

# Is Tourism Always Beneficial? A Case Study from Masai Mara National Reserve, Narok, Kenya.

Medani Bhandari, Ph.D.

Akamai University, Department of Sustainability Studies, Hilo, HI.  
International Program Director, Atlantic State Legal Foundation, Syracuse, NY.

E-mail: [bhandari@gmail.com](mailto:bhandari@gmail.com)\*

## ABSTRACT

Tourism within Kenya is found to be very successful in terms of economic benefit. The natural beauty and the existence of an abundance of wildlife attract many tourists from the developed world. Tourists like to see the wildlife as much as possible and at close proximity. To display wildlife to its best advantage, tourist van operators drive their vehicles anywhere they can to show the wildlife at close quarters, particularly the big five wildlife such as the lion, cheetah, wild buffalo, rhinoceros, and wild elephant. This process has increased in most of the Kenyan National Parks and the Wildlife Reserve. The Masai Mara Reserve is one of the most used reserves in Kenya for off road driving. Masai Mara adjoins the Serengeti National Park of Tanzania, from where millions of wildlife travel to Masai Mara every year as this is their migration route. The migration is one of the biggest wildlife events on Earth and thousands of people go to see it. In this study we have analyzed the general tourist flow in Kenya with special focus on the Masai Mara Reserve. The research is mainly based on secondary data provided by experts from Kenya and field research from 1998, 2000 and 2003. The analysis reveals that there is a significant negative impact of off road driving, attributed to uncontrolled tourist vans and safari in the Masai Mara National Reserve. The damage rate is significant. Tourist roads and tracks are increasing by about 30 percent annually since 1998. To protect this most spectacular place on earth for wildlife it is vital that control measures and mechanisms be implemented to manage off-road driving.

(Keywords: ecotourism, wildlife observation, off road impact, safari, Africa)

## INTRODUCTION

Biological resources and areas are being depleted daily in developing countries. Population pressure and increasing demand for biological resources for various purposes are responsible for the reduction of these resources. This continuing process of depletion may cause natural imbalances as well as a decrease in wildlife population (IUCN-1991). The protection of nature and social justice are synonymous with one another. The protection of nature is an issue debated among politicians rather than simply an issue of ecology. An ecological perspective is an essential element of environmental protection; however, it is acknowledged here that protection of the environment is also a complex social issue. Conservation cannot succeed without spiritual, moral, and political guidance. Conservation most aspires to ethical virtue, which if not pursued then conservation will lose its essence (Brechin 1991, Brechin *et al.* 1993 and 2003).

The wildlife depletion rate is high and its cause is over exploitation of natural resources and encroachment on unprotected and protected natural areas. Protected areas are established to safeguard outstanding examples of natural heritage for their own sake, for the conservation of life-support systems and biological diversity, and for human enjoyment. National park areas are designated to maintain the diversity of ecosystems, species, and wild genes. Wild-species and populations are highly sensitive to human and domestic animal disturbance (IUCN-1991). Disturbances are increasing due to uncontrolled tourism in many protected areas. Kenya is one of many countries which are gaining from tourism on one hand while on the other hand there is a negative impact on its protected areas (Bhandari 1998, Ondicho 2000, Walpole *et al.* 2003).

Tourism is considered one of the fastest growing industries around the world. UNEP (2002) states "the tourism industry generates substantial economic benefits to both host countries and tourists' home countries. Especially in developing countries, one of the primary motivations for a region to promote itself as a tourism destination is the expected economic improvement". Geoffrey Lipman (of WTO-OMT on World Tourism Organization to UNCTAD XI Sao Paulo, Brazil June 15th 2004) acknowledges that the benefits of tourism are realized only in the developed world, and that the contribution of international tourism is less than 5% to the world's poorest countries.

