a much reduced rate (curve **B).** A readjustment to meet all capacity levels would enable a more stable level of visitation to be maintained after an initial readjustment downwards (curve **C**). Continued overuse of resources, non-replacement of aging plant, and decreasing competitiveness with other areas would result in the marked decline (curve **D).** Finally, the intervention of war, disease, or other catastrophic events would result in an immediate decline in numbers of visitors (for example, Northern Ireland from **1969),** from which it may be extremely difficult to return to high levels of visitation. If the decline continues for a long time, the area and its facilities may no longer be attractive to the majority of tourists after the problem i**s** solved (curve **E**).

This study borrows much of the ideas expressed by Butler's TALC Model (Tourist Area Life Cycle) as shown in figure 2.1. However some connotations of both Freeman's and Pfeffer and Salacik's' ideas may be scarcely spread in the work.

**Figure 2.1: Tourist Area Life Cycle**




Source: Butler 1980

## 2.8 Conceptual model

Wildlife Based Tourism in Protected Areas has both benefits and negative environmental impacts which goes straight to affect stakeholders who depend on it. This means the stakeholders need to come together and conduct environmental status analysis which calls for mitigation and control measures or environmental planning and management as tools of operation. These tools can be used independently, interchangeably or together in determining the environmental status.

On the other hand, mitigation and control measures can be used to solve negative WBT impacts. Consequently, mitigation and control measures together with environmental planning and management will result to sustainable WBT. This will see the destination (MMNR) to achieve its long-term positive impacts that will be beneficial to all stakeholders involved (figure 2.2).

**Figure 2.2: Conceptual model for sustainable wildlife based tourism in protected areas**

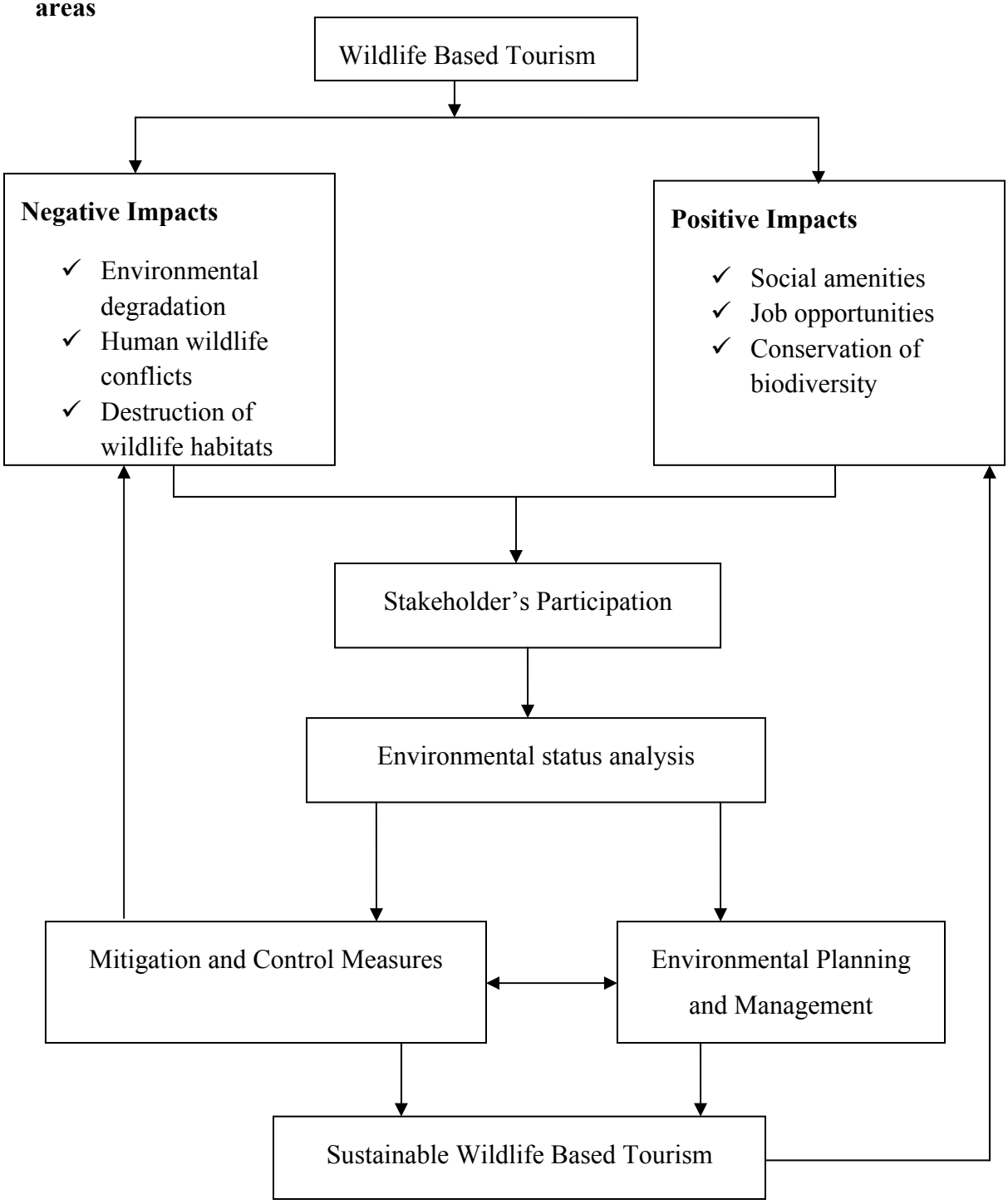



Figure 2.1: Hypothesized Conceptual framework

Source: Author, 2012

## 2.9 Research gaps identified

Kenya's initiative to designate rich biota landscapes exclusively for nature preservation (Mugabe *et al*., 1998; Mugabe, 1998; Kameri, 2002) has been lauded. Further, since Kenya's national economy is predominantly hinged on biological resources, wildlife protected areas are an important asset from which a significant amount of foreign exchange has been derived in the past few decades (Okello *et al*., 2001). Irandu (2004), in his study noted that a large proportion of tourist come to Kenya, and particularly Maasai Mara, he however laments that unregulated tourism is damaging some wildlife habitats and disturbing wildlife species, especially in Maasai Mara Game Reserve and Amboseli National Park. Kumar and Ramaswamy (2005) have also noted negative environment effects as a result of tourism activities. The magnitude of these impacts depends on the intensity of tourism development and use, resilience of the ecosystem, long-term versus short-term tourism planning and the extent of modification of the tourism site (Ikiara and Okech, 2002).

The animal migrations between MMNR and Serengeti show that the protected areas within the ecosystem are not adequate for their needs. The movements into human settlements shows that what happens in the adjoining group ranches have a direct influence on wildlife in the protected areas.

Although a few studies pertaining to negative effects of WBT have been conducted in Maasai Mara (Omondi, 1995; Rogerson, 1996; Amting, 1997; Bruner, 2001; Seno& Shaw, 2002; Duerksen &Snyder, (2005; Kamusoko & Aniya, 2007), very little has been done to analyze land use/cover changes and it's association with tourism development in and around the Maasai Mara reserve. In addition, most of these studies (Omondi, 1995; Rogerson, 1996; Seno& Shaw, 2002), have concentrated on qualitative data and approaches to data acquisition without considering the driving forces and thus do not provide sufficient insights into the spatial temporal dynamics of these changes. Therefore, a comprehensive analysis of land use/cover changes and wildlife stakeholder dynamics and roles (Ostrom, 1990; Hartup, 1994; Jackson, Hillard & Wangchuk, 2001; Bille & Mermet, 2002; Doolittle, 2003; Heberlein, 2004;) that are also considered the

primary driving forces behind these changes is needed in order to help in formulation of a sustainable development policy for the ecosystem.

## CHAPTER THREE: METHODOLOGY

### 3.1 The study area

#### 3.1.1 The study area.

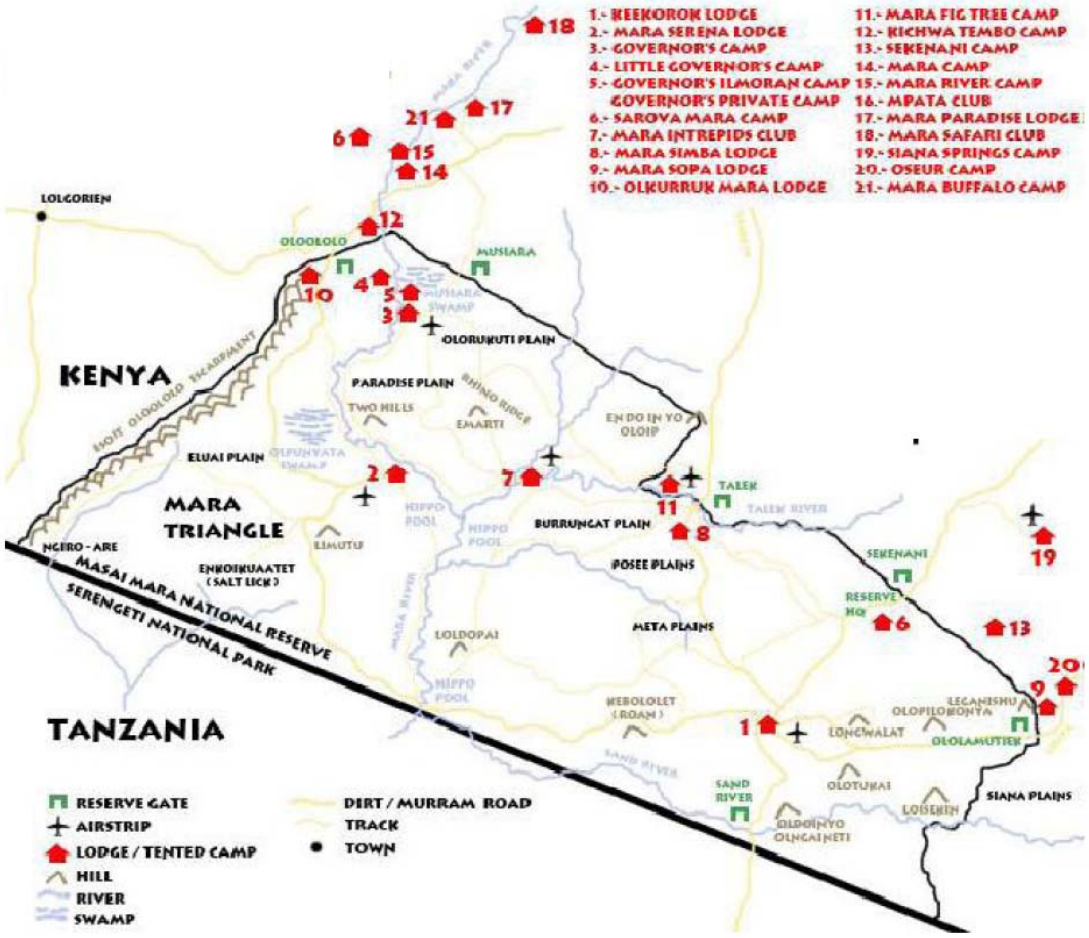
Maasai Mara National Reserve (Figure 3.1) is located at about 300 Km Northwest of the Kenyan capital, Nairobi in Narok South District, south rift valley on the north of Tanzania (Serneels & Lambin, 2001). Its exact location is at 10 31'and 10 45' South and between 34 25' East. MMNR covers an area of approximately 1510 $km^2$. It lies at an average altitude of 2100 meters above the sea level in the high altitude area. The study area is surrounded by the Loita plains on the north, the Siria escarpment on the west and Loita hills on the east. The study area is bordered to the north by Koiyiaki, Lemek, Ol kinyei, north east Maji moto and North-West Kimintet ranges. To the east is Siani, Naikara and to the south east is Olderrkesi ranges. To the west the study area is bordered by Oloirieni and Kerinkani ranges (ibid)

#### 3.1.2 The climate

The weather patterns within the study areas are strongly influenced by altitude and physical features (escarpments, lakes and volcanic peaks). The areas have maximum temperature that varies over the year between 26.5°C and 31°C with a minimum temperature range of 8°C and 14°C.

Rainfall is seasonal and is determined by large scale weather patterns and locally influenced by topographic features. it has two rainy seasons with the average rainfall ranging from 500mm to 1,800mm annually with the long rains falling between the months of March to May while December to February are dry months, June and July are periods of short rains. This defines the peak periods of tourists between the months of December to February and the low seasons between the months of March to May.

**Figure 3.1: Map for the greater Mara ecosystem**




Source: Kenya Tourism Board (KTB)

### 3.1.4 Demographic characteristics

The demographic composition of the study area mostly consists of the Maasai community with a greater percentage and other Kenyan communities in a smaller percentage. Their cultural values and traditions stand out as a unique cultural tourism product in the world. In the recently released 2009 population census the study's population stood at 850,920. The growth rate is far above the national average of about 3.3 %, a trend that may have serious implications on the resources upon which tourism depends. The population density per square kilometer is approximated to be 47 people (GoK, 2009).

### 3.1.5 Ecological setup

The Maasai Mara region consists of about 1.3 million wildebeests, together with herds of 200,000 Zebra, 500,000 Thomson Gazelle, 97,000 Topi and 18,000 Eland. They form a vast assemblage of ungulates whose annual movement back and forth across the border into Tanzania. This makes MMNR to be listed among the seventy wonders of the world. The migratory nature enables these wild beasts to utilize the highly seasonal availability of grass and water (Ondimu, 2006) and on the other hand promoting tourism in both sides. In general, the Maasai Mara region is rich in resident game with over 95 species recorded and a plentiful range of over 480 species of bird life.

### 3.1.6 Socio - economic setup

Land use in the area is predominantly tourism, agriculture and pastrolism. Small–scale agriculture has started to take place since locals have realized that they are getting very little from tourism. Tourism activities and pastroralism is the predominant land cover in the region where it constitutes some 85% of the land use within the reserve but in the urban areas, there is considerable commercial activities taking place which are also dependants of tourism activities from MMNR.

## 3.2 Research Design

The study adopted an exploratory approach using descriptive survey design to assess existence of a relationship between environmental impacts and wildlife based tourism activities as described by Kothari (2004) and Orodho (2004). The descriptive survey design can measure differences between or from among a variety of people, subjects or phenomena. Dennis and Duncan (2008) further argues that this study provide an overview of the outcome and the characteristics associated with it, at a specific point in time and entails collecting data concerning one point in time. This fact is supported by Orodho (2004) who argue that it enables multiple outcomes and exposures to be studied hence allowing data on all variables to be collected at the same time. It was therefore suitable for this study, since it is faster, requires less time and resources and at the same time allows gain of insights and familiarity for later investigation or undertakings.

## 3.3 Target Population

The target population comprised of tourists, Community members, tourist facility managers and tour operators. Included in this study, was also county government officers.

## 3.4 Sample Size and Sampling Techniques

Multistage sampling approach was used for this study. First, the target population was first stratified into tourists, local community members, tour operator and tourist facility managers. Then convenient sampling was used to select respondents from each stratum

for interview. The tourist facilities (hotels) were, however, selected by simple random sampling a technique also used to select county government officers for the interview guide administration. This sampling technique allowed for higher chances of attaining the desired respondent representation to be achieved from the various strata. To test the hypothesis "wildlife based tourism in Masaai Mara National Reserve has both benefits and negative environmental impacts", the respondents were asked about their opinions, on a five-point Likert scale, to indicate the extent to which they agreed or disagreed with statement concerning benefits and negative impacts on WBT in MMNR. The sampled population was 100 respondents distributed as: 20 tour operators, 10 hospitality facility managers (Mara Serena lodge, Keekorok lodge, Mara Sopa lodge, Mara Simba lodge, Sarova Mara camp, Siana Springs camp, Mara Fig Tree camp, Sekenani camp, Seasons hotel and Mara Interpids club). Some of the facilities interviewed were located out of the reserve for the purpose of extensive coverage of impacts that affects the operators who depend on the reserve. 35 tourists and 35 questionnaires were administered to the locals using convenience sampling technique around Sekeneni gate, Ololamutiek gate, Sand river gate and Talek gate.

**Table: 3.1 Data collection instruments; validity and reliability**

| **Data collection Instrument** | **Validity** | **Reliability** |
|---|---|---|
| Questionnaire | Part of the target group was literate hence reliable information was obtained. | The questionnaire contained both closed and open ended relevant questions. |
| Interview Schedules | Interview schedules and guides was prepared and used for Narok County Council to obtain relevant information. | Information obtained allowed clarifications of unclear views or questions. |
| Observations | Observation checklist guides were prepared and used to guide observation in order to obtain relevant information. | The researcher was there physically hence the information obtained was substantially reliable. The observed data was recorded in field note book, memory and pictures. |

| | | |
|---|---|---|
| Secondary Information | The information provided the requisite information which informed the study background, literature review and variables necessary to achieve the study goal. | Relevant policy documents, reports, publications and legislation available. |
| Photography | Pictures and photography was used to validate the collected data. The camera was used to be an extension of a researcher's memory. | Relevant photographs made records that were analysed and used to illustrate the assessment report. |

Source: Author, 2012

### 3.5 Data collection procedures and instruments

Secondary Data which involved a thorough and extensive literature review of relevant documents on the study area and related research was done data from journals, workshop documents and MMNR. Also GIS data and rainfall data was used for this study. The review provided valuable insight into the study area and issues surrounding the research core objectives, relevant literature, the methodological approach for the general survey, and discussion of the research findings. Primary Data collection activities targeted primary stakeholders in the reserve fringe communities and key informants in the county government.

Structured questionnaire (Appendix ii-v) was administered to household heads in local communities, tourists, tour operators and tour facility managers by the researcher. The questionnaires elicited information on responded socio-demographic characteristics, who the stakeholders are, benefits of wildlife based tourism and stakeholders' views on environmental negative impacts of tourism on the reserve (Table 3.2).

Administration of questionnaire was done through face-to-face interviewing of respondents. The face-to-face method involved the interviewer meeting the respondents to seek responses to the questions in the questionnaire at workplaces, homes of respondents or anywhere the target populace is found during the time of visit (plate 3.1). Respondents who were literate were given the questionnaires to fill themselves. Those who were not literate were assisted by a facilitator in translating the questions into the

local dialect (Maasai/Kiswahili). Random checks made by the researcher on completed interviews to identify errors in order to rectify incongruence in subsequent interviews were done.

According to Panneerselvam (2008) face-to-face interview is a detailed in-depth survey method which seeks responses with better precision and flexibility since follow ups can be made to seek more clarification when it is necessary. However, the method is time-consuming and costly.

**Plate 3.1: Researcher administering questionnaires to a Local Community at MMNR**


Source: Field Survey 2012.

**Table 3.2: Methods of data collection, analysis and presentation**

| Objectives | Variables | Types and sources of Data | Methods and tools of data collection used | Methods of data analysis and presentation used |
|---|---|---|---|---|
| 1. To identify the benefits of wildlife based tourism in Masaai Mara National Reserve. | Benefits | Both primary and secondary data from respondents and secondary materials | Interviews, surveys and study of secondary information using questionnaires, interview schedules and document analysis | Both qualitative and quantitative data analysis methods like verbatim and descriptive statistics using SPSS and MS Excel |
| **2.** To explore the status change of Maasai Mara National Reserve over the last four decades | Status change | Secondary data from existing documents and records. | Study of secondary data using GIS Archview | Germin GPS units were downloaded using Oziexplorer software and exported into Archview GIS programme for map generation and spatial analysis. |
| 3. To determine various negative impacts of wildlife based tourism | Negative impacts of wildlife based tourism. | Both primary and secondary data Collected from respondents and from documents and records | Interviews, surveys and study of secondary information using questionnaires, interview schedules and document analysis | Qualitative and descriptive analysis Using Statistical Package for Social Sciences (SPSS) and Microsoft (MS) Excel tools presented in Graphs, tables, plates and text |
| 4. To explore the roles of different stakeholders in the mitigation and control of impacts of wildlife based tourism in Maasai Mara National Reserve. | Mitigation measures Control of impacts Strategies Activities Roles Programmes Initiatives Challenges Opportunities | Both primary and secondary data Collected from respondents and from existing documents and records | Interviews, surveys, observations, photography and document analysis using a camera, questionnaires and observation checklists | Both qualitative and quantitative data analysis methods like verbatim and descriptive statistics using SPSS and MS Excel Presented in graphs, tables, plates, text and charts |

Source: Author, 2012

### 3.6 Data reliability and validity

The research design was aimed at ensuring high quality, valid and reliable research (table 3.1). Data triangulation research approach involving diverse data sources to explore the same phenomenon (Arksey & Knight, 1999) was employed so as to increase reliability and validity. Data was collected from different stakeholders seeking out their views. According to de Jager (2002) multiple data sources increase the quality, validity and reliability of the evidence.

### 3.7 Data Analysis

The statistical package for social scientists (SPSS 16.0 for Windows) was used to capture and analyze the structured questionnaire data. Descriptive statistics were used to describe socio-demographic characteristics of respondents and their views on WBT. Frequencies of selected variables for all respondents were computed with percentages. Cross tabulations of selected variables were produced as a precursor to observe association between different variables (benefits, negative environmental impacts of WBT, environmental status, stakeholders play unique roles towards the mitigation and control of impacts) by using chi-square test( see also table 3.2).

### 3.8 Logistical and Ethical Consideration

A letter of introduction was obtained from the Graduate School, Nairobi University which the researcher used to seek permission from the National Commission for Science, Technology & Innovation (NACOSTI) to conduct the survey. These approvals were used to seek county administrative authorization to carry out the study. Informed consent was obtained from study participants prior to their enrollment into the study. Participation in the study was voluntary and participants were free to withdraw from the study at any stage during the interview. Confidentiality of the information from the study participants was maintained throughout the study. In addition, codes were used to maintain anonymity of all participants and keep their information confidential.

# CHAPTER FOUR: RESULTS AND DISCUSSION

## 4.0 Introduction

This chapter presents the study findings by research questions and study objectives. Relevant data, in relation to research objectives and study variables are analyzed, presented and interpreted using methods identified in chapter three. The analysis is accompanied by a comprehensive discussion on the interpretation of the findings.

### 4.1.1 Demographic Information

A total of 100 questionnaires were distributed to local community members (35), tour operators (20), tourists (35) and hospitality managers (10). Of these 80 questionnaires were successfully completed and returned by respondents, thus giving questionnaire response rate of 80%. Table 4.1 shows the distribution of respondents by gender, age, level of academic occupation. Of the 80 respondents, 51 (63.75%) were males and 29 (36.25%) were females; hence the research sample met gender balance. Concerning age, 68.75% of the respondents were forty years and below. Concerning education, the table shows that 36.25% of the respondents had a diploma education and above.