Lipman states that contribution to the poorest parts of the world will radically increase by 2015. The WTO document also states that "Tourism – sustainably developed and managed - can be a beacon sector for the world's poor. Increasing foreign exchange, promoting entrepreneurship, stimulating infrastructure investment, creating millions of skilled jobs". How, to whom and by which paths the document is silent. The document further says it will "boost liberalization directly and indirectly in the linked economy". The policy document of WTO and other organizations are always silent about the negative consequences of the tourism industry in general and particularly in the case of the developing world. On the other hand the United Nations Environment Program presents the negative and positive aspects of tourism in parallel.

Several agencies have studied the beneficial side of tourism (WTO, IUCN, and WRI 2000), and many authors offer perspectives on tourism and development, e.g. Eccles and Costa 1996, who have analyzed four basic contexts of tourism: sustainable tourism, transport, new products and the future of tourism. While examining the available literature from 1989 to 1994 in these categories in the context of sustainable tourism, they analyzed the literature of Ayala, H., (1995), "From quality product to eco product, Harrison, D., (1995) "Development of tourism", Garcia-Ramon, M.D., (1995) "Farm tourism, gender and the environment in Spain", Echtner, C.M., (1995) "Entrepreneurial training in developing countries", Hughes, G., (1995): "The cultural construction of sustainable tourism and Orams, M.B. (1995), "Towards a more desirable form of ecotourism. In relation to transport they analyze the literature on airlines industries and in the category of the future of tourism they analyze the changing nature of

tourism. In another article on tourism marketing, sustainable development and international tourism (Eccles 1995), the author's meta-analysis is related to destination planning, marketing and promotion, and new products. In relation to transport each of the authors he has presented (nine) discussed destination drivers, but none of them shows the relationship of tourist flow and its impact on actual physical impacts. Another article entitled "Contemporary Tourism Issues" (Hing and Dimmock, 1997) is also a meta-analysis derived from 1989 to 1996 literature on tourism; these authors have presented ninety eight theme from the selected articles, but none of them are related to in-situ impacts of tourism in the national parks.

Much research has examined global environmental problems directly or indirectly related to natural resource management, park-people conflict, the politics of conservation, and national and international conservation movements. Regarding politics and conservation few authors have highlighted the consequences of external pressures on national parks and wildlife reserves. Some authors have analyzed environmental problems from the historical perspective. Several have stated that environmental history is multidisciplinary (Nash 1972; Opie 1983; Worster 1984, 1990 (a, b); White 1985, as cited by Bowman 2001). According to Foster (2000) "many fundamental insights into ecological processes and major environmental issues come out not through reductionist or high tech studies of modern conditions but from thoughtful consideration of natural history. In fact it is foolhardy to make any ecological interpretation of modern landscapes or environments or to formulate policy in conservation or natural resource management without historical context that extends back decades, at least, but preferably centuries or millennia" (as cited by Bowman 2001). Here in this article, we link the environmental history in terms of Masai tribe relationships with nature and impact in the national reserve due to the use of modern means of transportation.

This paper also examines the environmental politics and underlying conflicts of park and Masai people. Most of the cases of park-people conflict occur when people are prevented from access to the natural resources which traditionally they had been using. Another cause of conflict arises when wildlife come out from the protected areas and damage the crops or harm

local people's property (Nepal and Weber 1995; Vandergeest, 1996; Naughton-Treves, 1998; Norton-Griffiths, 1996; Bhandari 1998). This situation is particularly common in those areas where local people have limited life support resources. Wildlife roaming outside the protected areas mostly occurs when there is insufficient food for the wildlife or their habitat is poorly managed. In Masai Mara National Reserve both situations can be observed. Masai Mara is on the route of annual migration of wildebeest and other wildlife. This results in extreme pressure of tourist overflow in the reserve, as it leads to off-road driving, which ultimately damages the wildlife habitat.

Another pressure comes from the local people who graze their cattle within the parks (Cussins 1996; Yeager and Miller 1986). In the Masai Mara National Reserve (MMNR) the Masai people face two main problems. The first is encounter with wildlife (wildlife damage their crops, deprive domestic livestock, sometimes livestock or even people are killed), while the second is competition for access to wood, grasses, water and other resources (Hart and O'Connell, 2000, Ngure, 1995, Norton-Griffiths, 1996, O'Connell et al., 1998). There is underlying politics involved in the management of MMNR. All stakeholders are not equally consulted on matters of reserve management.