**Table 4.1: Demographic data of the study sample**

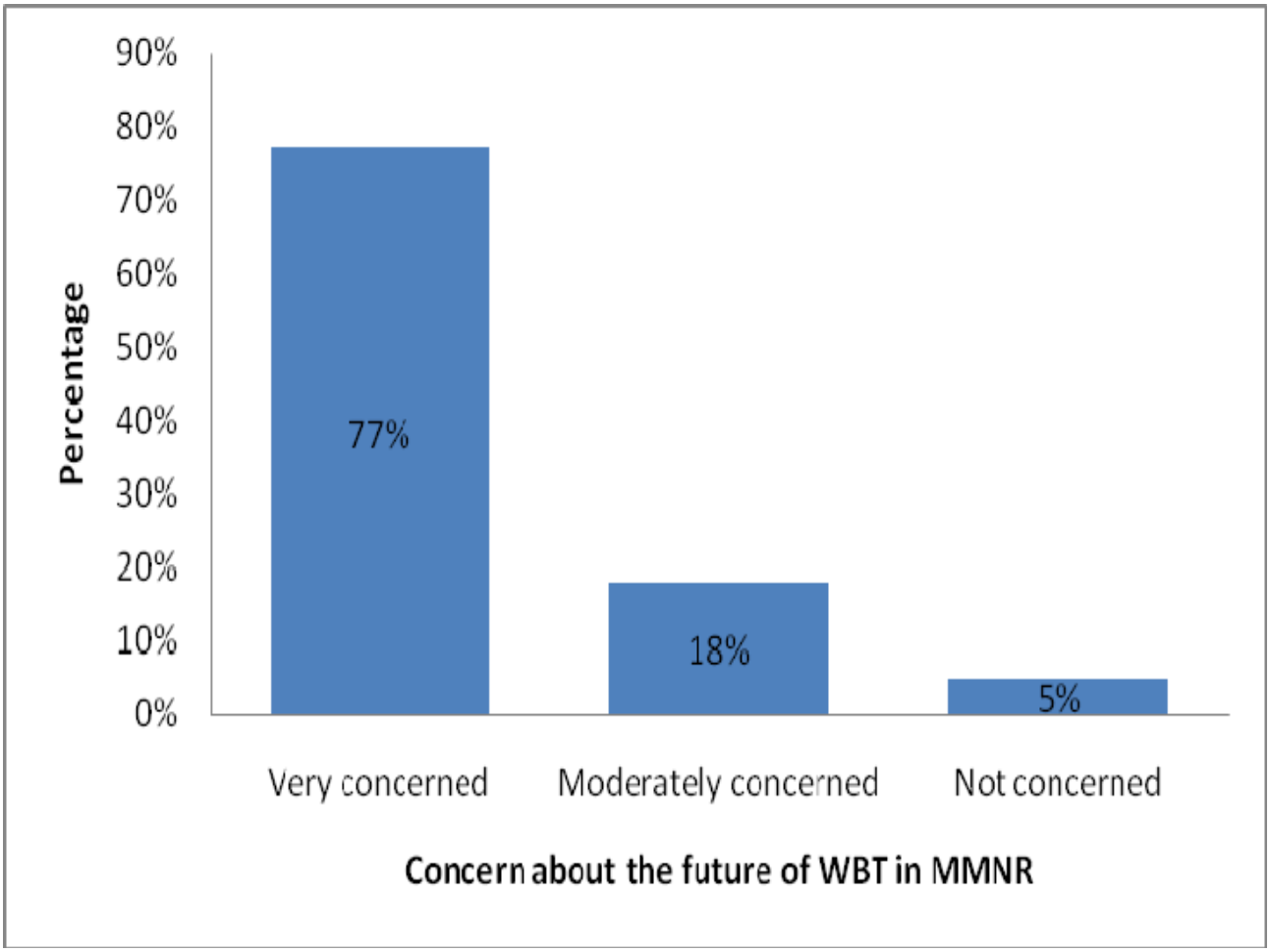
| Social Demographic Factor (N= 80) | Frequency | Percent |
|---|---|---|
| **Gender** | | |
| Male | 51 | 63.75 |
| Female | 29 | 36.25 |
| **Management Level** | | |
| 20-30 Yrs | 21 | 26.25 |
| 31-40 Yrs | 34 | 42.50 |
| 41-50 Yrs | 16 | 20.00 |
| Above 50 Yrs | 9 | 11.25 |
| **Education Level** | | |
| Primary | 28 | 35.00 |
| secondary | 23 | 28.75 |
| Diploma cert | 17 | 21.25 |
| Bachelors | 10 | 12.50 |
| Masters | 2 | 2.50 |

Source: Field Survey, 2012.

### 4.1.2 Concern about the future of WBT in MMNR.

WBT is indeed a significant tourism segment which contributes a lot in terms of scenic beauty, employment and revenue generation. This has generated a lot of interest and concern about WBT. The findings from the study indicate that 77% of the study respondents were very concerned about the future of WBT, 18% were moderately concerned while 5% were not concerned at all about WBT arguing that, they have for a long time been negatively affected by its existence (figure 4.1). From the findings it can be argued that the local people are aware of MMNR existence and in one way or another think about its wellbeing.

**Figure 4.1 Concern about the future of WBT in MMNR.**

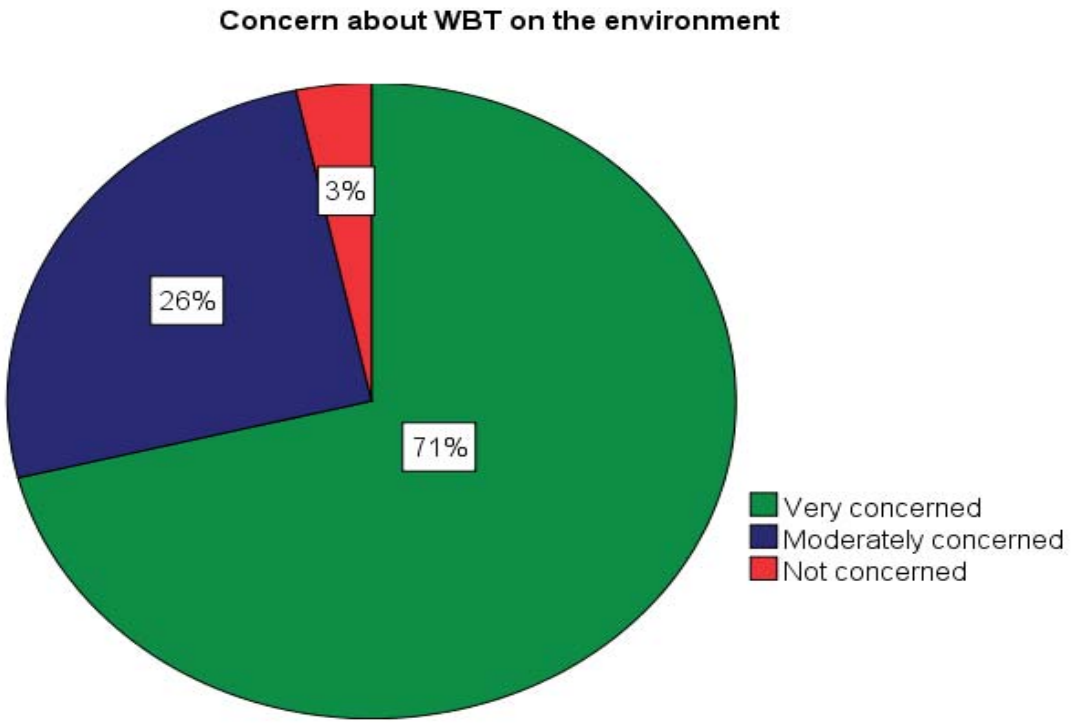



Source: Field Survey, 2012.

### 4.1.3 Concern about WBT on the Environment

WBT depends on wildlife for its survival since tourism and wildlife protection are two sides of the same coin. The survey data shows that 71% of the respondents were very concerned about the environment where tourism and the wildlife draws there living, 26% were moderately concerned while 3% of the respondents were not concerned (figure 4.2). In line with this findings Natrona *et-al*, (2002) in their study of the impacts of wildlife tourism on protected parks established that tourism creates pressures on different domains especially the natural environment, the built environment and cultural resources. The study findings are further supported by Kumar and Ramaswamy (2005) who demonstrated that wildlife tourism leads to loss of natural capital, scenic beauty of landscapes, social environment, land morphology and topology.

**Figure 4.2: Concern about WBT on the Environment.**




Source: Field Survey Data, 2012

### 4.1.4 Tourist preferences for attractions in MMNR

MMNR is one of the most preferred tourist destinations in East Africa owing to its different and tourist specific attractions (Abele, 2003). These attractions have varied features that tourists attach different levels of significance to. Figure 4.3 shows that 67% of the tourists interviewed rate viewing the big five as the most important attraction while 60% value other high mammal diversity and 17% high floral diversity. Meanwhile 13% prefer high bird diversity and 7% are interested on attractive scenery. This finding suggests that respondents are not very enthusiastic with attractive scenery like grasslands, landscape, terrain, high bird diversity and high floral diversity. Therefore this means areas which do not have a high diversity of mammals or are not endowed with the 'big five' are not likely to attract tourists and thus will not benefit from tourist entry fees. These views are echoed with other studies by other researchers. For example, Kerley *et al.* (2003), found out that tourist preferences for mega-fauna leads to an under appreciation of biodiversity. Goodwin and Leader Williams, 2000 in their study on the environmental impacts of tourism also noted that the preferences of tourists on the mega-fauna may distort management priorities to the detriment of wider biodiversity conservation.

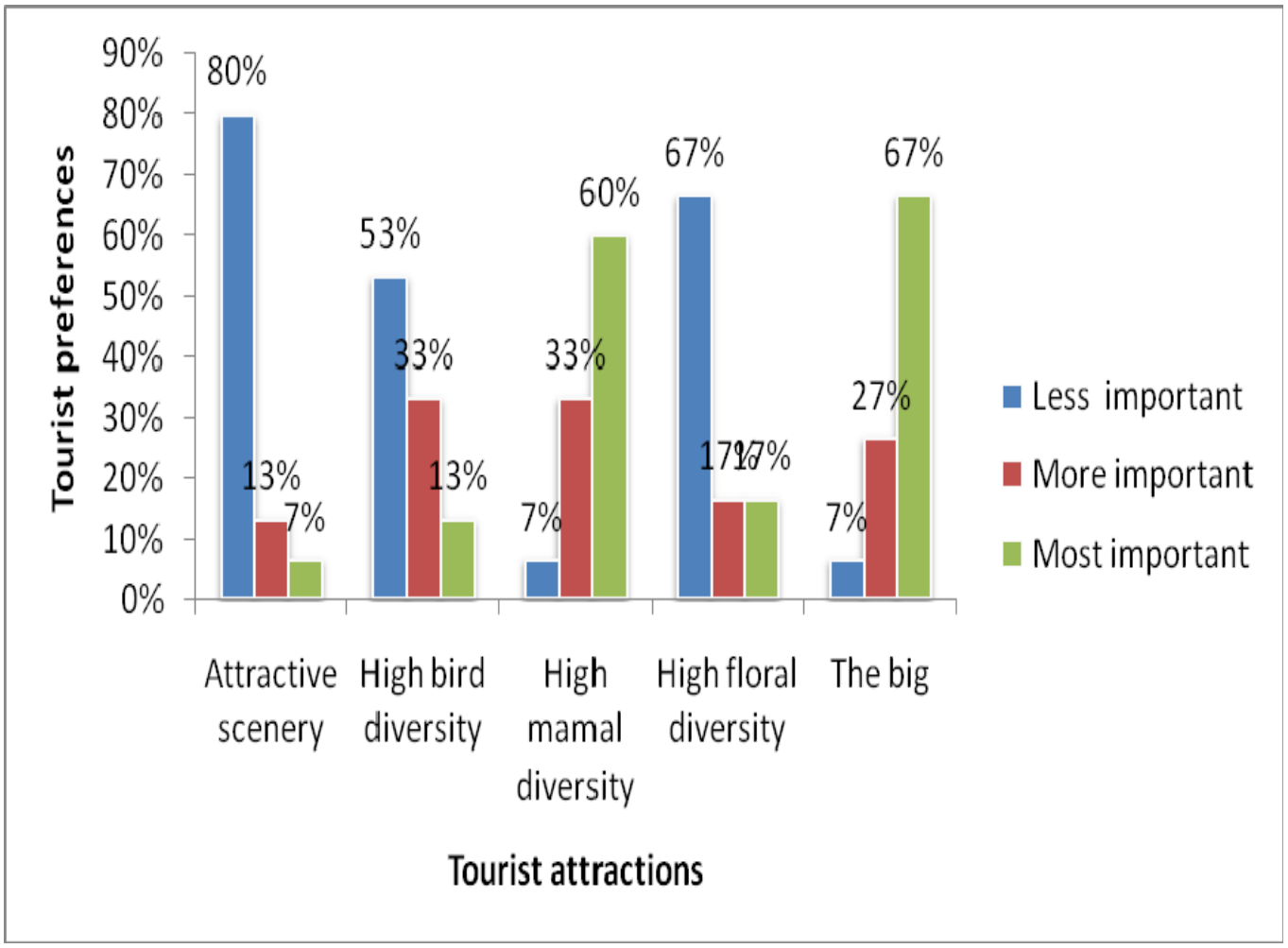
## 4.2. The benefits of wildlife based tourism in Masaai Mara National Reserve

### 4.2.1 Enhancement of WBT in MMNR

In order to reap meaningful benefits from WBT MMNR needs to implement various measures to increase tourists, minimize expenditure and maximize income. In an attempt to determine this various categories, the respondents were asked to give their opinion on how they think the benefits of wildlife based tourism in Maasai Mara National Reserve can be enhanced. Increasing tourists' fees topped the list of the local community; education and creation of awareness were cited as a necessary requirement at 67% and 61% of the respondents respectively (figure 4.4). On the other hand 44% of the local community recommended for rigorous marketing of WBT products and involvement of all stakeholders in decision making. While 33% of local respondents cited development

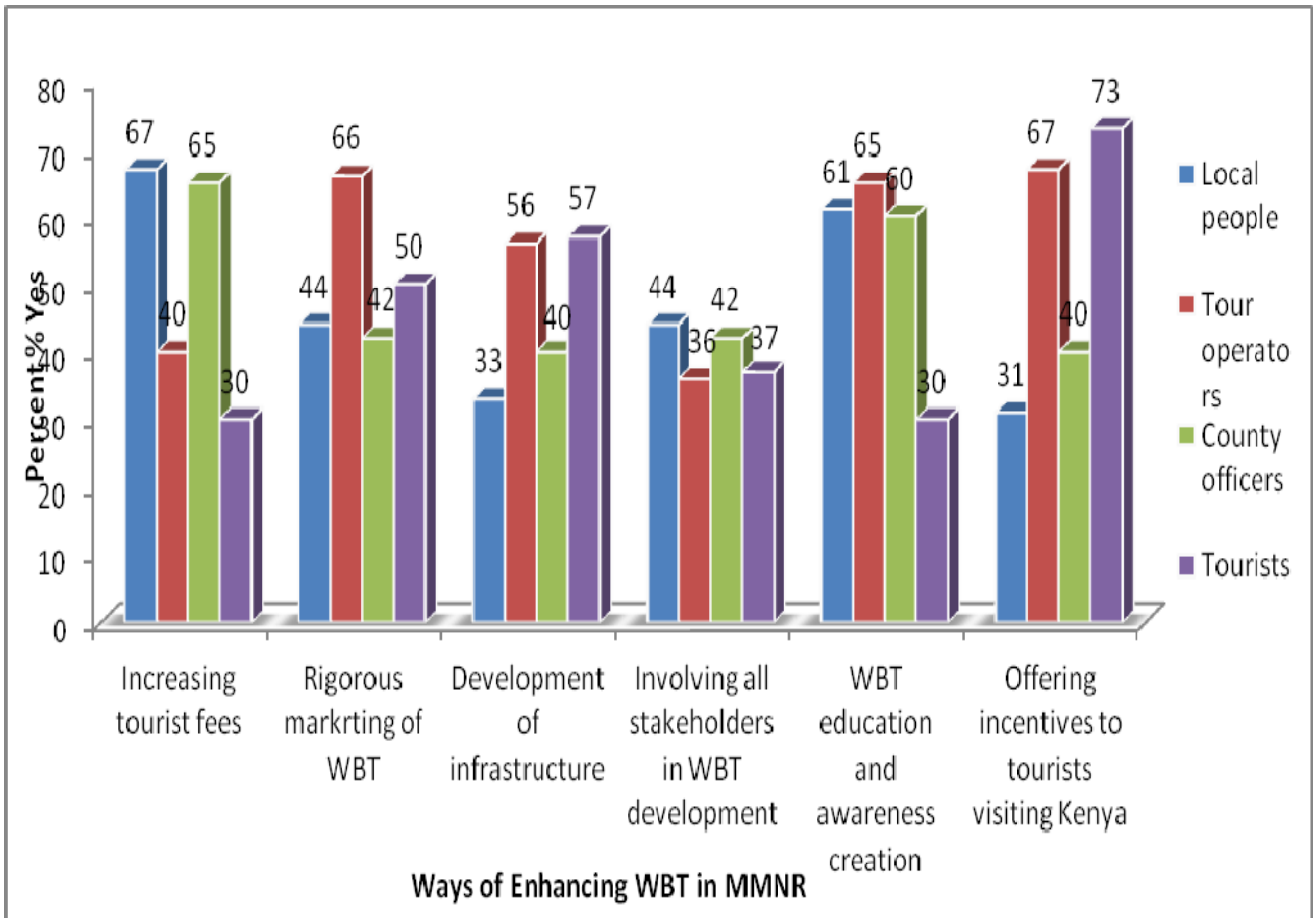
of infrastructures like accessible roads and upgrading of public airstrips to international standards. 31% of the local community recommended for offering of incentives to the industry operators (hotels and tour operators) like tax incentives and visa application waivers to tourists.

**Figure 4.3 Tourist Preferences for Attractions in MMNR**




Source: Field Survey 2012.

**Figure: 4.4 Enhancement of WBT in MMNR**




Source: Field Survey Data, 2012.

Further, the study findings shows that 67% of tour operators favoured offering of incentives to tourists visiting the country, while 65% agreed to conduct WBT education and create awareness. 66% of tour operators necessitated for rigorous marketing of WBT products. As indicated by this study infrastructure development is a core factor in tourism development and more so in maximizing tourism earning. Literatures support this fact by citing several instances that make developing nations to miss out on foreign exchange earnings. Many tourism enterprises in the Third World, Kenya included, are owned and managed by foreign companies, usually multinational corporations like hotel chains and some safari companies. For example, South African companies have invested large sums of money in hotel development (Sindiga, 1999) thus making them monopolize the

organization of international mass tourism (Brohman, 1996) which makes them earn handsome profits by charging management fees and through various licensing, franchise and service agreements. This keeps the parent company in a controlling position thereby allowing it to repatriate most of the foreign exchange (Sindiga, 1999). Relatively large amounts of foreign exchange are lost to the developed world because of the structural dependency created through widespread foreign ownership, control and management of tourism enterprises in the Third World (Lea, 1993).

A growing literature, however, is skeptical on major determinants of tourism development. Sharpley *et al*. (1996) argue that tourists are highly sensitive to political instability which threatens their personal safety and security. So apart from developing the physical tourism infrastructure, political stability must be cultivated as an important factor in influencing tourism. This in my view means that only countries which practice democratic ideals, adhere to the rule of law, and respect human rights will maintain political stability essential for tourism development. This therefore, becomes more challenging to achieve than all the factors combined.

### 4.2.2 Benefits of WBT in MMNR

When asked to name the benefits of wildlife based tourism in Maasai Mara National Reserve, 92% of the respondents were of the opinion that it brings about development of tourism facilities (such as Hotels, Lodges, and Camp base), 90% indicated employment opportunities, 80% indicated development of infrastructures such as roads, electricity, and communication faculties, 47% indicated cultural interactions between the locals and the tourists while 40% indicated a ready market for local products such as Maasai beads, Shukas and other African attires (figure 4.5). This finding closely agrees with those from interview guide with Narok County officials. One of the county official said "…some of our people work as security guards, waiters and even tour guides. We also get revenue from taxes levied on tour vehicle parking fees and curio venders among others".

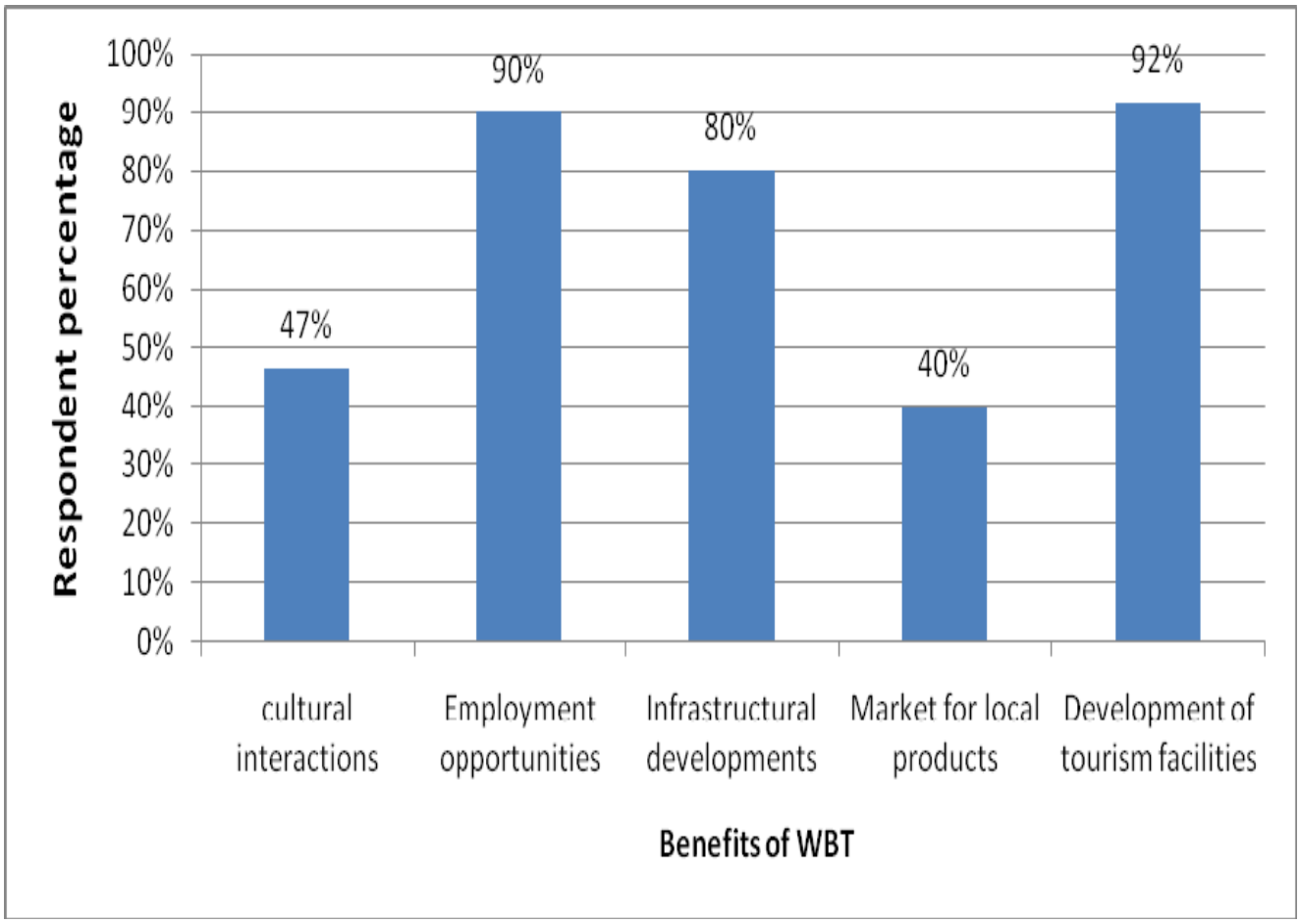
Many international studies have also shown that tourism generates economic benefits for the host country. Uddhammar (2006) in his study on comparing importance of national economic activities demonstrated that tourism's economic significance gives the industry

greater respect among the business community; the tourism economy contributes immensely to national income, attracts foreign exchange and provides a chance to make known the nation's heritage and culture. Sindiga (1999) notes that tourism is labour-intensive and people serve in various sub-sectors of the industry including tour guiding, nature and cultural interpretation, game viewing, travel and transport services, promotion, sport, and in the area of food, beverage and alcohol service, and accommodation. Other tourism-related employment is in entertainment as well as the arts and hand-craft curios.

Sindiga (1999) also argues that apart from injecting foreign exchange earnings into the economy, tourism generates government revenue through various taxes. Such include customs and excise duties for imports; sales tax and value added tax for goods bought in the local market; accommodation taxes and training levies on hotel guests; concession or rental fees paid by game lodges and camp sites; and trade licenses and company taxes paid by various enterprises.

Finally, there are strong arguments in support of wildlife-based tourism playing a central role in conservation and rural development in sub-Saharan Africa. Most tourism enterprises in the region are based on natural resources thus creating important economic incentives for local and national investments in conserving biodiversity. The tourism economy contributes to national income, attracts foreign exchange and provides a chance to make known the nation's heritage and culture (Uddhammar, 2006).

**Figure 4.5: Benefits of WBT in MMNR**




Source: Field Survey 2012

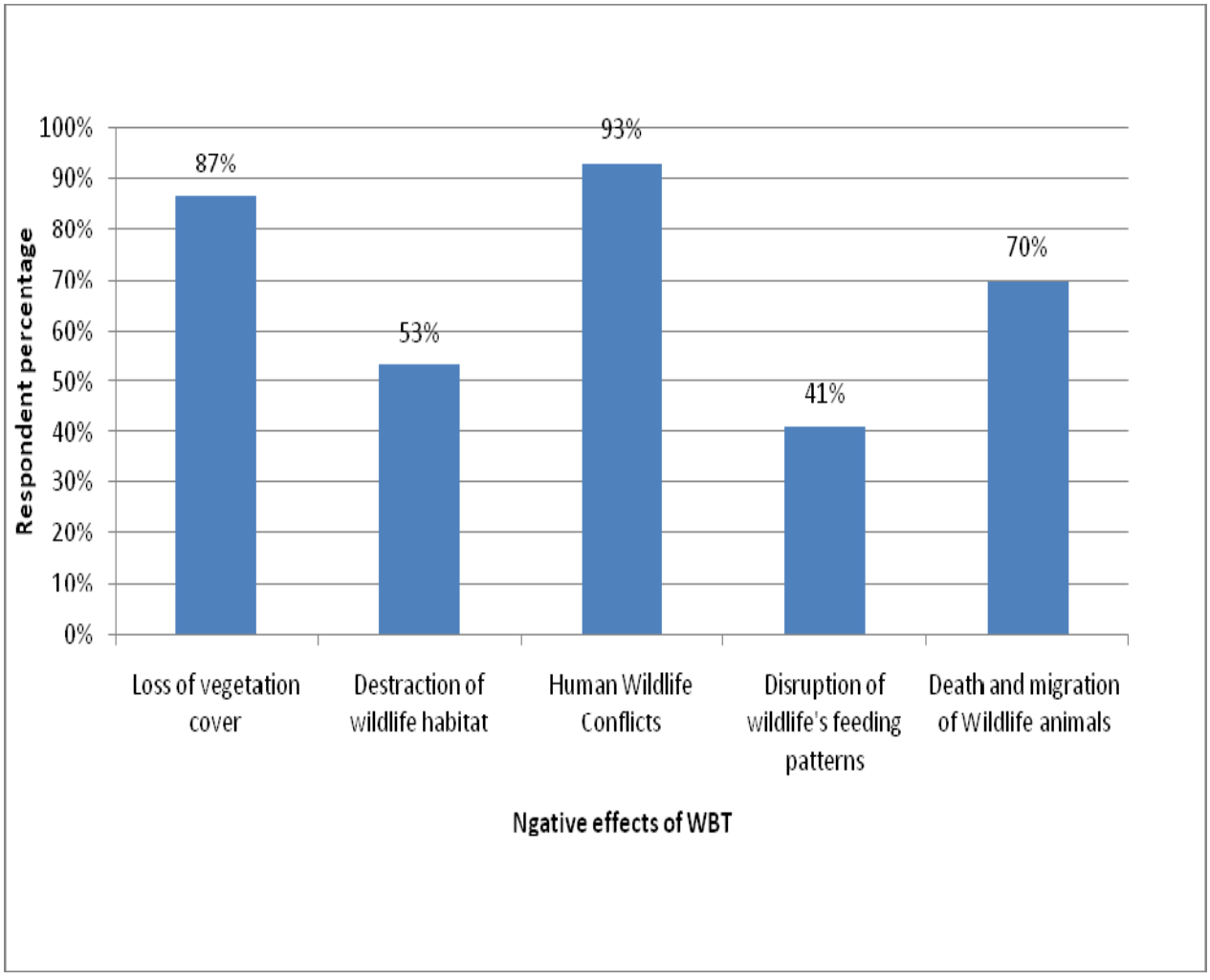
### 4.3 Negative environmental impacts of wildlife based tourism in MMNR

#### 4.3.1 Negative environmental impacts of WBT in MMNR

Although environmental impacts of tourism in Kenya are largely un-quantified, they are widely acknowledged as substantial. To determine what they are, the respondents were asked to list the negative impacts of wildlife based tourism in Maasai Mara National Reserve. The findings are illustrated in figure 4.6 below. The result show that 93% of the respondents cited human wildlife conflict that is rampant in the region is partly caused by WBT; construction of tourism facilities and other tourism related infrastructures including irresponsible tourists behavior like driving off the designated paths, feeding of

wild animals, irresponsible waste disposal and wild fires caused by cigarette remains (87%), death and migration of some wildlife animals due to consumption of poisonous wastes that are left behind by tourists in the reserve and being scared (70%), destruction of wildlife habitat (53%) and disruption of wildlife's feeding and breeding patterns (41%). Literature has acknowledged existence of negative environmental tourism impacts (Kumar and Ramaswamy, 2005), however, Ikiara and Okech (2002) argue that such impacts have not been assessed.

**Figure 4.6: Negative Impacts of WBT in MMNR.**




Source: Field Survey 2012

In his study of tourism cause problems of MMNR, Gakahu (1992) noted that development of tourist facilities in the reserve had been rapid in response to the increasing number of visitors. His report indicates that the first lodge in MMNR (Kekorok) was established in 1963 and by June 1997 the number of permanent hotels had reached 25, excluding outside tented camps and temporary tented camps inside the reserve. Ikiara and Okech (2002) have noted that increased tourist facilities in the reserve have caused the loss of habitat and naturalness of the area. Lodges have garbage and sewage disposal problems. Garbage attracts carrion-eaters such as hyenas, baboons, velvet monkeys and marabou storks. These problems are of concern to the reserve's management because animals can be obvious threats to people, including tourists.

Kumar and Ramaswamy (2005) further notes that tourism leads loss of natural habitat and scenic beauty of landscapes, morphological and topology of sites; and on the social environment. The magnitude of these impacts depends on the intensity of tourism development and use, resilience of the ecosystem, long-term versus short-term tourism planning and the extent of modification of the tourism site (Ikiara and Okech, 2002).

Kerley *et al*. (2003), found out that tourist preferences for mega-fauna leads to under appreciation of biodiversity. Goodwin and Leader-Williams (2000) also supported this fact by suggesting that the dependence of tourism operations on mega-fauna may distort management priorities to the detriment of wider biodiversity conservation. None of the respondents interviewed in this study noted this issue may be due to fact that this view is rather academic and likely to be elusive to ordinally people.

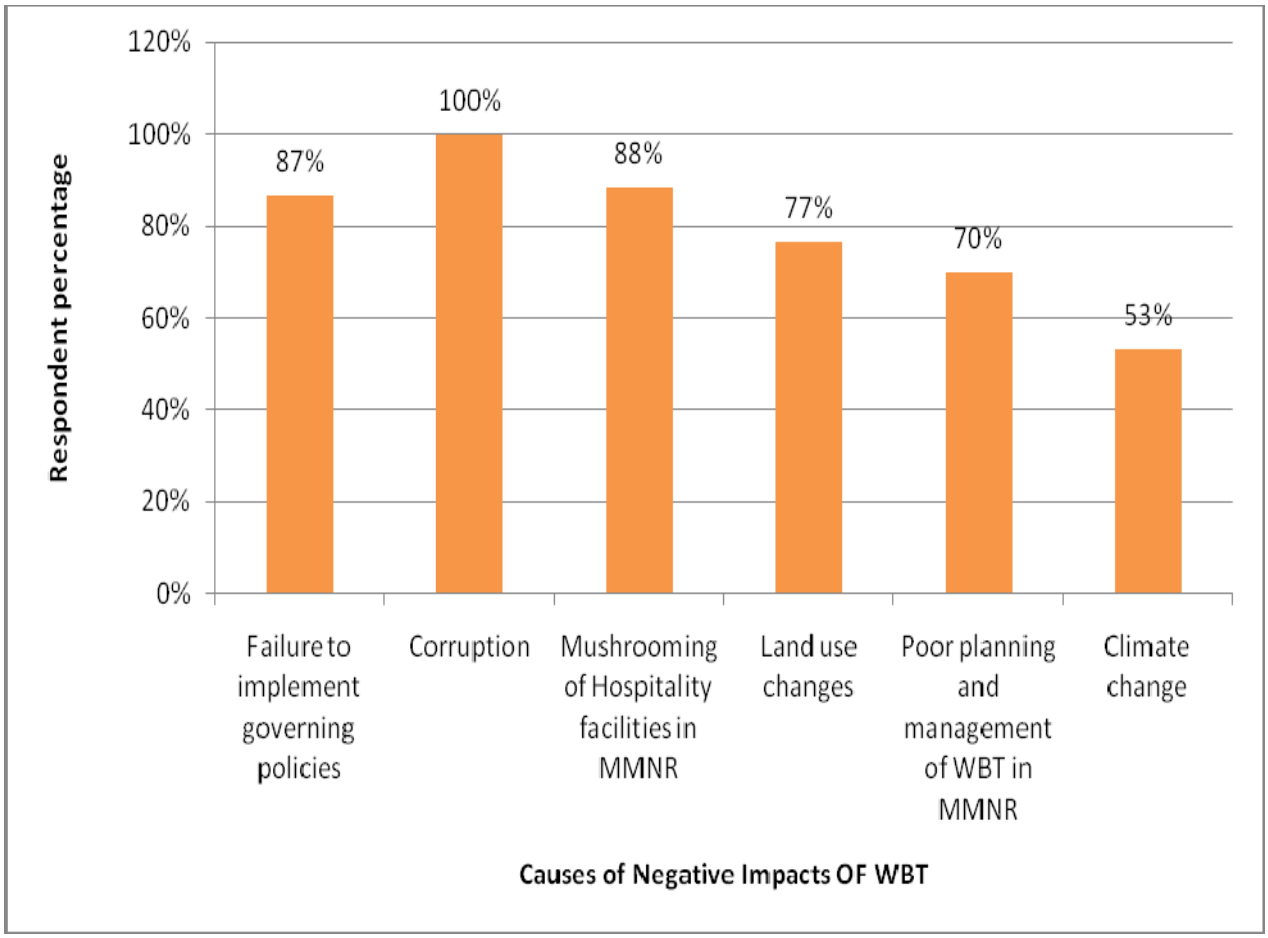
### 4.3.2 Causes of negative impacts of WBT in MMNR

This study held that the negative of impacts WBT are likely to be caused by certain underlying factors. To qualify this view respondents were asked to state what they thought may cause negative impacts. Figure 4.7 summarizes the findings of this variable. Top on the list was corruption (100%), mushrooming of hospitality facilities have taken up land in and adjacent to MMNR (88%), failure to enforce government policies due to weak institutions (87%), land use change as more land is demanded for agricultural

purposes (77%) and poor planning and management of WBT (70%). Climate change effects were also cited by 53% of the respondents.

These findings agrees with the existing research work which especially emphasizes land use change as one factor which all management agencies must address. A growing body of work both theoretical (Ostrom *et al.*, 1999) and empirical (IIED, 1994) has suggested that wildlife conservation is unlikely to succeed in sub-Saharan Africa unless it is able to enlist the support of reserve-adjacent dwellers. This is supported by a growing body of literature which indicates a close association between rangeland, land use and wildlife conservation. Pastoralist livestock resource use shows strong parallels with that of wildlife (Homewood and Brockington, 1999). Unfenced savanna rangelands under extensive pastoralist use can be highly compatible with wildlife conservation (Ibid), particularly around the Serengeti-Mara Ecosystem (Homewood *et al.*, 2001). Where savanna rangelands are fenced and/or converted to other forms of land use, wildlife populations decline and disappear (Ibid). Conservation of wildlife inside protected areas to large extent, therefore, depends on surrounding areas acting as buffer zones and dispersal areas (Homewood *et al.*, 2001). The progressive conversion of those buffer zones to alternative uses and the concomitant exclusion of wildlife have led to a drastic decline in wildlife populations (50% decline in Kenya over the last two decades, primarily through habitat loss (Homewood *et al.*, 2001; Ottichilo *et al.*, 2001).

**Figure: 4.7 Causes of Negative Impacts of WBT in MMNR**



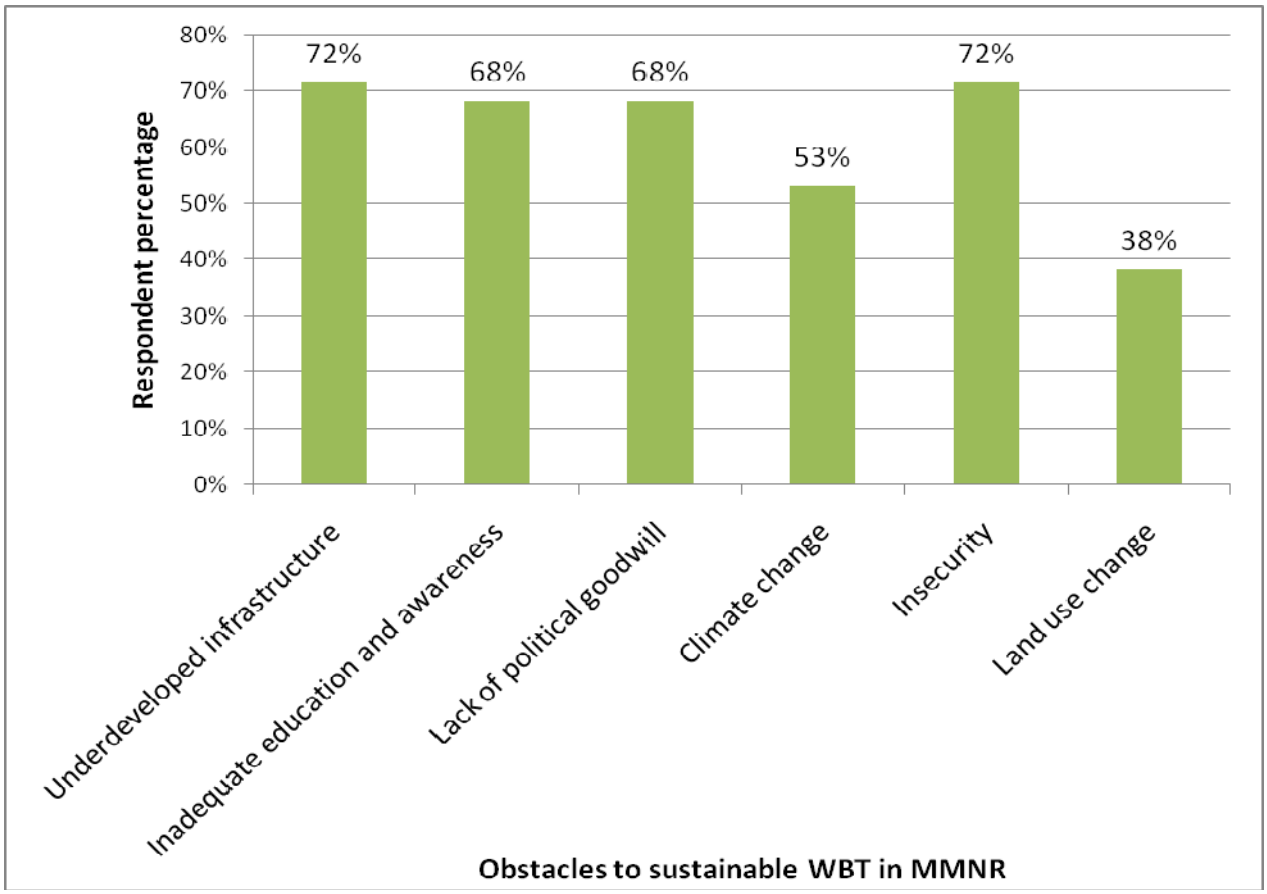

Source: Field Survey 2012

### 4.3.3 Obstacles to sustainable WBT in MMNR

Various efforts have been made to counter the negative impacts and challenges of WBT in MMNR's sustainable growth. Unfortunately, a number of obstacles to sustainable WBT in MMNR still exist and militate against these efforts made to sustainable tourism development. According to the study these obstacles include: insecurity (72%); underdeveloped infrastructure like roads, green hotels and lodges (72%); 68% of the inadequate education and awareness (68%); lack of political good will (68%); climate change (53%) and land use change (38%) (Figure 4.8). From the guided interviews it was noted that local communities view MMNR as the main obstacles to their development

since it's a part of their land but government took advantage of their illiteracy grabbed land from them.

**Figure 4.8: Obstacles to Sustainable WBT in MMNR.**




Source: Field Survey 2012

Several studies have linked tourism development to tourism sustainability. Binns (1995) argues that tourism development should not only refer to economic matters but should encompass social, economic, environmental and ethical considerations such that its measurement may incorporate indicators of poverty, unemployment, inequality and self-reliance. This statement is underscored by Carter (1991) who illustrated a cumulative relationship between tourism development, the environment and socioeconomic development. This means that if tourism is to be sustainable, then it must be economically viable, ecologically sensitive and culturally appropriate (Wall, 1997). So for WBT in MMNR to be sustainable all the issues determined by the study should be

addressed as a whole. Therefore, the present generation should leave for the next generation, a stock of quality of life assets no less than those they have inherited (Pearce *et al.*, 1989). Sustainable wildlife tourism is the utilization and management of renewable wildlife resources for the benefit of today's generations and at the same time making the same resources available for future generations (WCED, 1987). However, Chambers (1986) state that sustainable development appears to be the terminology of managers, and is not as yet, the terminology of the managed. As a result, in many parts of the world, the growing numbers of poor people have inevitably led to the degradation of the environment each day just to make ends meet. This suggests that the development of tourism in environments such as those of the Maasai Mara should be designed such that it does not lead to an environmental trade-off but to an improved environmental and human welfare.

### 4.3.4 WBT in MMNR is perceived to be both beneficial and has negative environmental impacts

When asked to name the benefits of wildlife based tourism in Maasai Mara National Reserve, 92% of the respondents listed development of tourism facilities, 90% indicated employment opportunities, 80% indicated development of infrastructures, 47% indicated cultural interactions between the locals and the tourists and 40% indicated a ready market for local products (details are illustrated in figure 4.5 subsection 4.2.2). Similarly negative impact result show that 93% of the respondents cited rampant human wildlife conflict, loss of vegetation cover (87%), death and migration of some wildlife animals (70%), destruction of wildlife habitat (53%) and disruption of wildlife's feeding and breeding patterns (41%) (for details check figure 4.6 in subsection 4.3.1). These data gives an overview about peoples' feelings on the impacts of WBT in MMNR.

To test the hypothesis "wildlife based tourism in Masaai Mara National Reserve has both benefits and negative environmental impacts", the respondents were asked about their opinions, on a five-point Likert scale, to indicate the extent to which they agreed or disagreed with statements concerning benefits and negative impacts on WBT in MMNR. The points ranged from 1 for strongly disagree to 5 for strongly agree. Responses to

various statements were collapsed and a composite index (mean score) computed for benefit and negative environmental impact (Table 4.2).

**Table 4.2: Impacts of WBT in MMNR**

| IMPACTS OF WBT IN MMNR | Mean | STD DEV |
|---|---|---|
| **1. Benefit of WBT in MMNR** | | |
| WBT in MMNR is beneficial because it has contributed to social amenity development in the community | 4.923 | 1.052 |
| WBT in MMNR has contributed to greater conservation effort thus maintaining the biodiversity of the park | 4.245 | 0.831 |
| **Negative environmental impact o WBT in MMNR** | | |
| WBT in MMNR has contributed to increase in HWC thus affecting the social and economic status of the surrounding community. | 3.871 | 0.542 |
| WBT has lead to decreased vegetation cover. | 4.021 | 0.326 |

Source: Field Survey 2012

Table 4.2 shows that, almost all issues scored a mean of 3.871 and above indicating that the respondents "agreed" that both benefits and negative environmental impacts result from WBT in MMNR. The average mean was 4.367 ± 1.107, thus indicating that most respondents either "agreed" or "strongly agreed" to the impact statements (Table 4.2). To determine whether group of respondents (Local community, tour operators, tourism facility managers and tourist) had an effect on the responses, cross-tabulation was done and significance assessed using Pearson $\chi^2$ at $p>0.05$. The results indicate no significant difference between groups ($\chi^2= 9.217$, df=13, $p=0.651$). The hypothesis that wildlife based tourism in Masaai Mara National Reserve has both benefits and negative environmental impacts are accepted.

### 4.4 Status change of Masaai Mara National Reserve over the last four decades

#### 4.4.1Trends in MMNR Vegetation Cover change from 1974 to 2011

One of the objectives of this research was to understand the extent, trend of vegetation cover and land use change since the MMNR gazettement in 1974 to date. To achieve this satellite images from Landsat 1 to 7 mounted with Multi-Spectral Sensors (MSS), Thematic Mapper and Enhanced Thematic Mapper Plus (ETM+) sensors were utilized. ETM+ images were obtained with Scan Line Corrector (SLC) of 2002 image and SLC of 2011 image. The selected images had a spatial resolution of 30 meters and a spectral resolution of 0.63 to 1.75 microns (μm) utilizing bands 3, 4 and 5. The images had been projected in World Global System (WGS) 1984 Universal Transverse Mercator (UTM) Zone 37N. The choice of the images was based on availability, suitability in terms of time series and clarity of images. The table 4.3 below summarizes the details of images that were used for this study.