For the better management of the park affected people should have participated in the planning process for establishing and managing the park, or been offered access to some alternative resources that would substitute for the traditional lifestyle (Lewis and Alpert 1996; Sibanda and Omwega 1996), but historically this has generally not been done (Yeager and Miller; Sibanda and Omwega 1996). As an example of the types of problems that arise with park establishment, five major causes of park-people conflicts have occurred in Nepal's Royal Chitwan National Park, despite the lack of wild elephants. Illegal taking of forest products, livestock grazing in the park, illegal hunting and fishing, crop damage, and threats to human and animal life caused by wild animals from the park all contribute to a diverse range of park-people conflicts (Nepal and Weber 1995).

"The Masai incur immediate and direct social and environmental costs from tourism development and wildlife conservation; they suffer damage by park wildlife and forego the opportunity of using

this protected land for agricultural production; but insignificant amounts of the country's tourism receipts trickle down to the Masai in areas adjacent to the attractions" (John S. Akama 1999). Theoretically Masai Mara National Reserve is in a dual management system administered by the local counties and the Kenyan Wildlife Service (Bhandari 1998). There are internal and external stakeholders in Reserve management as well as tourism management. "Social and economic scenario has been accentuated by state tourism and wildlife policies which focus narrowly on the protection of park wildlife for foreign tourists without any involvement of the Masai in the management and utilization of these resources.....It has been noted that there is a major foreign presence in almost all of the country's tourism subsectors, such as marketing and promotion, travel and transport, and hotel and hospitality service. In consequence, there is high leakage of Kenya's tourism receipts" (Akama, 1999).

Major tour operators are not local people and there are tensions between tour operators, big hotels and local camps (local camps are generally operated by Masai people). This study examines the socio economic and biophysical impact due to unmanaged tourist flow in the reserve and the socio-ecological politics of tourism in Kenya on the basis of Masai Mara's case study. Further our research explores the tourism impacts in Masai Mara National Reserve in terms of both bio-physical damage and socio-economic influences.

Tourism has direct socioeconomic influence on Kenyan national economic development. This has raised critical concerns in various part of the world, and has unwanted social, economic, and environmental costs and can affect the existing socio-political system (Conroy, Murray and Rosset 1996; Murray 1994; Stonich 1993; Williams 1986 as cited by Stonich 1998). External and internal tourism flow can have serious problems due to these costs. As globalization, neo-liberalization and the open trade concept is growing, the local populations and the local tourism industry have to face competition. In Masai Mara the most of the tourism operators are not Masai but either Indian business people or western business entrepreneurs. The research shows the major stakeholders and the beneficiaries of the tourism industry. Various studies have shown that on a per capita basis, the demands of tourism significantly surpass

domestic and municipal demands (Gajraj 1981; Grenon and Batisse, 1989; Lvovich and White, 1990; Archer, 1985; Hunter and Green, 1995; Kocasoy, 1989, 1995; UNEP 1984, as cited by Stonich 1998).

### **Politics, Ecology and Tourism Industry**

“Political ecology grounds ‘ecology in the web of social relations that ties...households together and links them to larger economic and political entities’. Political ecology combines the concerns of ecology and a broadly defined political economy. Together this encompasses the constantly shifting dialectic between society and land-based resources, and also within classes and groups within society itself” (Blaikie and Brookfield, 1987; Land Degradation and Society (<http://espm.berkeley.edu/classes/espm-155/2001/definitions.html>)).

Political ecology is the study of the political environment using the methods and language of ecology which includes animals and plants, family systems to societies and states. It is the study of the political struggle to obtain the natural resources and of the power games of stakeholders. It advocates for the protection of biodiversity and natural resources and helps to formulate public policy to maintain the natural resources. The field of political ecology is multidisciplinary; primarily it is close to anthropology and geography but covers other disciplines as well. It tries to bring together politics in terms of economy and culture in terms of ecology. Akama, Lant, and Burnett (1996) have used a political-ecological framework in the analysis of the social factors of wildlife conservation in Kenya. According to them, “the wildlife conservation efforts of the Kenya government confront complex and often persistent social and ecological problems, including land-use conflicts between the local people and wildlife, local people's suspicions and hostilities toward state policies of wildlife conservation, and accelerated destruction of wildlife habitats”. We here examine the politics of power, authority and the impact of globalization on tourism development in Kenya, in the case of Masai Mara.