**Table 4.3: Satellite images to be used in the study**

| Scene Capture Date | LANDSAT | SCENE PATH/ ROW | CLOUD COVER |
|---|---|---|---|
| 9TH January, 1985 | TM L1T | 169/ 61 | 0% |
| 4TH December, 1994 | TM L1T | 169/ 61 | 0% |
| 1ST February, 2002 | ETM+ L1T | 169/61 | 2% |
| 1ST January, 2011 | TM L 1 T | 169/61 | 11% |

Source: GLOVIS, 2012

Utilizing the Arc GIS 10 and World Resource Institute's & United States Geological Survey Geographical Information Systems (GIS), MMNR's land-use map was generated (figure 4.9) which was a vital tool in informing the field visits for visual interpretation.

Based on the basin's climatic conditions which influence the region's agro-climatic zone, anthropogenic activities, flora and fauna, and water distribution the Landsat images were classified into four land-use classes namely: forest/ shrub land, crop land/ range lands, water and bare land.

To determine vegetation cover change (VCC) and land use change between 1974 and 2011, Arc GIS 10 image analysis was utilized to generate Normalized Difference Vegetation Index (NDVI). NDVI utilizes the plants' green pigmentation/ chlorophyll present in plants leaves. NDVI was suitable for this study because chlorophyll absorbs more energy at ~0.45 μ (micron) (blue), marginal energy at ~0.65 μ (red) and reflects moderately at ~0.55 μ (green) and strongly reflects at ~0.86 μ (NIR) which coincides with the green color of most plants. NDVI utilizes this distinctive spectral behavior of chlorophyll for visualization, depicted by the difference between calculated solar reflection from a satellite band to chlorophyll (~0.65 μ) and a band in the red part of the visible spectrum (~0.65 μ). Values below 0.15 are not shown in NDVI but instead are replaced by natural color imagery that represents barren land (Wu, Niu, Tang, & Huang, 2008).

NDVI generated data (Table 4.4) for the period between 1974 and 2011 indicates a varying trend in vegetation cover change, there is a notable decline in vegetation cover especially on the plains which were previously dominated by the savanna grasslands. Fluctuating vegetation cover trends may have been occasioned by a complex scenario, among which wildlife based tourism could have been one of the substantial contributor. In NDVI output maps, the shades of green indicate presence of vegetation (chlorophyll). The darker the shade of green the denser and healthier the vegetation is, this are mainly forest canopies that cover the MMNR and that occur on the hills. On the plains mainly are the grasslands and shrub lands, some of which have either been destroyed through perennial over grazing or anthropogenic encroachment and the shades and intensity of green color decrease in this order.

**Figure 4.9: MMNR in Kenyan Context Showing Different Land-Uses.**

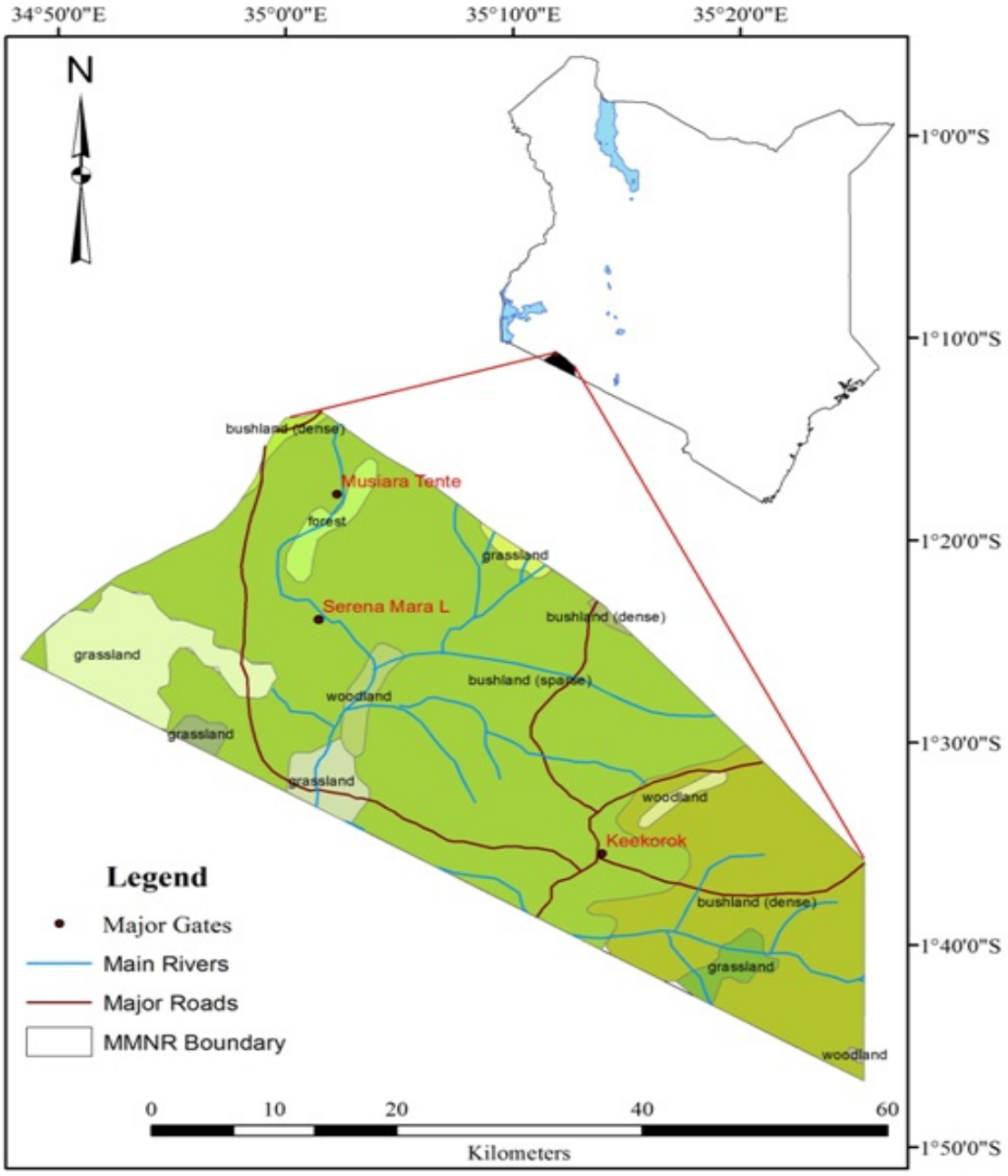


**Table 4.4: Summary of MMNR Land-use/ Land-cover change between 1985 and 2011**

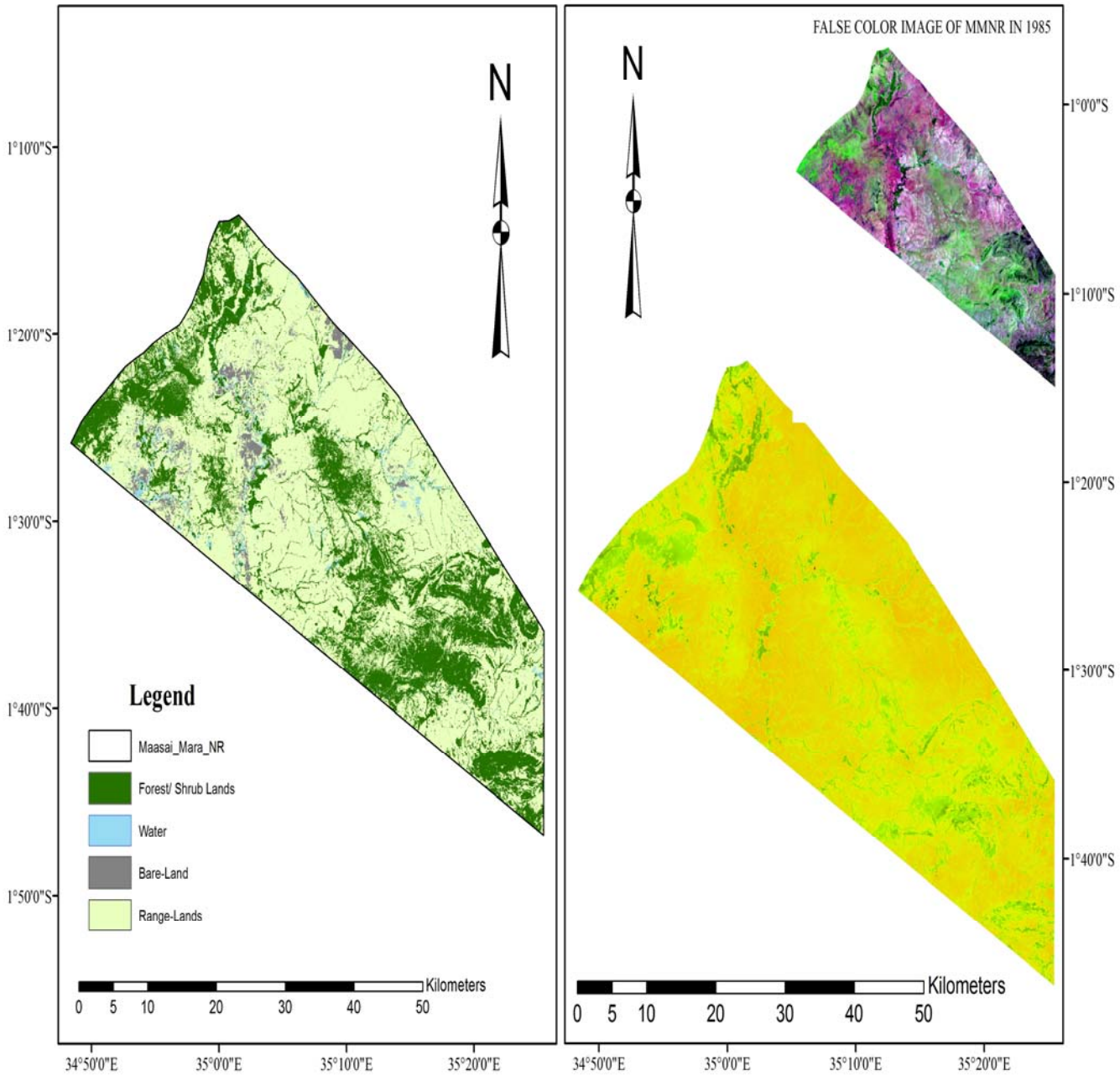
| **Land-use class** | 1985 | 1994 | 2002 | 2011 | % change 1985-2011 | $\chi^2$ test |
|---|---|---|---|---|---|---|
| | Area in square kilometers ($Km^2$) | | | | | $\chi^2$= 17.214 df= 3 p= 0.013 |
| Forest/ Shrub-land | 312.03 | 211.54 | 589.15 | 192.34 | -7.92% | |
| Crop-/Range-land | 940.2 | 1170.56 | 801.15 | 1214.33 | +18.15 | |
| Water | 3.57 | 2.78 | 2.5 | 3.63 | +0.01 | |
| Bare-land | 254.31 | 125.38 | 117.24 | 99.85 | -10.23 | |
| TOTAL | 1510.11 | 1510.25 | 1510.04 | 1510.15 | | |

Source: GLOVIS, 2012

The shades of yellowish red in Figure 4.10 below indicate poorly or non-vegetated areas, the variation in the shade arises mainly because non-vegetated areas, which are bare soils, rocky areas or due to cloud mask effect. The closer the tendency of the yellow to red coloration in the images indicates near to complete lack of vegetation. As indicated in the Figures' legend, the red colored areas represent water surfaces. The shades of green represent vegetation cover the color intensity varies with the vegetation health and intensity. Dark green areas represent forest cover especially of the securely protected areas.

Vegetation indices of NDVI image of 1985 reveal very poor vegetation cover. This can be attributed to the incidental occurrence of the image after the devastating drought of 1983/ 1984. The vegetation cover in the MMNR may have even been made worse by tourism related activities. The NDVI images figuration is presented alongside respective false color images of the same image to enhance interpretation and understanding.

**Figure 4.10: Land-Use Thematic Map & NDVI Image of MMNR in the year 1985**

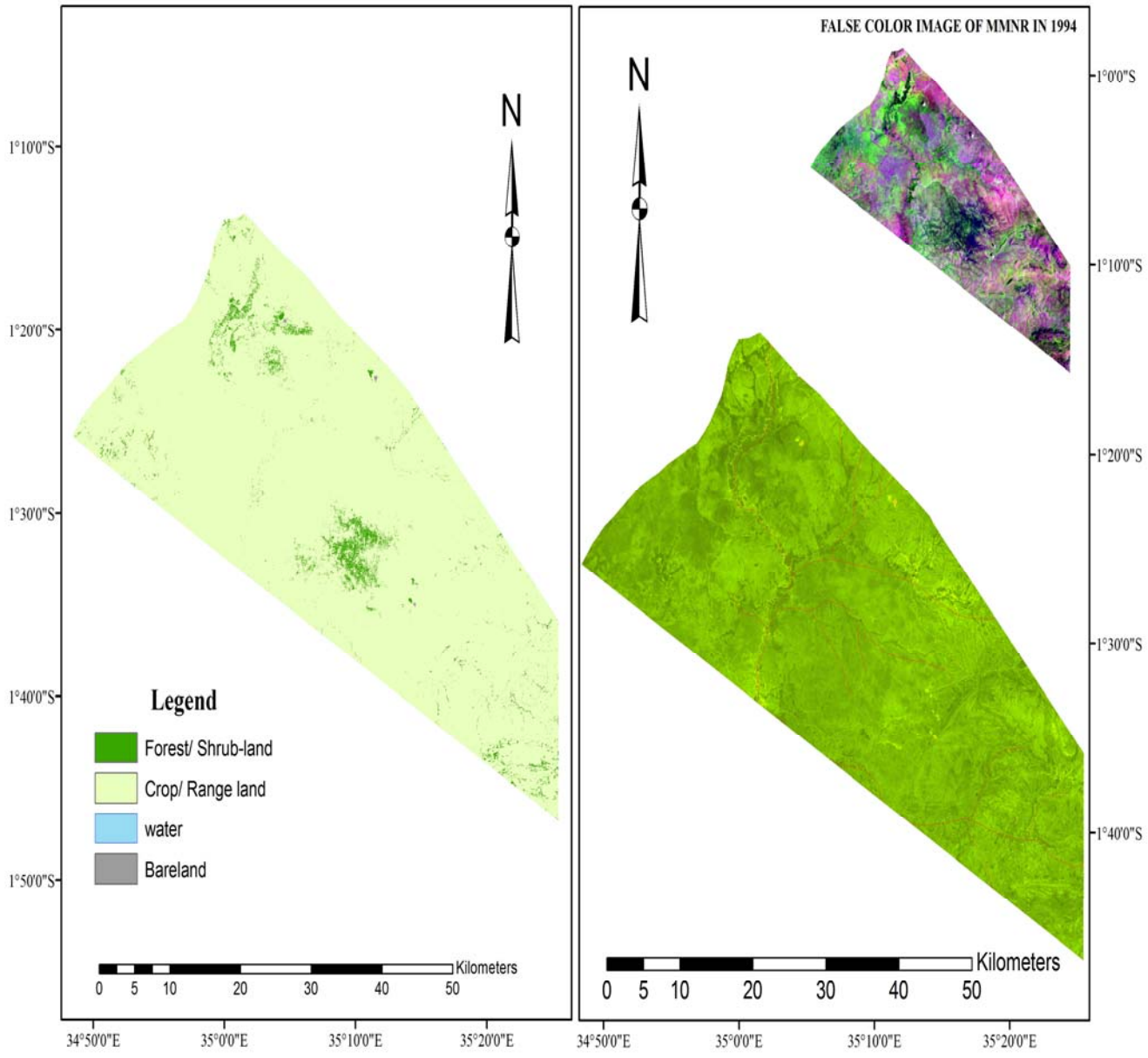



Source: GloVis, 2012

NDVI image of 1994 indicates improved vegetation cover (health and intensity) from 1984. Decreased vegetation cover is an indicator of ecosystem's health deprivation as a result of a string of factors some of which could be related to tourism and its related

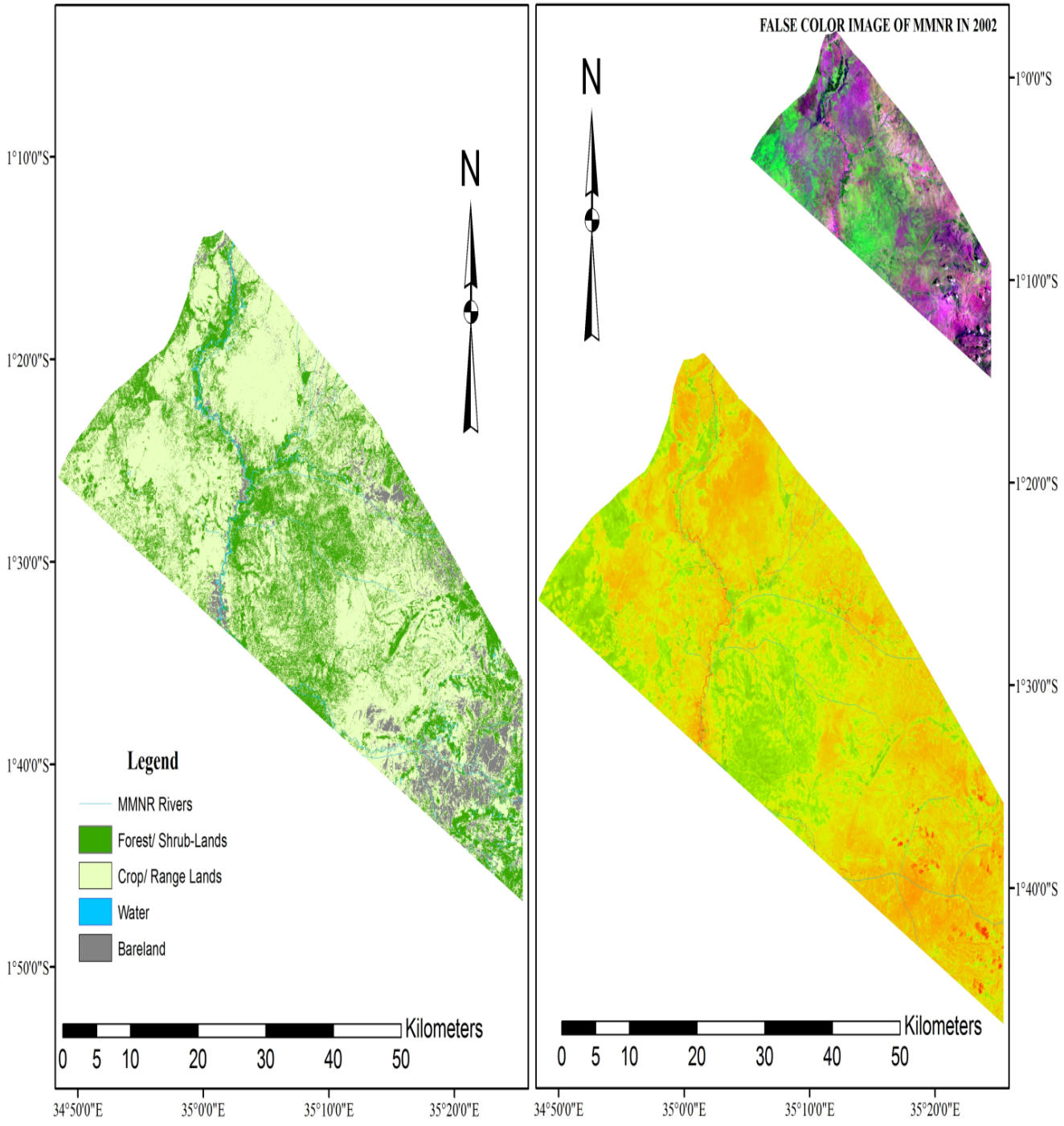
activities. From table 4.4 and figures 4.9-4.13, it can be seen that there was a general decrease in forest/shrub land cover between 1985 and 2011 from 312.03km$^2$ to 192.34km$^2$ which is 7.92% change. The findings also show that cropland/rangeland increased in acreage within the same time period from 940.2km$^2$ to 1214.33km$^2$ which is 18.15 % change. This presents a declining ecosystem health as more land within the MMNR is being taken up by infrastructural development mainly for wildlife based tourism facilities and the land surrounding the protected area is also rapidly coming under crop. A $\chi^2$ test indicates that this change is significant ($\chi^2$= 17.214, df= 3, p= 0.013). The hypothesis 'there has been an environmental status change in Maasai Mara over the last four decades' is therefore accepted. The result also show a reduction in bare land from 254.31km$^2$ to 99.85km$^2$ which may have been taken up by cropland. It is therefore evident that since the gazettement of MMNR in 1974, pressure on natural resources within the 1510 Km$^2$ land has gradually but steadily increased thus causing a decrease in forested areas. While it is evident that other uses like pastoral and agricultural demand on land exerts eminent pressure on the natural resources, wildlife based tourism may also be contributing to the vegetation cover change realized.

**Figure 4.11: Land-Use Thematic Map & NDVI Image of MMNR in the year 1994**



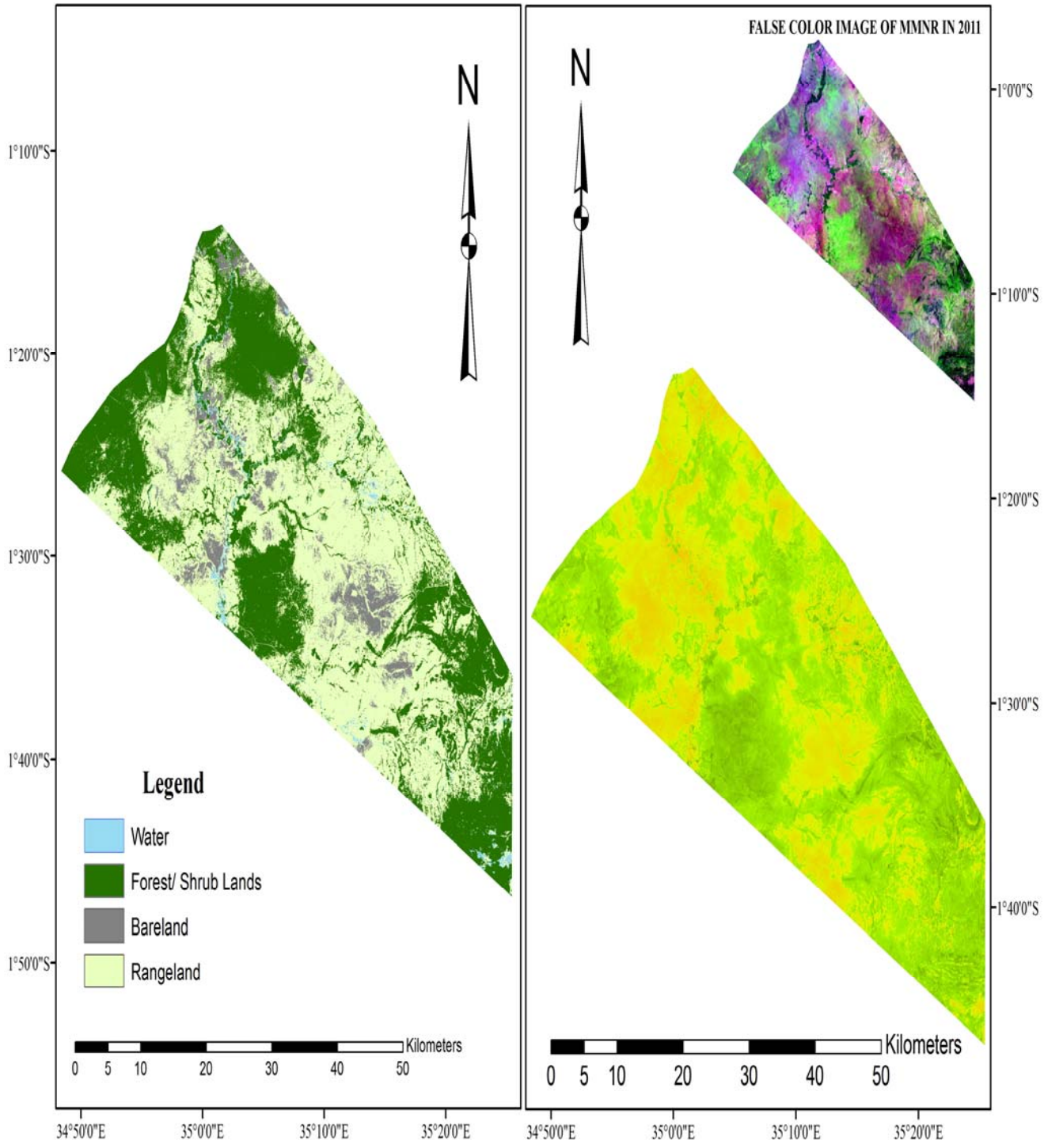

Source: GloVis 2012

**Figure 4.12: Land-Use Thematic Map & NDVI Image of MMNR in the year 2002**




Source: GloVis 2012

**Figure 4.13: Land-Use Thematic Map & NDVI Image of MMNR in the year 2011**




Source: GloVis, 2012

The Table 4.4 summarizes the inter-data variations in land-use/ land-cover (LULC) changes between 1974 and 2011. The data in table 4.4 indicates that the basin's LULC phenomena have substantially changed between 1974 and 2011. Generally, water resource availability as depicted through the aerial extent of water distribution indicates that water vulnerability has decreased in the MMNR within the study period, a finding that contradicts Falkenmark (1989) who indicates that the MMNR water vulnerability is on the increase. This can be explained by the fact that rivers have become wider due to erosion but shallower. Swamps have also enlarged in area but shallow due to deposition of silt from surface run off. Forest/ shrub lands in the MMNR have greatly decreased in size due to a drastic increase in range lands and crop lands. As the environmental balance become more delicate, the impacts of wildlife based tourism may become more pronounced and may result in a ripple effect where in the long run tourism will be affected. From Table 4.4, range lands constitute the most predominant LULC proportion in the reserve. Range lands generally are areas that on average receive below average rainfall of less than 750 mm per annum.

This study has established that expanding commercial farming, tourism and other human activities on land within and adjacent to the Maasai national reserve is threatening the sustainable coexistence of the region's pastoral people with the wildlife populations. Available literature supports the findings of this study and attributes the habitat loss and wildlife population decline in Maasai Mara to human population growth and increased demand on cultivation land (Omondi, 1995; Homewood *et al*., 2001). The general patterns of land use/cover for 1985, 1994, 2002 and 2011 are presented in Figure 4.10-4.12. Farmland, grassland, shrubland and forestland were the dominant land use/cover classes. Computed percentages of land use/cover classes show that in 1986, farmland, grassland, shrubland and forest areas occupied 1, 19, 11, and 69 per cent respectively (Table 4.4). According to Kamusoko *et al*., 2007), significant spatial expansion in agriculture and the rapid decrease in forest cover within and close to Maasai Mara National Reserve were observed in the 1986 and 2007 land use/cover maps that were used for their study. Their study indicates that the area under agriculture increased from

1% to 12% while forested areas reduced from 11% to 9 % within the period under study (i. e. between 1986 and 2007). Their analysis shows that significant expansion of farmland, extending to over 100,000 ha, took place in areas previously under grasslands. The expanding agricultural farms and deforestation to create room for mechanized farming and tourism businesses were noted to be serious and continuing problems in Maasai Mara (ibid). This suggests that the authorities have not done enough to arrest destruction of the MMNR ecosystem, which is actually worsening by the day.

### 4.3.2: MMNR's Precipitation Distribution since 1973-1999

MMNR falls within the greater Maasai Mara Basin; Table 4.5 below provides a synthesized aggregate summary of the MMNR both on monthly and annual rainfall from 1973 to 1999. Most of the weather stations ceased operation in the late 1990s. Precipitation data is presented in millimeter (mm) and is based on aggregation from five different weather stations. This data was obtained chiefly from the Kenya Meteorological Department (KMD) operated rain gauging stations.

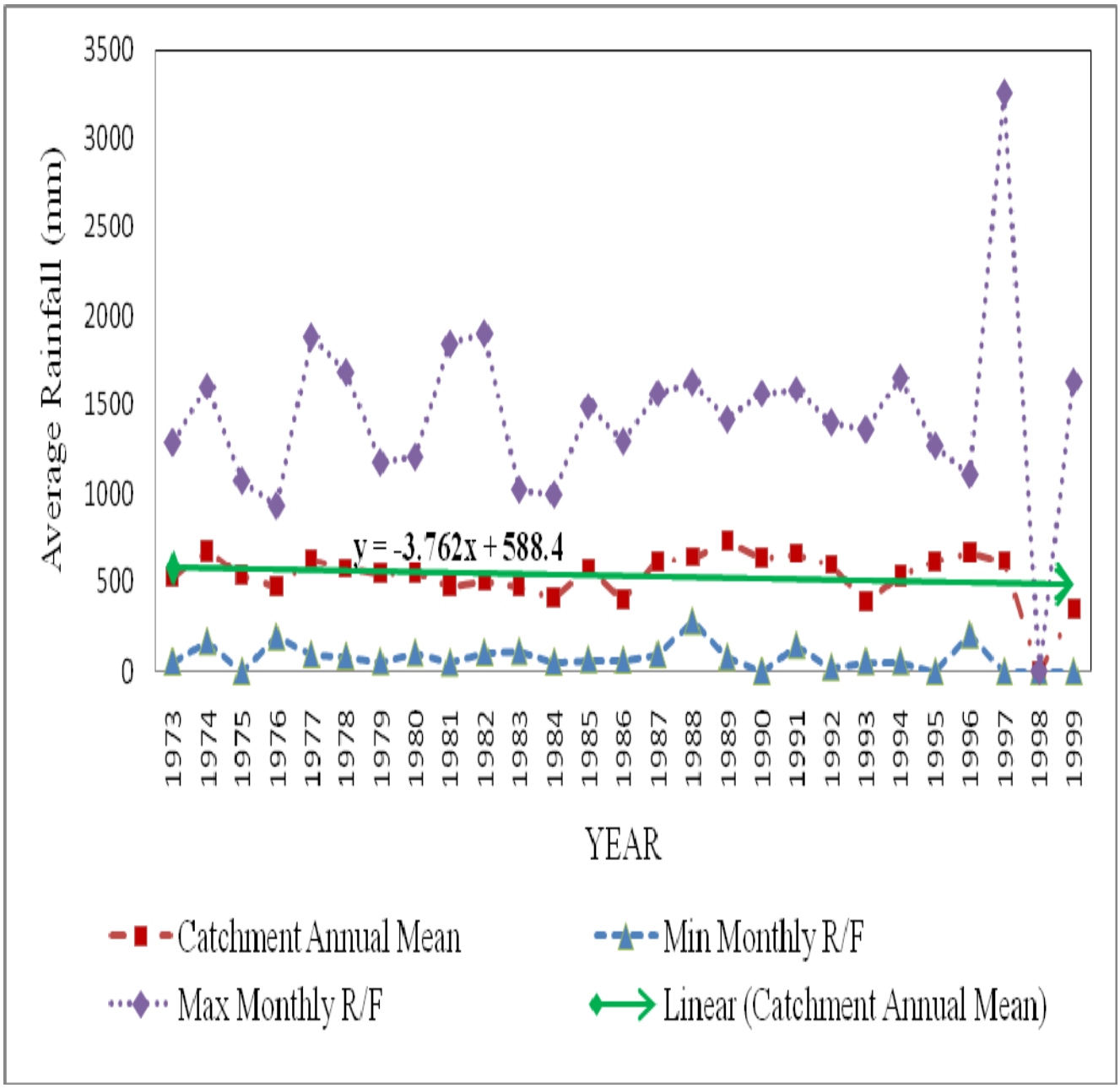
The precipitation as indicated in table 4.5 was used to determine precipitation change for MMNR. The precipitation trend's linear equation obtained is $y = -3.762x + 588.4$ (figure 4.14). This indicates that the basin's annual precipitation continues to decline at the rate of about 3.8 mm, meaning after ten years the MMNR's precipitation would have declined by about 38 mm. Precipitation is a primary factor affecting the distribution and healthiness of vegetation in MMNR and its decline is likely to complicate impacts on vegetation cover change. Previous research by (IPCC, 2001) projects that the land/ ocean - atmosphere system will result in the increase of the global aggregate surface temperature by a range of $1.8^0$C and $5.4^0$C by 2100.

**Table 4.5: Summary of MMNR Precipitation data from 1973 to 1993**

| YEAR | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Mean annual (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1973 | 1285 | 285 | 66 | 539 | 585 | 633 | 54 | 250 | 1132 | 314 | 547 | 623 | 526.04 |
| 1974 | 441 | 439 | 1298 | 1604 | 392 | 931 | 1484 | 189 | 650 | 168 | 230 | 326 | 679.23 |
| 1975 | 508 | 349 | 1072 | 720 | 846 | 332 | 941 | 241 | 837 | 263 | 1 | 326 | 537.92 |
| 1976 | 305 | 507 | 303 | 530 | 378 | 496 | 490 | 550 | 361 | 194 | 933 | 629 | 472.85 |
| 1977 | 998 | 734 | 297 | 1885 | 1102 | 209 | 456 | 188 | 96 | 291 | 795 | 573 | 635.25 |
| 1978 | 724 | 1018 | 1687 | 616 | 297 | 226 | 87 | 419 | 432 | 95 | 155 | 1225 | 581.56 |
| 1979 | 713 | 1174 | 706 | 1166 | 914 | 590 | 269 | 280 | 65 | 56 | 288 | 346 | 547 |
| 1980 | 1049 | 280 | 1125 | 1063 | 1204 | 295 | 143 | 104 | 125 | 284 | 565 | 422 | 554.71 |
| 1981 | 191 | 635 | 1846 | 1396 | 486 | 84 | 194 | 118 | 157 | 50 | 92 | 501 | 479.1 |
| 1982 | 225 | 424 | 344 | 1170 | 195 | 162 | 107 | 125 | 613 | 193 | 1903 | 635 | 507.85 |
| 1983 | 383 | 686 | 1023 | 586 | 113 | 375 | 211 | 273 | 305 | 260 | 601 | 842 | 471.33 |
| 1984 | 632 | 191 | 145 | 995 | 54 | 123 | 463 | 432 | 118 | 202 | 570 | 979 | 408.52 |
| 1985 | 68 | 1061 | 996 | 1490 | 375 | 615 | 267 | 70 | 249 | 179 | 1338 | 261 | 580.56 |
| 1986 | 470 | 476 | 531 | 713 | 180 | 250 | 164 | 166 | 64 | 180 | 319 | 1292 | 400.35 |
| 1987 | 1565 | 649 | 709 | 970 | 834 | 887 | 285 | 96 | 278 | 111 | 859 | 157 | 616.5 |
| 1988 | 841 | 282 | 1276 | 1631 | 846 | 307 | 310 | 498 | 413 | 286 | 392 | 649 | 644.08 |
| 1989 | 1330 | 705 | 1414 | 1239 | 1144 | 342 | 348 | 580 | 385 | 82 | 210 | 1068 | 737.1 |
| 1990 | 726 | 1310 | 1564 | 1126 | 1290 | 142 | 242 | 694 | 300 | 0 | 0 | 274 | 639 |
| 1991 | 604 | 442 | 946 | 546 | 1586 | 1075 | 148 | 312 | 186 | 947 | 274 | 890 | 663 |
| 1992 | 171 | 1144 | 794 | 1398 | 571 | 861 | 646 | 25 | 319 | 622 | 444 | 245 | 603.25 |
| 1993 | 1358 | 1330 | 562 | 171 | 293 | 445 | 93 | 117 | 103 | 57 | 71 | 85 | 390.39 |
| 1994 | 791 | 359 | 865 | 494 | 666 | 456 | 179 | 127 | 57 | 251 | 1656 | 489 | 532.25 |
| 1995 | 703 | 1267 | 616 | 776 | 1154 | 857 | 246 | 0 | 409 | 383 | 288 | 713 | 617.42 |
| 1996 | 903 | 1106 | 1069 | 785 | 207 | 357 | 542 | 642 | 904 | 518 | 466 | 543 | 669.79 |
| 1997 | 448 | 0 | 680 | 3256 | 1538 | 402 | 164 | 384 | 0 | 574 | 0 | 0 | 620.5 |
| 1998 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1999 | 506 | 545 | 1634 | 432 | 60 | 0 | 0 | 273 | 0 | 261 | 498 | 0 | 350.75 |

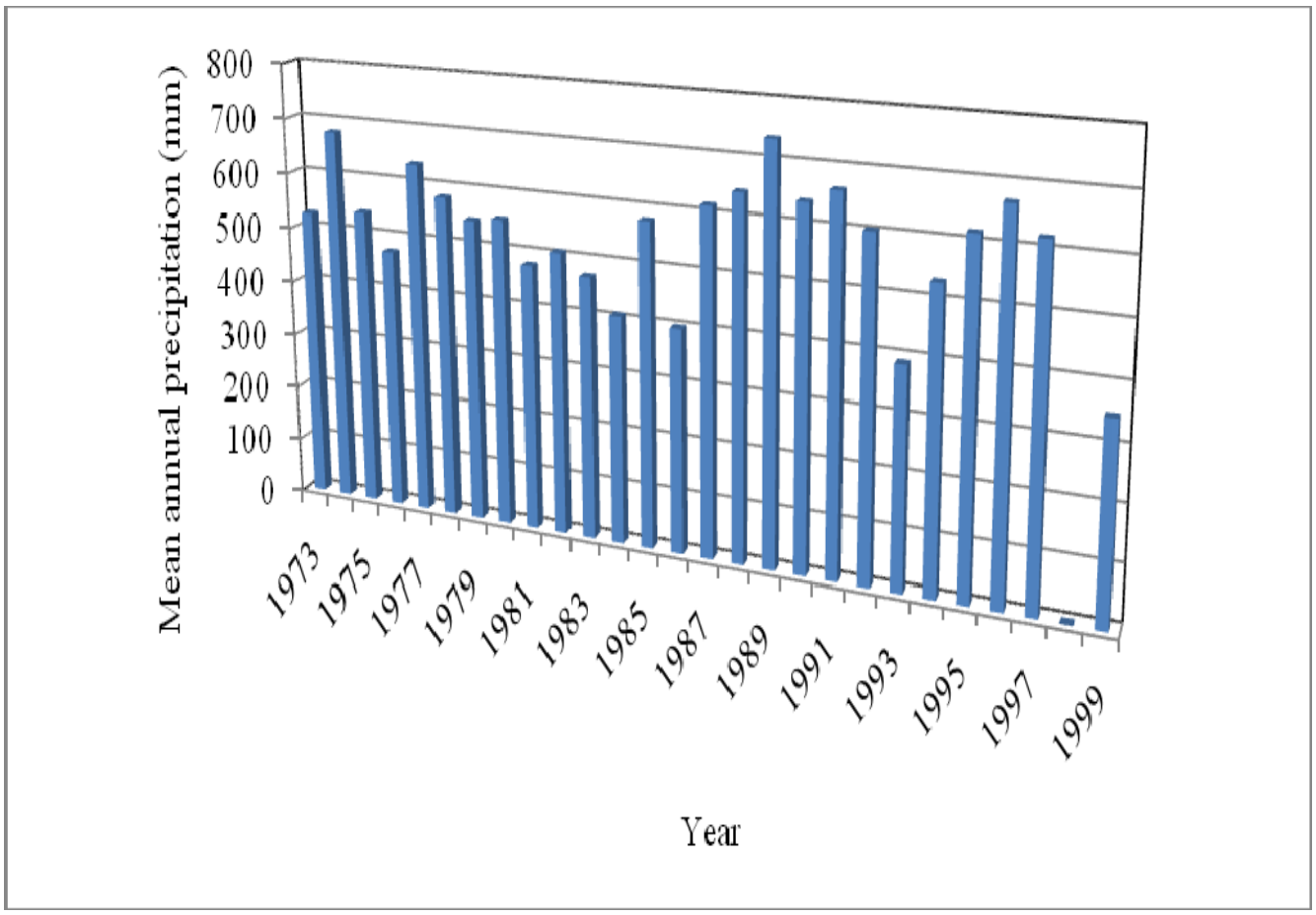
(Source: KMD, 2012)

**Figure: 4.14 Variability of the MMNR Precipitation**




(Source: KMD, 2012)

**Figure 4.15: MMNR annual rainfall distribution between 1973 and 1999**



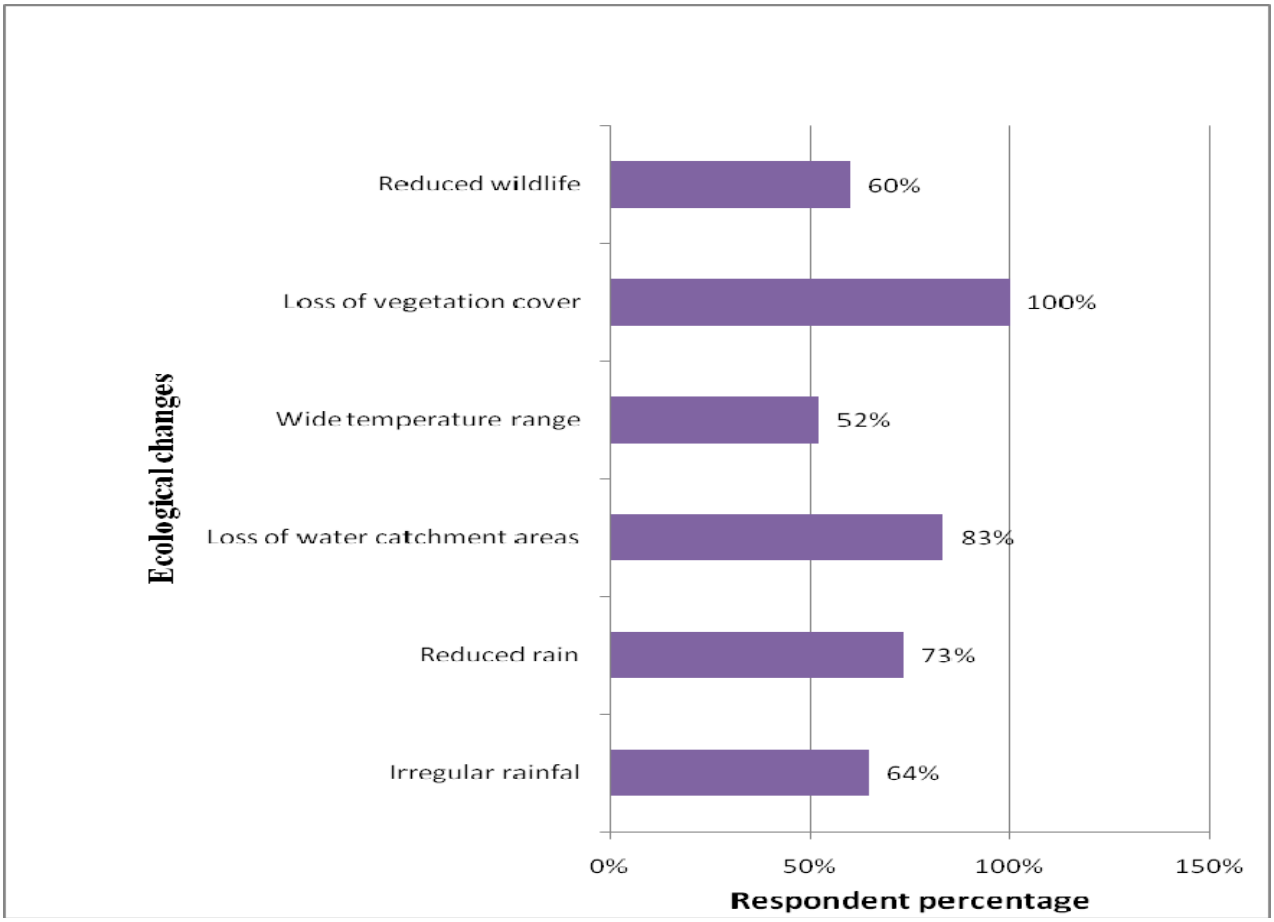

(Source: KMD, 2012)

MMNR's annual rainfall range is ±1021.17 mm which indicates that the average rainfall received in the area is highly variable, sporadic and sometime unpredictable in nature. Since 1989 when Falkenmark first introduced the concept of water stress indicator, many other indicators have since been introduced. MMNR precipitation decrease as calculated over duration of about three decades (1973 to 1999). A decline of 3.9 mm annually is significantly high and a clear indicator that the water resources in the basin are increasingly becoming more vulnerable. This trend corresponds to the US Geological Survey Report (2010), in which it was argued that rains received between March and June in Kenya had declined by more than 100 mm from 1970s. This is linked to the warming of the Indian Ocean.

### 4.3.3 Ecological changes noticed in MMNR can be attributed to WBT

The study established that over the years there has been continuous reduction of vegetation cover (100%), loss of water catchment areas (83%), reduced rainfall (73%) irregular rainfall (64%) and wide temperature range (52%) which in turn together with other factors have caused a reduction in wildlife (60%) (figure 4.16). This finding shows an admission by the local community that all is not well and something needs to urgently done to reverse the trends. Findings from the guided interview supported these views as a number of them noted that their livelihood depended strongly on the ecosystem services. The peoples' feelings Perceptions) adds weight to quantitative data which indicates that MMNR biodiversity is at risk.