In theorizing the politics of environment management the Foucauldian perspective can also be important. It is applicable in political ecology as well in the power and politics relationship in tourism management. For Foucault,

government meant not so much the political or administrative structures of the modern state as “the way in which the conduct of individuals or of groups might be directed: the government of children, of souls, of communities, of families, of the sick.... To govern, in this sense, is to structure the possible field of action of others and governmentality includes a growing body of knowledge that presents itself as “scientific,” and which contributes to the power of governmentality (from Works of Michel Foucault, <http://users.california.com/~rathbone/foucau10.htm>).

Management of tourism can therefore be management of all stakeholders involved in the Masai Mara tourism sector. Furthermore, Foucault states that power is very important in handling the politics or any other sectors; power also plays an important role in establishing a relationship between concerned people which ultimately affects all connected or concerned people. It is different from force or violence but can affect physically. Power is powerful enough to penetrate societal relationships. He highlights the relationship between knowledge and power. In the context of Masai Mara tourism politics external forces are more powerful, preventing the local stakeholder from establishing reciprocal relationships.

“Parks present a complicated intersection of ecological, economic, political, and cultural issues whose evaluation requires careful reporting. Neumann draws on theories of European aesthetics, state practices, moral economies, and peasant resistance to organize this complexity” (Haenn, 2000; Neumann, 1998), provides a general outline of nature conservation in East African countries, with a case study from Tanzania’s Arusha National Park. Neumann aims “to analyze the conflicts between nature protection and rural livelihoods in Africa within their historical and sociopolitical context” (Neumann, 1998). He describes how the African continent was used by the colonial powers, who imposed their perspectives on forest protection, for example, German style or British style. British colonists commonly imposed their conservation pattern in the countries where they ruled (Neumann, 1998; Agrawal, 2005). Neumann says that African people were seen by the colonial power as “Part of our fauna” (Neumann, 1998), which was “barbarism and ignorance” (page 139). Neumann provides the historical background for current park research. He claims

that various on-going activities for conservation are oriented toward elite tourists or dependency on tourist flow. He shows how the decision making process is undertaken in the management of the national parks and reserves in Africa through the National Parks Ordinance [which] explicitly protected customary rights, but it was the *park officials* who decided what those rights were and who would be entitled to them" (page 133).

He reveals the morality decay in conservation which is based on immoral economics: "subsistence 'guarantees' are sought through attempts to create new relations of mutual obligations or reciprocity that are judged against the standard of a local normative system" (page 44). He highlights the struggle for local ethnic identities and local clan controlled land tenure systems. He touches on "issues of race, social class, ethnicity, kinship, political organization, resistance, land tenure, and, more generally, cultural values. Haenn writes in her critique that as the concept grows in size, its explanatory power decreases; he never ties together the diverse strands of argumentation (Haenn, 2000). Despite this criticism, however, Neumann's study gives the Tanzanian context which is very similar to the Kenyan context in relation to tourism management and resource management. Both Kenya and Tanzania were colonized by the British and are still influenced by the western model of conservation through militarization.

An important area is the politics of land degradation, which has been occurring in Masai Mara due to tourism (no information of exact date but at least since 1963, primarily after the date of Kenya's independence from British colonization). According to Blaikie and Brookfield (1987) "Land degradation is both a result and a cause of social marginalization". We support Blaikie and Brookfield's theses and will reveal the scenario of land degradation due to tourism and how the indigenous local Masai people are sidelined in the tourism industry. According to Dove (1999), "in the context of the then-prevailing deprecation of indigenous societies under the aegis of high-modernist development theory, the detailed descriptions of vernacular technology and knowledge central to early ecological anthropology can now be read as politically empowering counter discourses."