**Figure: 4.16 Ecological Changes attributed to WBT in MMNR**



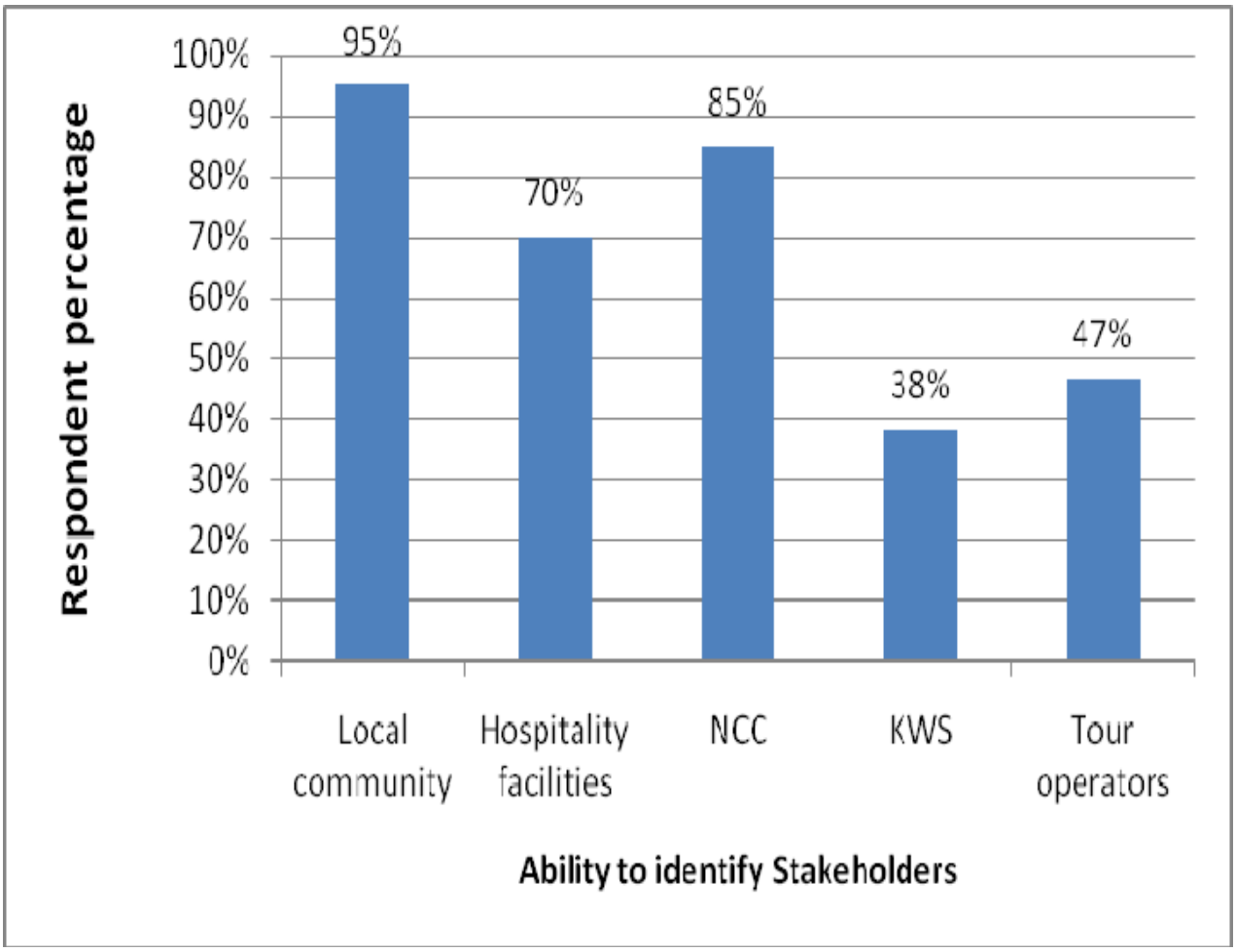

Source: Field Survey 2012

## 4.5 Roles of stakeholders in mitigating and controlling negative impacts of wildlife based tourism in Maasai Mara National Reserve

### 4.5.1 The stakeholders of WBT in MMNR

There are many stakeholders in WBT in MMNR according to the respondents who participated in this study. The results as summarized in figure 4.18 indicate that 95% of respondents identified local community as a key stakeholder, 85% identified NCC, 70% indicated hospitality industry players, and 47% identified tour operators while 38% identified KWS as stakeholders of WBT in MMNR. This finding suggests that knowledge about who the tourism stakeholders are is high since various participants were able identify them. This is important for policy formulation, implementation and support of conservation activities.

**Figure 4.18: Ability to identify stakeholders**




Source: Field Survey 2012

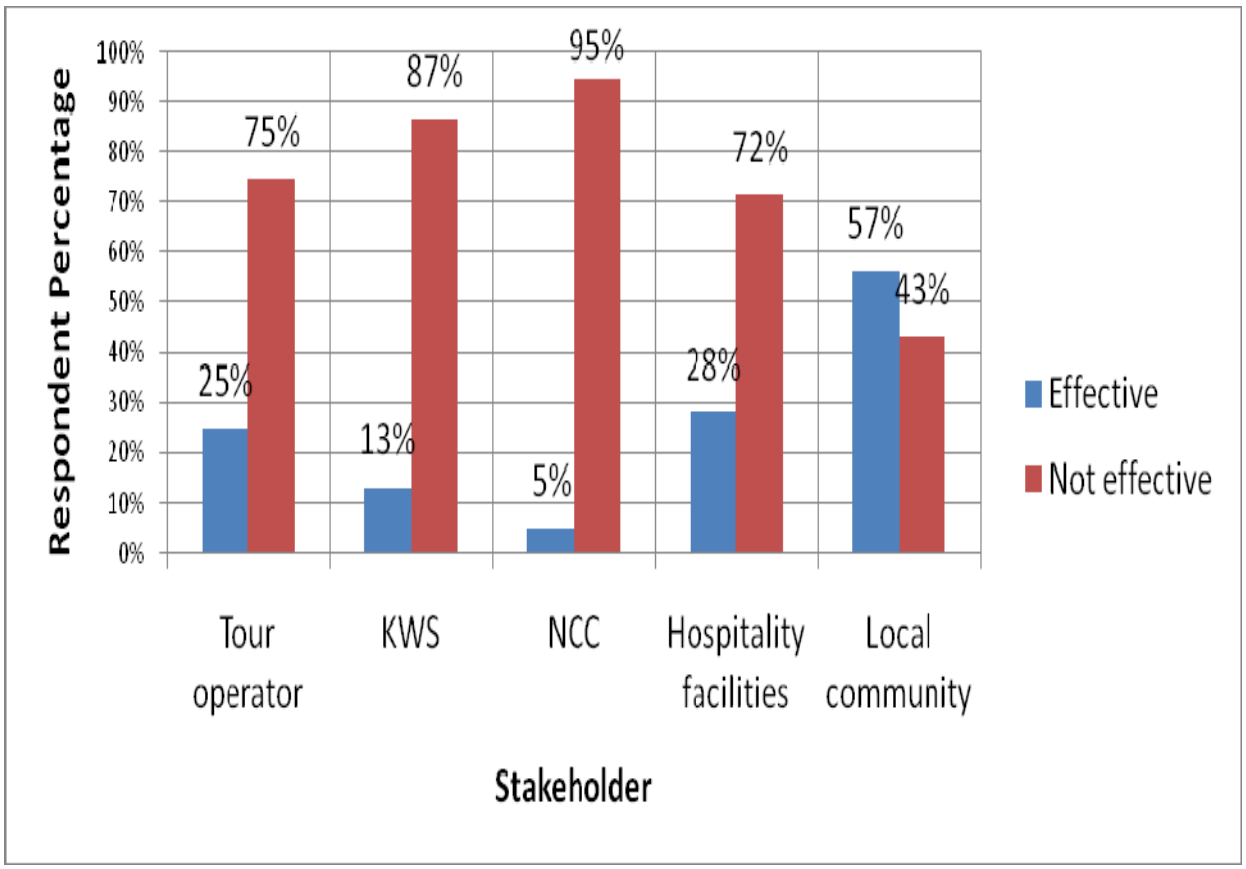
### 4.5.2 Effectiveness of stakeholders in mitigating and controlling the negative effects of WBT

This study hopped to establish the effectiveness of roles played by various stakeholders in mitigating and controlling the negative impacts of WBT in MMNR. Figure 4.19 shows summary of findings. The results show that apart from the local community that was regarded effective by 57% of the respondents, hospitality (28%) and tour operators (25%) the rest were regarded technically ineffective. This show an existence of bad blood between government conservation agents and those stakeholders involved in the study, hence the underestimation of the roles of key players like the KWS. There is increasing

recognition that a key element of natural resource management is the understanding and incorporation of the stakeholders' interest in conservation matters. For example Hess & King (2002) and Yamada *et al*. (2003) noted conservation planners increasingly make use of stakeholders as sources of expert opinion and to supplement other data collection efforts because systematic, scientific data on the dynamic and diverse interactions between humans and wildlife are often lacking.

An increasing research work suggests that asking stakeholders to guide wildlife conservation can build trust, foster communication, and hopefully promote collaboration among other stakeholders in designing interventions or implementing monitoring strategies (Heberlein, 2004; Grossberg, Treves, & Naughton-Treves, 2003; Jackson *et al*., 2001). Conservation projects usually require long-term relationships with multiple stakeholders (Bille & Mermet, 2002). Armed with stakeholders' perceptions of human activities believed to threaten biodiversity and or sustainability, wildlife conservationists can identify meaningful overlap among stakeholder interests, while promoting collective actions to address these threats. Building consensus to protect wildlife is particularly challenging when human wildlife conflicts occur or when users are unaware of their own impacts (Naughton-Treves, Grossberg, & Treves, 2003).

**Figure 4.19: Effectiveness of Stakeholders in mitigating and controlling negative effects of WBT.**




Source: Field Survey 2012

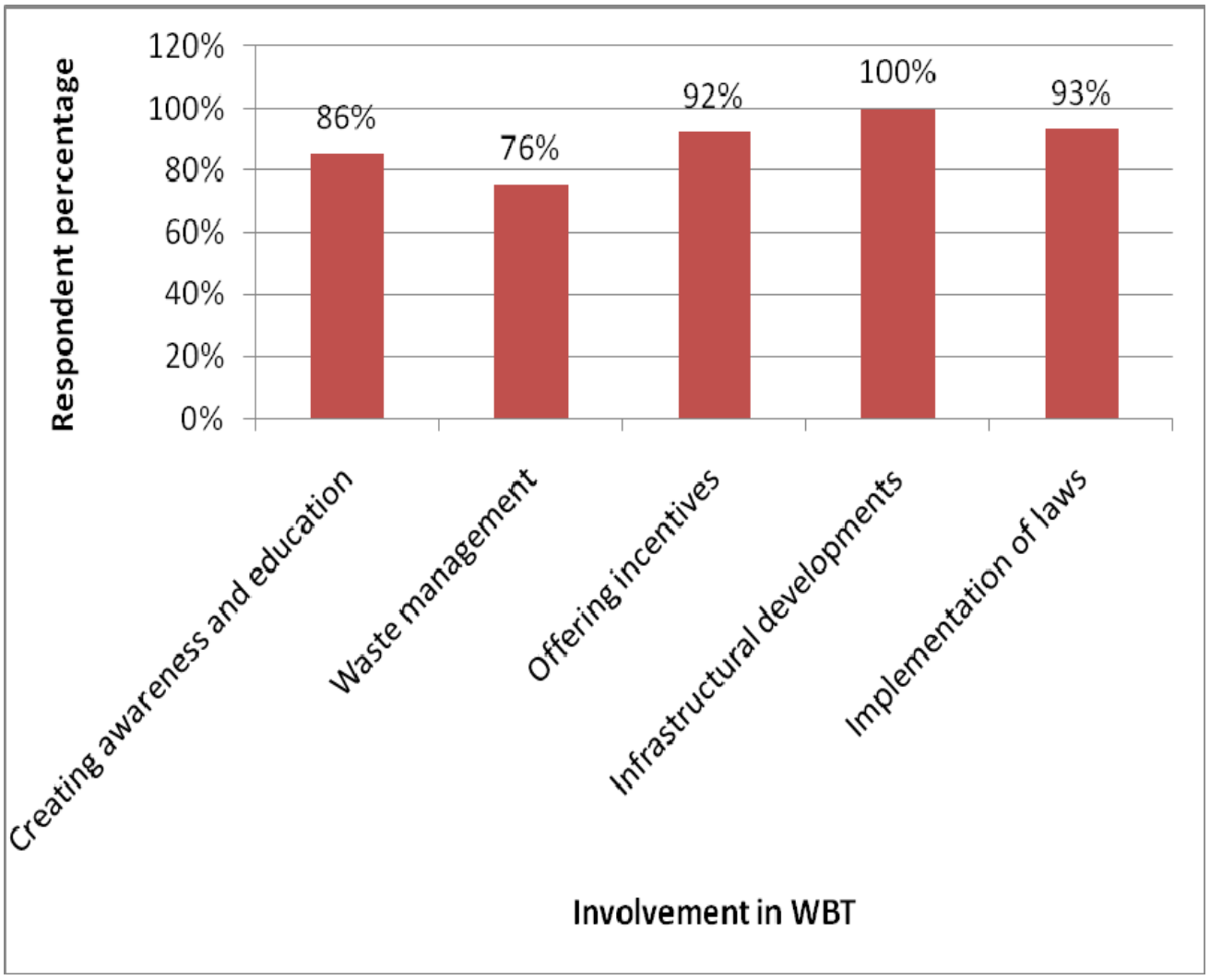
### 4.5.3 Ways to foster sustainable WBT in MMNR

This study also thought it necessary to seek the opinion of respondents about ways that stakeholders can engage in to enhance sustainable tourism development. The result show 100% of the respondents thought infrastructure development will kindle the support of key stakeholders to support conservation activities, 93% cited implementation of laws, 92% indentified offering incentives in return for conservation activities, 86% of the respondents thought creating awareness and education can go a long way in enhancing sustainability into the WBT industry while 76% indentified proper waste management (figure 4.20).

A growing body of literature points to fact that if people are not adequately involved in issues to do with nature conservation they become hostile to wildlife conservation initiatives and aggressive towards staff of protected areas. Heberlein (2004) and Grossberg, Treves, & Naughton-Treves (2003) in their review on human wildlife conflicts (HWC) noticed that HWC escalates when local people feel that the needs or values of wildlife are given priority over their own needs, or when local institutions and people are inadequately empowered to deal with the conflict. If protected area authorities fail to address the needs of the local people or to work with them to address such conflict adequately, the conflict intensifies, becoming not only conflict between humans and wildlife, but also between humans about wildlife (Jackson *et al*., 2001). It is therefore possible that wildlife conservation initiatives suffer when the economic and social well-being of local people is impaired, when locals support for conservation declines and when conservation and development efforts meant to offset more general "costs" of living near a protected area is impeded.

Wildlife agencies, therefore, now days face the unenviable task of balancing diverse and often conflicting citizen interests in wildlife while attempting to integrate such interests with sound biological data (Brooks *et al*., 2006). In response to this challenge, agencies have extended their use of human dimensions research and have experimented with numerous techniques to involve stakeholders in ways that simultaneously integrate biological and socioeconomic information into wildlife management decision for sustainable development (Ibid).

**Figure 4.20: Ways of sustainable involvement in WBT**




Source: Field Survey 2012

### 4.5.4 Stakeholders' perceived negative impact level and their contribution towards sustainable WBT in MMNR

The negative impacts of each stakeholder differ with the nature of their activity. This prompted the researcher to assess the existing knowledge about the level of negative impact by stakeholder activity on the conservancy. The participants were asked to list the stakeholder that they consider as having direct and indirect threats to biodiversity or natural resources upon which tourism depends. The result show that 37% of the

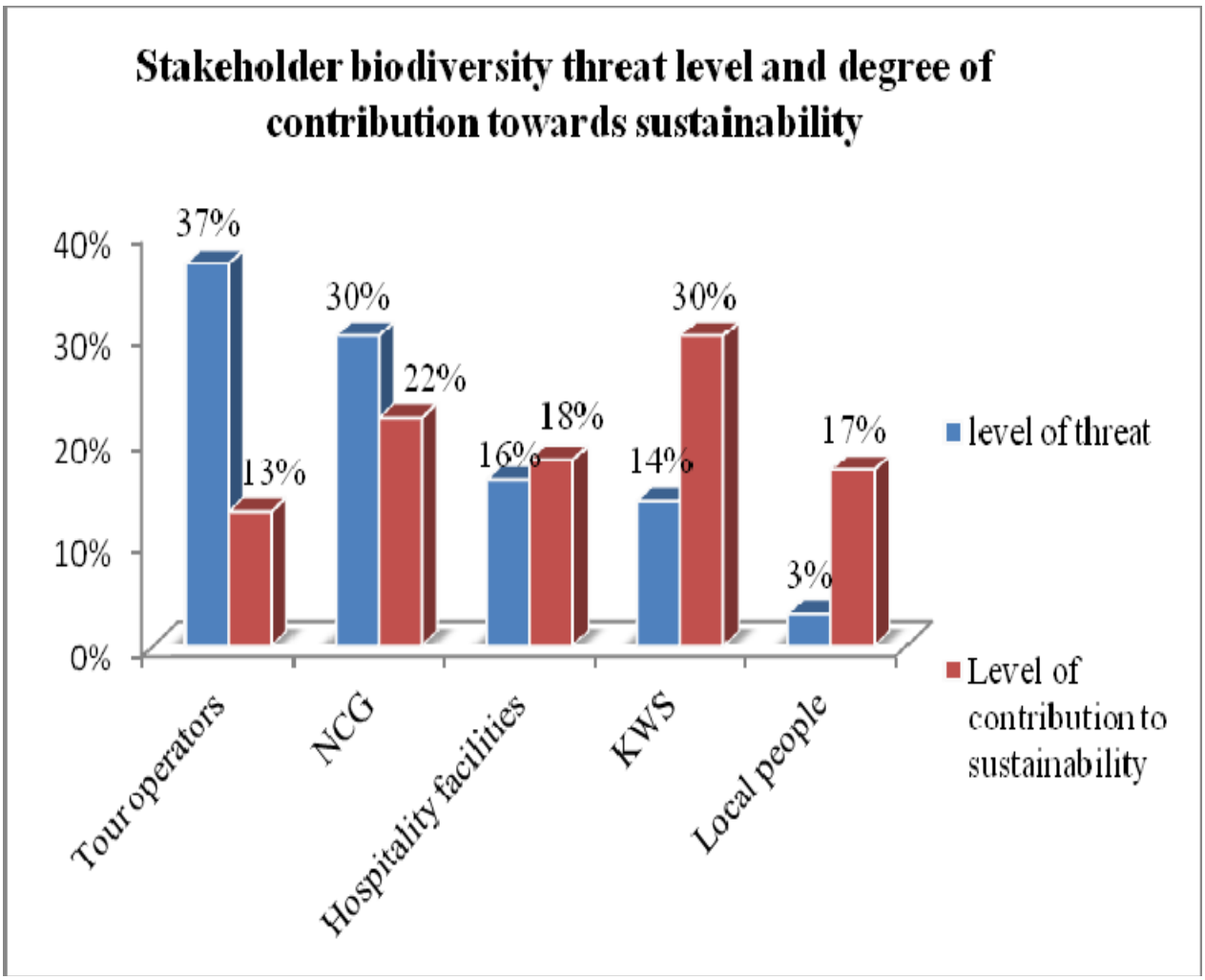
respondents felt that tour operators are more threatening to the environment and biodiversity, followed by NCC (30%), hospitality facilities (16%), KWS (14%) and local community (3%) (figure 4.21). The respondents argued that tour van drivers are often involved in off-road driving to get a closer look of the game especially the big five thereby disrupting feeding, mating and resting of the animals and destruction of vegetation by their trampling. Their activities are therefore considered more threatening to biodiversity. The results of the guided interview also indicate that many of the activities of tour operators, NCC and hospitality facilities were regarded to have direct biodiversity threats while local communities' threats on biodiversity is regarded as indirect. The KWS has an equal mixture of both. The study established that to achieve sustainability in the WBT stakeholders must be involved fully; they should put an effort into conservation that is commensurate with the roles/threats and level of their responsibility. The result indicate that KWS took the first place play greater role in the conservation (30%), followed by NCC (22%) and lastly local people (17%) (figure 4.21). The result attempts to illustrate relative responsibility of each stakeholder in bringing about sustainability into WBT in MMNR. As illustrated in the previous subsection, this result suggests that all stakeholders are deemed integral part of bringing about sustainability into natural resource conservation.

Brooks *et al*. (2006) indicate that direct threats are those human activities that directly, physically diminish biodiversity or use resources unsustainably: habitat loss - converting one habitat type to another; species depletion - removing wild plants and animals; pollution - biochemical, physical, or thermal changes; and introduction of non-native plants, animals, or microbes – species that supplant local species or diminish their health.

Indirect threats are the attitudes and responses of users, managers, and policy-makers that facilitate or promote any given damaging activity. Indirect threats are classified into three categories: users' lack awareness of the damage caused by their own activities, lack of incentives for conservation or sustainable use, or lack alternatives to a damaging activity; managers' lack of information, capacity, or incentives to intervene effectively, to detect or monitor threats, or to communicate rules to users; and policy-makers' lack awareness,

resources, or incentives to provide adequate laws or support (financial or judicial) for law enforcement (Ibid).

**Figure: 4.21 Stakeholder's perceived biodiversity threat level and degree of mitigation and control of impacts of WBT.**




Source: Field Survey 2012

This result is, therefore, in agreement with other studies that have been done. For example, literature indicates that conservation projects usually require long-term relationships with multiple stakeholders (Bangs e*t al.*, 1998; Bille & Mermet, 2002; Jackson *et al*., 2001). This study provided an opportunity for the stakeholders to identify the level of threat their activity exposes biodiversity to and seek insight into how much effort (in relation to others) each should put into biodiversity conservation to reverse

destructive human activities. Similar studies by Bille & Mermet (2002), Doolittle (2003), Heberlein (2004) stakeholder participatory assessment are useful in any development and environmental conservation.

In order to test the hypothesis, "different stakeholders play unique roles towards the mitigation and control of impacts of wildlife based tourism in Maasai Mara National Reserve", respondents were asked, on a scale of 1-5, to rate the extent to which different stakeholders play unique roles (where 1= high extent; 2=moderate extent; 3=neutral; 4=low extent; 5=very low extent) (Table 4.6). The Table reveals that the respondents indicate high extent/ moderate extent (mean 1.37 ± 0.587) meaning that stakeholders of MMNR play unique roles. Therefore, the hypothesis that different stakeholders play unique roles towards the mitigation and control of impacts of wildlife based tourism in Maasai Mara National Reserve is accepted.

**Table 4.6: Influence of Stakeholders on WBT in MMNR**

| **Stakeholders roles (N= 80)** | **Likert Scale (1= to a agree extent, 5= to a small extent) %** | | | | | **Mean** | **STD DEV** |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | | |
| **Community members** | 43.4 | 34.6 | 22.0 | 0 | 0 | 2.31 | 0.516 |
| **Tour operators** | 47.2 | 33.4 | 18.4 | 1.0 | 0 | 2.14 | 0.562 |
| **Tourism facility managers** | 51.7 | 35.5 | 9.8 | 3.0 | 0 | 1.37 | 0.587 |
| **Tourists** | 37.3 | 42.1 | 16.8 | 2.8 | 1.0 | 2.64 | 0.862 |

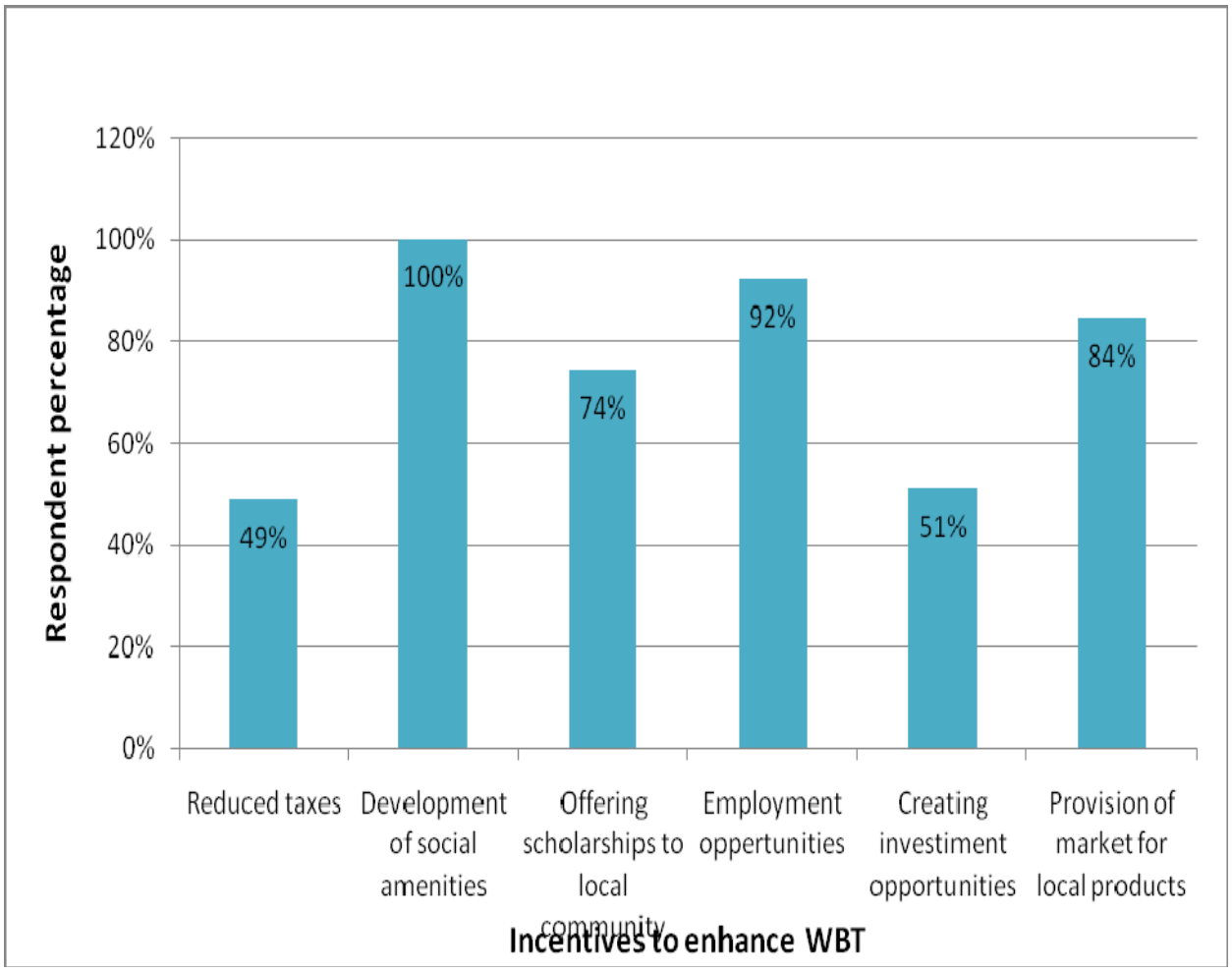
Source: (Survey data, 2012)

### 4.5.5 Stakeholder incentives for sustainable WBT development in MMNR

Offering incentives to stakeholders for in natural resource management (NRM) participation has long been identified as a good vehicle for driving conservation progammes. For this reason the study wished to establish whether the management agencies have factored incentives into MMNR conservation programmes. To achieve this, participating respondents were asked to list the incentives offered to them to encourage their participation in wildlife sustainable utilization. Respondents listed numerous direct/indirect incentives enjoyed individually or as a group as summarized in figure 23. The result shows that 100% of the respondents cited development of social amenities, 92% of them pointed out availability of employment opportunities, 84% noted development of markets for local products, 74% mentioned scholarships for local deserving students, 51% of them mentioned investment opportunities while 49% of the respondents cited reduced taxes and fees on tourism facilities (Figure 4.22).

Stakeholder incentives are based on the interaction of economics and politics, and relate to both fundamental drivers and day-to-day politics (Fritz & Levy, 2014). Suich (2013) notes that as the provision of incentives is generally considered key to encouraging and maintaining participation in NRM, the inability to deliver appropriate benefits that have a sufficient impact at the household level is of concern to policy makers and programme designers. However, it's important to note that stakeholders and incentives issues are situational, varied and dynamic in nature and so must be regularly assessed for policy formulation and to adapt them to changing times. This fact is underscored by Fritz & Levy (2014) who noted that natural resource booms frequently create new economic interests and power holders, and understanding ownership patterns in the economy can help identify key stakeholders and interest structures. These ownership patterns can fluctuate and at the same time shocks can rapidly change incentives (Ibid). With that in mind it is likely that there is no common set of key stakeholders but rather in different contexts and at different times certain stakeholders may well have the right influence to tip the balance in a situation.

**Figure 4.22: Incentives that can enhance WBT in MMNR**




Source: Field Survey 2012

There have been numerous papers written describing the range of incentives available for NRM (James, 1997; Robinson and Ryan, 2002; Agtrans Research, 2003). In a study of CBNRM following the devolution of property rights over wildlife to communities in southern Africa, Suich; 2013 identifies a number of incentives but highlights the importance of them being widely known and sufficiently effective. The key incentives for the local community are the potential jobs, income from hunting, trade and entertainment activities. Barma *et al.* (2012) noted that developing countries often use generous tax incentives to compensate investors for high levels of risk, and to attract financial resources to develop extractive industries within the natural resource. It has also been

noted that rapidly rising mineral revenues raise the expectations of citizens in terms of the economic benefits they would receive (Fritz, 2014). These literatures supports our finding and further elucidates the fact that the context of stakeholder incentives must be understood as enabling factor for sustainable natural resource development. Often many of the factors involved are themselves the outcomes of current and former stakeholder incentives.

### 4.5.6 Challenges of mitigating and controlling negative impacts of WBT in MMNR

There are many challenges facing mitigation and control of negative impacts of WBT in MMNR. Some of the challenges identified by the survey include; failure to implement and enforce laws that are in place (78%), poor market segmentation (72%), competition for resources (70%), political interference (62%), poor collaboration and coordination amongst stakeholders (63%) and low surveillance capacity (48%) (Figure 4.23).

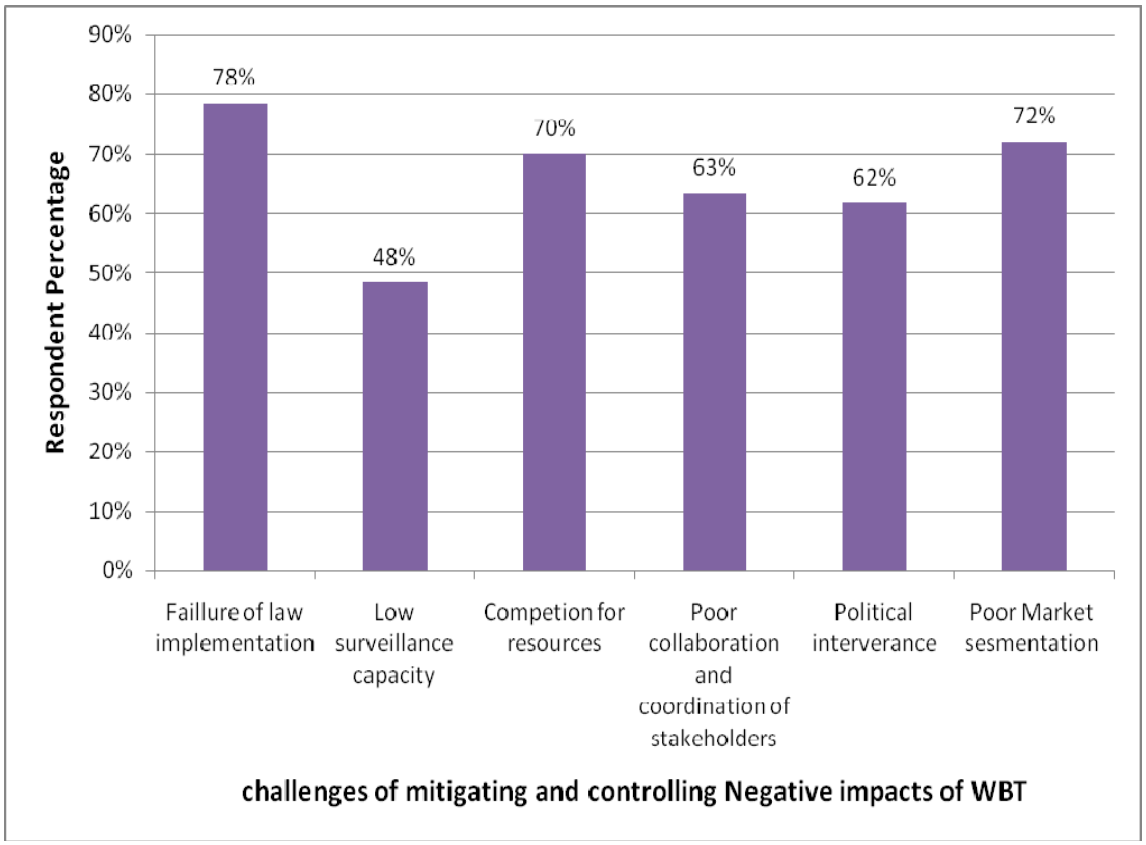
Stakeholder concept has been loaded in many instances as key to NRM its collaborations and coordination is vital for effective participation. Collaboration is regarded as a process through which groups with similar or different perspectives can exchange viewpoints and search for solutions that go beyond their own vision of what is possible (Matose, 2006). Literature shows that the indigenous population of Africa played an important role in managing and protecting natural resources through local institutions before the arrival of European colonialists (Fabricius, 2004; Matose, 2006). Through careful stakeholder interest analysis of the indigenous people, their participation in protecting and conserving the MMNR can be improved.

All the factors illustrated in figure 4.23, but more so failures to implement and enforce laws, political interference, low surveillance capacity are all interlinked and in turn linked to political set up and poverty level of the people. This view is made clear by Barma et al. (2012) and Mcloughlin (2013) who point out that natural resource extraction can yield ‘super-normal’ profits depending on the geographic conditions and the prevailing business climate, which can in turn generate incentives to avoid and discourage transparent oversight and investments in institutional capacity. The political elite are the direct recipient of resource revenue and face the challenge of how to allocate this revenue

between its own enrichment, activities that increase the elite's chances of retaining power, and investments that can increase the economy's capacity to produce non-resource income (Caselli & Cunningham, 2009). Politicians, or political elites can be incentivized by monetary profit and pursue their own enrichment but even where politicians look to achieve development objectives, they may struggle to pursue these goals because of the need to maintain the support of vested interests (Fritz & Levy, 2014).

For the foregoing the problems facing sustainable WBT is majorly political and the poverty level of the immediate community. Their interest must carefully be analyzed, sufficiently involved in resource utilization policy drafting and implementation, and well incentivized to get their solid support for conservation projects.

**Figure 4.23: Challenges of Mitigating and Controlling Negative Impacts of WBT in MMNR.**




Source: Field Survey 2012

# CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

## 5.0 Introduction

This chapter presents summary of the findings, makes conclusions and gives recommendations on the way towards sustainable WBT in MMNR.

## 5.1 Summary of findings

A total of 80 questionnaires were successfully completed by respondents which gave a questionnaire response rate of 80%. Of the 80 respondents, 51 were male and 29 were female.

The findings from the study indicate that 76% of the study respondents were very concerned about the future of WBT, 18% were moderately concerned while 5% were not concerned at all. The result further shows that 71% of the respondents were very concerned about the environment where tourism and the wildlife draws there living, 26% were moderately concerned while 3% of the respondents were not concerned. However, the result show that not all wildlife was viewed by tourists, high preference is given to the big five.

The result show that 92% of the respondents were of the opinion that tourism brings about development of tourism facilities (such as Hotels, Lodges, and Camp base), 90% indicated employment opportunities, 80% indicated development of infrastructures such as roads, electricity, and communication faculties, 47% indicated cultural interactions between the locals and the tourists while 40% indicated a ready market for local products. It was further shown that tourism benefits can be enhanced by increasing tourists' fees, education and awareness creation were cited as a necessary requirement at 67% and 61% respectively, rigorous marketing of WBT products and involvement of all stakeholders in decision making (44%), development of infrastructures like accessible roads, public airstrips (33%) and offering incentives like lowering tax for tour operators and hotels and

visa application waivers (31%). Infrastructure development was also mentioned as one of the factors that can enhance tourism earnings.

On negative impacts, the result show that 93% of the respondents cited human wildlife conflict is rampant in the region and is partly caused by WBT; construction of tourism facilities and other tourism related infrastructures including irresponsible tourists behavior like driving off the designated paths, feeding of wild animals, irresponsible waste disposal and wild fires caused by cigarette remains (87%), death and migration of some wildlife animals due to consumption of poisonous wastes that are left behind by tourists in the reserve and being scared (70%), destruction of wildlife habitat (53%) and disruption of wildlife's feeding and breeding patterns (41%). According to the study, corruption (100%), mushrooming of hospitality facilities have taken up land in and adjacent to MMNR (88%), failure to enforce government policies due to weak institutions (87%), land use change as more land is demanded for agricultural purposes (77%), poor planning and management of WBT (70%) and climate change effects (53%) were some of the causes of the negative impacts.

The study revealed that obstacles to sustainable wildlife development do exist and they include: insecurity (72%); underdeveloped infrastructure like roads, green hotels and lodges (72%); 68% of the inadequate education and awareness (68%); lack of political good will (68%); climate change (53%) and land use change (38%).

On the status change of MMNR, analysis of remotely sensed images of reserve from 1975 to 2011 reveal a general decrease in forest/shrub land cover from 312.03km$^2$ to 192.34km$^2$ which is 7.92% change for a period between 1985 and 2011 The findings also show that cropland/rangeland increased in acreage within the same time period from 940.2km$^2$ to 1214.33km$^2$ which is 18.15 % change. This presents a declining ecosystem health as more land within the MMNR is being taken up by infrastructural development mainly for wildlife based tourism facilities and the land surrounding the protected area is also rapidly coming under crop. A $\chi^2$ test indicates that this change is significant ($\chi^2$= 17.214, df= 3, p= 0.013). The result also show a reduction in bare land from 254.31km$^2$ to 99.85km$^2$ which may have been taken up by cropland. The analysis of rainfall data

from the meteorological station yielded precipitation trend's linear equation of y = -3.762x + 588.4 which indicates that the basin's annual precipitation continues to decline at the rate of about 3.8 mm thus complicating effects of conservation.

The stakeholders of MMNR were indicated as 95% of the respondents who were of the idea that it's the local community, 85% noted NCC, 70% indicated hospitality industry players, and 47% identified tour operators while 38% identified KWS. Each of these stakeholders plays a unique role in the utilization of the reserve because of the nature of their activities and therefore eventual input effort in conservation. The result show that 37% of the respondents felt that tour operators are more threatening to the environment and biodiversity, followed by NCC 30%, hospitality facilities 16%, KWS 14% and local community 3%. The respondents argued that tour van drivers are often involved in off-road driving to get a closer look of the game especially the big five thereby disrupting feeding, mating and resting of the animals and destruction of vegetation by their trampling. Their activities are therefore considered more threatening to the MMNR biodiversity.

The results of the guided interview also indicate that many of the activities of tour operators, NCC and hospitality facilities were regarded to have direct biodiversity threats while local communities' threats on biodiversity is regarded as indirect. The KWS has an equal mixture of direct and indirect impacts. The study established that to achieve sustainability in the WBT stakeholders must be involved fully; they should put an effort into conservation that is commensurate with the roles/threats and level of their responsibility. The result indicate that KWS took the first place, play greater role in the conservation (30%), followed by NCC (22%) and lastly local people (17%).

For the stakeholders to play their unique roles responsibly taking care not to harm the environment, they need to be sensitized. The result shows that 100% of the respondents cited development of social amenities, 92% of them pointed out availability of employment opportunities, 84% noted development of markets for local products, 74% mentioned scholarships for local deserving students, and 51% of them mentioned investment opportunities while 49% of the respondents cited reduced taxes and fees on

tourism facilities as incentives. Even with incentives, there is likely to be mitigation challenges as noted by the respondents who cited failure to implement and enforce laws that are in place (78%), poor market segmentation (72%), competition for resources between humans themselves and humans and wildlife (70%), political interference (62%), poor collaboration and coordination amongst stakeholders (63%) and low surveillance capacity of the institutions with responsibility (48%).

## 5.2 Conclusion

From the findings of this study it can be concluded that:

1) Wildlife based tourism in MMNR has both benefits and negative environmental impacts. The fact that this view is held by those who participated in the study is an admission that stakeholders are aware that tourism is beneficial to the community and those benefits can trickle down to improve their way of life. The challenges lie in managing the industry to generate the desired income while minimizing undesired negative impact on the ecosystem. The negative impacts are as a result of the stakeholder roles (activities), whose participation in the management will go a long way towards mitigating the negative outcomes.

2) The status of MMNR has tremendously changed; the forest/shrub land has decreased while cropland has increased especially around the protected area. The protected area forest cover has been taken up by tourism infrastructures like hotels and roads thus reducing the quality and amount of the very resource upon which tourism depends. This reduction in the vegetation cover is partly attributable to tourism activities.

3) Stakeholders do play unique roles in the mitigation of the negative impacts. The nature of their activities results in negative environmental outcomes, they should therefore put in an equivalent effort towards the mitigation and control measures of the impacts.

## 5.3 Recommendations

### 5.3.1 Policy Recommendations

The findings of this research could be used to improve tourism policy in a number of ways.

1) Encourage public and private joint investment projects in tourism through providing special facilities and preferential treatment for investors from the community self help groups and identifying international and regional financial institutions to support, finance and invest in tourism development.

2) Monitoring should form part of the management of all WBT ventures and activities. It is vital that sound monitoring and management practices should be in place to oversee developments projects. This is an area that requires further development, research, and commitment from management authorities. Particularly those monitoring techniques that can be used by businesses partners (hospitality facilities and tour firms) that operate within the reserve need to be developed and implemented fully.

3) Increased funding for conservation purposes. The potential of WBT to contribute to the tourism industry in this country, coupled with the vulnerable nature of much of the wildlife habitats on which it is based, encourages an increase in well-directed and managed funding to ensure an on-going symbiosis of responsible wildlife tourism and nature conservation.

4) Market segmentation. MMNR should be for high class tourists because tourists are becoming more sophisticated and more exposed with increased leisure time and greater disposable income. Target market analysis is essential for an effective marketing strategy. Targeting requires the destination to focus marketing attention on selected groups of customers and to design, tailor, and supply products or services to meet their needs because not all customers are alike. Since it is impossible to satisfy all customers in the same way, it is more reasonable to pinpoint and selectively market only to specific niches to ensure the highest returns on marketing resources.

5) Improving policy implementation. Policies that could be particularly useful if implemented include those on the new environmental protection act, eradication of

corruption, dispersion of tourism activity around the country through an incentive system, diversification of tourism products working in partnership with the industry, and greater use of price discrimination to disperse tourists to non-traditional attractions.

6) Implementation of Wildlife Bill 2011. This will help to instill stiff penalties for activities that injure the environment and animals, higher compensation for life lost, property, crops, livestock, and injury caused by wild animals among others.

7) Recognition that there are few 'particular' answers and that different circumstances often require different solutions. A lot of environmental issues do emerge at various times with different magnitudes. The management of the reserve should be able to recognize that there are no written down answers to the particular problem, and if there is the answers cannot be able to fit that particular issues or problem.

8) Educating the public about the benefits of WBT and stakeholders participation.

9) Involving locals in decision making process. The study found out that quite a number of decisions are taken by NCC without involving the local communities who are affected by these decisions. For example the E-ticketing which has always attracted tension in the region since its inception.

### 5.3.2 Local Community Recommendations

(i) Encourage individuals and communities to give up more land for conservation.

(ii) Local communities to form or join in range groups. There are a lot of ranges near the reserve which are dong a recommendable job of conserving wildlife as well as the environment. Therefore, this should be encouraged and the communities get sensitized of its importance.

(iii) Undergoing training. Locals should get active by undergoing the training through maximizing the scholarships that are given out to them so as to help them understand and take up managerial positions in WBT facilities in their areas.

### 5.3.3 Industry operators

(i) Come up with common policies of utilizing WBT resources sustainably.

(ii) Give more incentives to individuals so as to encourage them to conserve the WBT resources as well enable them to realize the economic value of their resources.

(iii) Stop Neo-colonizing the local community. Most of WBT industry operators are often making huge profits from the local community who are ignorant of the economic value.

(iv) Support and finance local community's projects that are geared to empower them economically.

(v) Market and encourage consumption of WBT resources sustainably and also educate their clients on the importance of WBT.

### 5.3.4 Recommendations for further Research

1) Carry out detailed stakeholder analysis in the MMNR.

2) Do a detailed analysis of factors contributing to status change of the MMNR so as to advice on the mitigation strategies.

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# APPENDICES

## Appendix I: Narok County Council's interview guide

I am a student at the University of Nairobi currently pursuing a Masters Degree Programme in Environmental Planning and Management Reg. No. C50/79052/2010. As a requirement of the degree programme, I am conducting a research project on **"Assessment of Impacts of Wildlife based tourism on the environment in Kenya's protected areas: A Case Study of Maasai Mara National Reserve."**. I kindly request you to provide the information sought in order to help me achieve the purpose of the project. The information collected will be treated confidentially and used for academic purposes only.

Yours sincerely

Jairus Obangi Machogu (0722 684 301-jrsmachogu@yahoo.com)

**Section A**

Q1.Gender: Male □ Female □

Q2. How concerned are you about wildlife based tourism on the environment? Environment as composed of air, water, soil, vegetation and animals. (*please tick one*):-

Very □

Moderately □

Not at all □

Q3. How concerned are you about the well being of future tourism in the Maasai Mara National reserve? (*Please tick one*):-

Very □ Moderately □ Not at all □

Q4. What do you understand by the term wildlife based tourism?

……
……

Q5. a)Does your council have a tourism environmental management policy/action plan /strategy? Yes □ No □

b) If yes, what does it say about wildlife based tourism?

……
……
……

**SECTION B**

Q1. Which are some of the benefits of wildlife based tourism in Maasai Mara National Reserve?

i……

ii……

iii……

Q2. Specify the nature of benefits and rank the following benefiting stakeholders.

| | Stakeholder | Nature of benefit(s) | Rank |
|---|---|---|---|
| 1 | Tour operators | | |
| 2 | MoT of GoK | | |
| 3 | KWS | | |
| 4 | NCC | | |
| 5 | Hotels | | |
| 6 | Local community | | |
| 7 | Other(specify) | | |

Q3. Which challenges hinder maximum achievement of wildlife based tourism benefits in Maasai Mara National Reserve.?

i……

ii……

iii……

Q4. How can the benefits of wildlife based tourism in Maasai Mara National Reserve be enhanced?

i……

ii……

iii……

iv……

Q5. On a scale of 1-5 (where 1= strongly disagree; 2=disagree; 3=neutral; 4=agree; 5=strongly agree) indicate the extent to which the following are applicable to your as a stakeholder.

i). WBT in MMNR is beneficial because it has contributed to social amenity development in the community

ii) WBT in MMNR has contributed to greater conservation effort thus maintaining the biodiversity of the park.

**SECTION C**

Q1.Which are some of the negative impacts of wildlife based tourism in Maasai Mara National Reserve.?

i……

ii……

iii……

iv……

Q2. What are causes of negative impacts of wildlife based tourism in Maasai Mara National Reserve.?

i……

ii……

iii……

iv……

Q3. Suggest ways of mitigating and controlling negative impacts of wildlife based tourism in Maasai Mara National Reserve.

i……

ii……

iii……

iv……

Q4. To what extent are numbers of the following in Maasai Mara National Reserve limited by a permit system?

a) Tour operators

……
……
……

b) Hospitality facilities

……
……
……

c) Tourists

……
……
……

**SECTION D**

Q1. Identify the stakeholders of wildlife based tourism in Maasai Mara National Reserve.

……
……
……
……

Q2. Which challenges do stakeholders face while mitigating and controlling impacts of wildlife based tourism in Maasai Mara National Reserve?

i……

ii……

iii……

iv……

Q3. What are the roles of the following stakeholders in mitigating and controlling negative impacts of wildlife based tourism in Maasai Mara National Reserve.?

| | Stakeholder | Role in mitigating and controlling the negative impacts of WBT | Effectiveness | |
|---|---|---|---|---|
| | | | Yes | No |
| 1 | Tour operators | | | |
| 2 | MoT of GoK | | | |
| 3 | KWS | | | |
| 4 | NCCK | | | |
| 5 | Hotels | | | |
| 6 | Local community | | | |
| 7 | Other(specify) | | | |

Q4a. Do you think you have a role in reducing the impacts of wildlife based tourism in Maasai Mara national reserve?

Yes □ No □

Q4b. If yes specify…….

Q5. If yes, what incentives are offered to encourage you in your participation in wildlife based tourism sustainability?

…….....

……

Q6. Who do you think should be the most responsible in ensuring wildlife based tourism sustainability? .....

Q7. Which ways have you been involved in mitigating negative impacts of wildlife based tourism sustainability?

i……

ii……

iii……

iv……

Q8. In the scale of 1-5 how do you rate the following stakeholders in their role execution towards sustainability of wildlife based tourism in Maasai Mara National reserve? Where, 5- Excellent, 4-very good, 3- good, 2-poor and 1-very poor. (Indicate by ticking)

| Stakeholder | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Tour operators | | | | | |
| MoT of GoK | | | | | |
| KWS | | | | | |
| NCC | | | | | |
| Other(specify) | | | | | |

**Thank you very much**

**Appendix II: Tour Operators' questionnaire**

I am a student at the University of Nairobi currently pursuing a Masters Degree Programme in Environmental Planning and Management Reg. No. C50/79052/2010. As a requirement of the degree programme, I am conducting a research project on **"Assessment of Impacts of Wildlife based tourism on the environment in Kenya's protected areas: A Case Study of Maasai Mara National Reserve."**. I kindly request you to provide the information sought in order to help me achieve the purpose of the project. The information collected will be treated confidentially and used for academic purposes only.

Yours sincerely

Jairus Obangi Machogu (0722 684 301-jrsmachogu@yahoo.com)

**Section A**

Q1.Gender: Male □ Female □

Q2. How concerned are you about wildlife based tourism on the environment? Environment as composed of air, water, soil, vegetation and animals. (*please tick one*):-

Very □

Moderately □

Not at all □

Q3. With the current issues facing Maasai Mara National Reserve, how concerned are you about the well being of future tourism in the reserve? (*Please tick one*):-

Very □ Moderately □ Not at all □

Q4. What do you understand by the term wildlife based tourism?

……
……

Q5. a)Does your tour firm have a tourism environmental management policy/action plan /strategy? Yes □ No □

b) If yes, what does it say about wildlife based tourism?

……

……

……

……

**SECTION B**

Q1. Which are some of the benefits of wildlife based tourism in Maasai Mara National Reserve.

i……

ii……

ii……

iv……

Q2. Specify the nature of benefits and rank the following benefiting stakeholders.

| | Stakeholder | Nature of benefit(s) | Rank |
|---|---|---|---|
| 1 | Tour operators | | |
| 2 | MoT of GoK | | |
| 3 | KWS | | |
| 4 | NCC | | |
| 5 | Hotels | | |
| 6 | Local community | | |
| 7 | Other(specify) | | |

Q3. Which challenges hinder maximum achievement of wildlife based tourism benefits in Maasai Mara National Reserve.?

i……

ii……

iii……

iv……

Q4. How can the benefits of wildlife based tourism in Maasai Mara National Reserve be enhanced?

i……

ii……

iii……

iv……

Q5. On a scale of 1-5 (where 1= strongly disagree; 2=disagree; 3=neutral; 4=agree; 5=strongly agree) indicate the extent to which the following are applicable to your as a stakeholder.

i). WBT in MMNR is beneficial because it has contributed to social amenity development in the community

ii) WBT in MMNR has contributed to greater conservation effort thus maintaining the biodiversity of the park.

**SECTION C**

Q1.which are some of the negative impacts of wildlife based tourism in Maasai Mara National Reserve.?

i……

ii……

iii……

iv……

Q2. What are causes of negative impacts of wildlife based tourism in Maasai Mara National Reserve.?

i……

ii……

iii……

iv……

Q3. What is your tour firm doing to monitor, assess and manage negative impacts of wildlife based tourism on the environment in Maasai Mara National Reserve?

i……

ii……

iii……

iv……

Q4. Suggest ways of mitigating and controlling wildlife based tourism negative impacts in Maasai Mara National Reserve.

i……

ii……

iii……

iv……

**SECTION D**

Q1. Identify the stakeholders in wildlife based tourism in Maasai Mara National Reserve.

……

……

……

……

…….....

Q2. Which challenges do stakeholders face while mitigating and controlling impacts of wildlife based tourism in Maasai Mara National Reserve?

i……

ii……

iii……

iv……

Q3. What are the roles of the following in mitigating and controlling negative impacts of wildlife based tourism in Maasai Mara National Reserve.? Fill the table below:

| | Stakeholder | Role in mitigating and controlling the negative impacts of WBT | Effectiveness | |
|---|---|---|---|---|
| | | | Yes | No |
| 1 | Tour operators | | | |
| 2 | MoT of GoK | | | |
| 3 | KWS | | | |
| 4 | NCC | | | |
| 5 | Hotels | | | |
| 6 | Local community | | | |
| 7 | Other(specify) | | | |

Q4a. Do you think you have a role in reducing the impacts of wildlife based tourism in Maasai Mara national reserve?

Yes □ No □

Q4b. if yes specify…….

Q5. If yes, what incentives are offered to encourage you in your participation in wildlife based tourism sustainability?

…….....

……

Q6. Who do you think should be the most responsible in ensuring wildlife based tourism sustainability? .....

Q7. Which ways has your tour firm been involved in mitigating negative impacts of wildlife based tourism sustainability?

i……

ii……

iii……

iv……

Q8. In the scale of 1-5 how do you rate the following stakeholders in their role execution towards sustainability of wildlife based tourism in Maasai Mara National reserve? Where, 5- Excellent, 4-very good, 3- good, 2-poor and 1-very poor. (Indicate by ticking)

| Stakeholder | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Tour operators | | | | | |
| MoT of GoK | | | | | |
| KWS | | | | | |
| NCC | | | | | |
| Other(specify) | | | | | |

**THANK YOU VERY MUCH**

**Appendix III: Tourists' Survey Questionnaire**

I am a student at the University of Nairobi currently pursuing a Masters Degree Programme in Environmental Planning and Management Reg. No. C50/79052/2010. As a requirement of the degree programme, I am conducting a research project on **"Assessment of Impacts of Wildlife based tourism on the environment in Kenya's protected areas: A Case Study of Maasai Mara National Reserve."**. I kindly request you to provide the information sought in order to help me achieve the purpose of the project. The information collected will be treated confidentially and used for academic purposes only.

Yours sincerely

Jairus Obangi Machogu (0722 684 301-jrsmachogu@yahoo.com)

Q1.Gender: Male □ Female □

Q2. What is the level of your education?

……

Q3. What is your nationality? ...……

Q4.What is the duration of your stay at this reserve? .....

Q5. How many trips have you made to Maasai Mara National Reserve in the last four decades, prior to this visit? .....

Q6. Give any environmental changes that have occurred in the reserve since your last visit.

i) ……

ii) ……

iii) ……..

iv)……..

v) …….....

Q7. What do you understand by the term wildlife based tourism?

……
……

Q7. How concerned are you about wildlife based tourism on the environment? Environment as composed of air, water, soil, vegetation and animals. (*please tick one*):-

Very □

Moderately □

Not at all □

Q8. Please give each of the following reserve characteristics a score of 0-5 in terms of how important they are to you on a trip to Maasai Mara National Reserve.

| **Reserve Characteristics** | **0** | **1** | **2** | **3** | **4** | **5** |
|---|---|---|---|---|---|---|
| Attractive scenery | | | | | | |
| High Bird Diversity | | | | | | |
| High Mammal Diversity | | | | | | |
| High Floral Diversity | | | | | | |
| The Big Five | | | | | | |

Q9.In your own opinion how can the benefits of wildlife based tourism in Maasai Mara National Reserve be enhanced?

i……

ii……

iii……

iv……

v…….....

……

Q10a. Do you agree that wildlife based tourism activities generate negative impacts on the environment?

Yes □ No □

Q10b. If yes, identify some of the negative impacts to the environment.

i……..

ii……

iii……..

iv……..

v…….

Q11a. Do you think you have a role in reducing the environmental impacts of wildlife based tourism in Maasai Mara national reserve?

Yes □ No □

Q11b. If yes, specify……..

Q12. What incentives are offered to encourage you in your participation in wildlife based tourism sustainability?

…….....

……

Q13. Which ways have you been involved in mitigating negative impacts of wildlife based tourism on the environment in Maasai Mara National Reserve?

i……

ii……

iii……

iv……

v…….....

……

**Appendix IV: Hospitality Managers' Questionnaire**

I am a student at the University of Nairobi currently pursuing a Masters Degree Programme in Environmental Planning and Management Reg. No. C50/79052/2010. As a requirement of the degree programme, I am conducting a research project on **"Assessment of Impacts of Wildlife based tourism on the environment in Kenya's protected areas: A Case Study of Maasai Mara National Reserve."**. I kindly request you to provide the information sought in order to help me achieve the purpose of the project. The information collected will be treated confidentially and used for academic purposes only.

Yours sincerely

Jairus Obangi Machogu (0722 684 301-jrsmachogu@yahoo.com)

**Section A**

Q1.Gender: Male □ Female □

Q2. How concerned are you about wildlife based tourism on the environment? Environment as composed of air, water, soil, vegetation and animals. (*please tick one*):-

Very □

Moderately □

Not at all □

Q3. With the current issues facing Maasai Mara National Reserve, how concerned are you about the well being of future tourism in the reserve? (*Please tick one*):-

Very □ moderately □ Not at all □

Q4. What do you understand by the term wildlife based tourism?

……
……

Q5. a)Does your hotel/Lodge/campsite have a tourism environmental management policy/action plan /strategy? Yes □ No □

b) If yes, what does it say about wildlife based tourism?

……
……
…….

**SECTION B**

Q1. Which are some of the benefits you receive from wildlife based tourism in Maasai Mara National Reserve.

i……

ii……

iii……

iv……

Q2. Specify the nature of benefits sand rank the following benefiting stakeholders.

| | Stakeholder | Nature of benefit(s) | Rank |
|---|---|---|---|
| 1 | Tour operators | | |
| 2 | MoT of GoK | | |
| 3 | KWS | | |
| 4 | NCC | | |
| 5 | Hotels | | |
| 6 | Local community | | |
| 7 | Other(specify) | | |

Q3. Which challenges that hinder maximum achievement of wildlife based tourism benefits in Maasai Mara National Reserve.?

i……

ii……

iii……

iv……

Q4. How can the benefits of wildlife based tourism in Maasai Mara National Reserve be enhanced?

i……

ii……

iii……

iv……

Q5. On a scale of 1-5 (where 1= strongly disagree; 2=disagree; 3=neutral; 4=agree; 5=strongly agree) indicate the extent to which the following are applicable to your as a stakeholder.

i). WBT in MMNR is beneficial because it has contributed to social amenity development in the community

ii) WBT in MMNR has contributed to greater conservation effort thus maintaining the biodiversity of the park.

**SECTION C**

Q1. Which are some of the major ecological changes you have noticed in Maasai Mara National Reserve?

i……

ii……

iii……

iv……

Q2.What are the negative impacts of wildlife based tourism in Maasai Mara National Reserve.?

i……

ii……

iii……

iv……

Q3. What are the causes of negative impacts of wildlife based tourism in Maasai Mara National Reserve.?

i……

ii……

iii……

iv……

Q4. Suggest ways of mitigating and controlling wildlife based tourism negative impacts in Maasai Mara National Reserve.

i……

ii……

iii……

iv……

**SECTION D**

Q1. Identify the stakeholders of wildlife based tourism in Maasai Mara National Reserve.

……
……
……
……

Q2. Which challenges do stakeholders face while mitigating and controlling impacts of wildlife based tourism in Maasai Mara National Reserve?

i……

ii……

iii……

iv……

Q3. What are the roles of the following stakeholders in mitigating and controlling negative impacts of wildlife based tourism in Maasai Mara National Reserve?

| | Stakeholder | Role in mitigating and controlling the negative impacts of WBT | Effectiveness | |
|---|---|---|---|---|
| | | | Yes | No |
| 1 | Tour operators | | | |
| 2 | MoT of GoK | | | |
| 3 | KWS | | | |
| 4 | NCC | | | |
| 5 | Hotels | | | |
| 6 | Local community | | | |
| 7 | Other(specify) | | | |

Q4a. Do you think you have a role in reducing the impacts of wildlife based tourism in Maasai Mara national reserve?

Yes □ No □

Q4b. If yes, specify……

Q5. If yes, what incentives are offered to encourage you in your participation in wildlife based tourism sustainability?

…….....

……

Q6. Who do you think should be the most responsible in ensuring wildlife based tourism sustainability? .....

Q7. Which ways have you been involved in mitigating environmental negative impacts of wildlife based tourism?

i……

ii……

iii……

iv……

Q8. In the scale of 1-5 how do you rate the following stakeholders in their role execution towards sustainability of wildlife based tourism in Maasai Mara National reserve? Where, 5- Excellent, 4-very good, 3- good, 2-poor and 1-very poor. (Indicate by ticking)

| Stakeholder | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Tour operators | | | | | |
| MoT of GoK | | | | | |
| KWS | | | | | |
| NCC | | | | | |
| Other(specify) | | | | | |

**THANK YOU VERY MUCH**

**Appendix V: Local community's' Survey Questionnaire**

I am a student at the University of Nairobi currently pursuing a Masters Degree Programme in Environmental Planning and Management Reg. No. C50/79052/2010. As a requirement of the degree programme, I am conducting a research project on **"Assessment of Impacts of Wildlife based tourism on the environment in Kenya's protected areas: A Case Study of Maasai Mara National Reserve."**. I kindly request you to provide the information sought in order to help me achieve the purpose of the project. The information collected will be treated confidentially and used for academic purposes only.

Yours sincerely

Jairus Obangi Machogu (0722 684 301-jrsmachogu@yahoo.com)

**Section A**

Q1.Gender: Male □ Female □

Q2. How concerned are you about wildlife based tourism on the environment? Environment as composed of air, water, soil, vegetation and animals. (*please tick one*):-

Very □

Moderately □

Not at all □

Q3. With the current issues facing Maasai Mara National Reserve, how concerned are you about the well being of future tourism in the reserve? (*Please tick one*):-

Very □ Moderately □ Not at all □

Q4. What do you understand by the term wildlife based tourism?

……
……

Q5a Does your community have a tourism environmental management policy/action plan /strategy? Yes □ No □

b) If yes, what does it say about wildlife based tourism?

……
……
…….

**SECTION B**

Q1. Which are some of the benefits your community receives from wildlife based tourism in Maasai Mara National Reserve?

i……

ii……

iii……

iv……

Q2. Specify the nature of benefits and rank the following benefiting stakeholders.

| | Stakeholder | Nature of benefit(s) | Rank |
|---|---|---|---|
| 1 | Tour operators | | |
| 2 | MoT of GoK | | |
| 3 | KWS | | |
| 4 | NCC | | |
| 5 | Hotels | | |
| 6 | Local community | | |
| 7 | Other(specify) | | |

Q3. Which are some of the challenges that hinder maximum achievement of wildlife based tourism benefits in Maasai Mara National Reserve.?

i……

ii……

iii……

iv……

Q4. How can the benefits of wildlife based tourism in Maasai Mara National Reserve be enhanced?

i……

ii……

iii……

iv……

Q5. On a scale of 1-5 (where 1= strongly disagree; 2=disagree; 3=neutral; 4=agree; 5=strongly agree) indicate the extent to which the following are applicable to your as a stakeholder.

i). WBT in MMNR is beneficial because it has contributed to social amenity development in the community

ii) WBT in MMNR has contributed to greater conservation effort thus maintaining the biodiversity of the park.

**SECTION C**

Q1.which are some of negative impacts of wildlife based tourism in Maasai Mara National Reserve.?

i……

ii……

iii……

iv……

Q2. What are the causes of negative impacts of wildlife based tourism in Maasai Mara National Reserve?

i……

ii……

iii……

iv……

Q3. Suggest ways of mitigating and controlling negative impacts of wildlife based tourism in Maasai Mara National Reserve.

i……

ii……

iii……

……

Q4.What do you see as the main obstacles to sustainability of current or future wildlife based tourism?

i……

ii……

iii……

iv……

**SECTION D**

Q1. Identify the stakeholders of wildlife based tourism in Maasai Mara National Reserve.

……
……
……
……

Q2. Which challenges do stakeholders face while mitigating and controlling impacts of wildlife based tourism in Maasai Mara National Reserve?

i……

ii……

iii……

iv……

Q3. What are the roles of stakeholders in mitigating and controlling negative impacts of wildlife based tourism in Maasai Mara National Reserve.? Fill the table below:

| | Stakeholder | Role in mitigating and controlling the negative impacts of WBT | Effectiveness | |
|---|---|---|---|---|
| | | | Yes | No |
| 1 | Tour operators | | | |
| 2 | MoT of GoK | | | |
| 3 | KWS | | | |
| 4 | NCC | | | |
| 5 | Hotels | | | |
| 6 | Local community | | | |
| 7 | Other(specify) | | | |

Q4a. Do you think you have a role in reducing the impacts of wildlife based tourism in Maasai Mara national reserve?

Yes □ No □

Q4b. If yes, specify……

Q5. If yes, what incentives are offered to encourage you in your participation in wildlife based tourism sustainability?

…….....

……

Q6. Who do you think should be the most responsible in ensuring wildlife based tourism sustainability? .....

Q7. Which ways have you been involved in mitigating negative impacts of wildlife based tourism?

i……

ii……

iii……

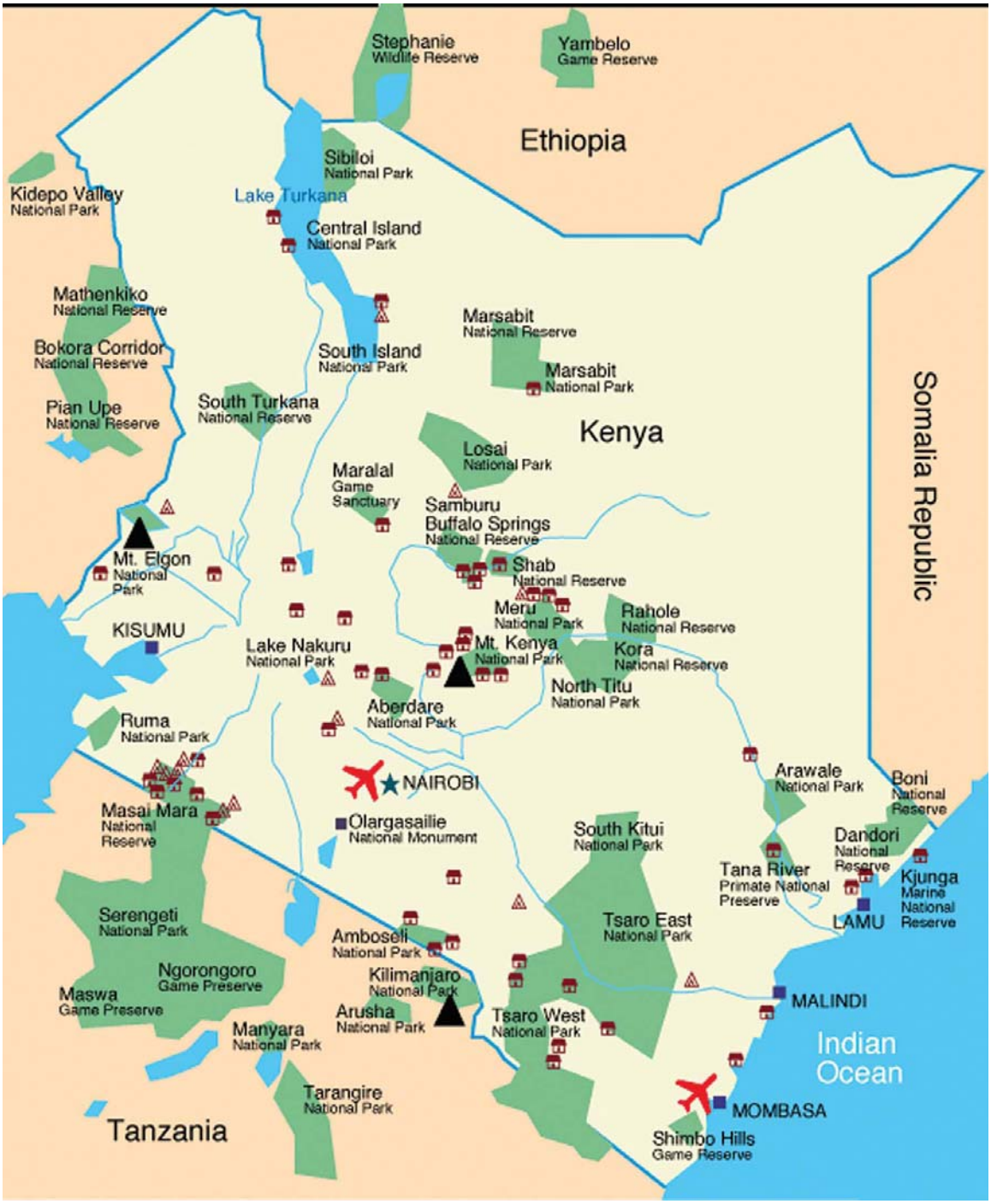
iv……

Q8. In the scale of 1-5 how do you rate the following stakeholders in their role execution towards sustainability of wildlife based tourism in Maasai Mara National reserve? Where, 5- Excellent, 4-very good, 3- good, 2-poor and 1-very poor. (Indicate by ticking)

| Stakeholder | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Tour operators | | | | | |
| MoT of GoK | | | | | |
| KWS | | | | | |
| NCC | | | | | |
| Other(specify) | | | | | |

**THANK YOU VERY MUCH.**

**Appendix VI: Kenya's Parks and Reserves (Conservation Areas)**




Source: Odunga and Maingi, 2011