According to Susan Paulson (2003) "political ecology of the 1990s and beyond opened up the category by giving greater salience to the ethnic

identities, gender roles and relations, institutions, governance apparatuses, political involvements, and other social factors that condition the knowledge, decisions, and actions of diverse land managers. Notable here are feminist insights into the gendered character of environmental knowledge and practice, concern with indigenous rights and territorial autonomy, and critical analyses of institutional and development processes informed by movements for social and environmental justice" (supported also by Bryant, 2002; Gezon, 2002; Zimmerer, 2000, Peet and Watts, 1996; Rocheleau, Thomas-Slayter, and Wangari, 1996; Carney, 1996; Mackenzie, 1995; Jones, 1995; Braidotti et al., 1994; Guha, 1994; Schroeder, 1993; Shiva, 1988; Bassett, 1988; as cited by Paulson, 2003). Paulson's thesis provides us additional grounds to group the impacts of tourism in the Masai Mara National Reserve on biomass, soil, and environmental quality, including effects on biodiversity, soil erosion, pollution, and degradation of water and other natural resources.

### **Tourism Development Trends in Kenya**

Kenya is one of the best destinations for wildlife safaris. Since the British colonial period western European people have traveled to Kenya to see the abundance of wildlife and its beauty. Kenya was colonized by the British and the first independent government was formed in June 1963. In the early days people used to go to Kenya for hunting. Kenya banned fur hunting in 1977, but hunting continued as part of the local culture until last decade. Kenya is located across the equator and has neighboring countries Sudan, Somalia and Ethiopia to the North, Tanzania to the South, the Indian Ocean to the East, and Uganda to the west. In Tanzania hunting is not banned and wildlife that crosses the Tanzanian boarder through the Mara River is likely to be hunted. However, Kenya is considered one of the foremost countries for biodiversity, having an abundance of wildlife.

Tourism is the largest source of foreign exchange in Kenya and represents about 10% of GDP. The *annual tourist flow* in Kenya increased from 358,500 in 1984, 604,000 in 1986, 676,900 in 1988. The revenue from tourism increased from US \$25.2 million to US \$404.7 million in 1988 (CBS Kenya, various years). From 1988 to 1990 *tourist shopping* increased by 39 percent, and lodging and food expenditure dropped by 38

percent. Changes of tourist expenditures were as follows in those years; 26.6% to 23% accommodation, 27.4% to 39% shopping, 16.9% to 15% food and from 10.1% to 7.6% entertainment, 15.6% to 13.3% local transportation and other from 3.4% to about 2% of 100% expenditure (CBS Kenya various years).

From 1990 the tourism industry declined because of the ethnic problems in the country. In 1994, about 1,008,300 tourists arrived in Kenya, mainly for wildlife safaris, falling to 973,614 in 1995 (Kenya 1997). 804,600 in 1991, 963,500 in 1993, 973,614 in 1995, to 1,000,600 in 1997 (CBS Kenya, various years). Another reason was the severe weather conditions and illness due to the El Nino rain in 1997. Calamities continued to affect the Kenyan tourism industries, not least the bombing of the United States Embassy in Nairobi in 1998. However, in 1999, 780,000 visitors came to Kenya for wildlife safaris and the country generated about US \$500 million, which is their largest source of foreign exchange (Ondicho-2000). All tourist expenditures also changed accordingly, such as 44 percent for lodging and food, and 27 percent for shopping.

In addition to wildlife safaris, many people visit Kenya to participate in international conferences, during which they visit the national parks and reserves. Nairobi is considered one of the best venues for the conferences. There were 19 international conferences held in Nairobi in 1988 (180 days), following 58 in 1987 (176 days). This trend is still evident, and wildlife safaris after international conferences are still common (Kenyalogy 2005). Employment in the tourism industry also increased as tourists flowed into the country. There were 106,500 people employed in the tourism sector in 1987, and this number reached 170,000 in 1994. There are about 340,000 people receiving payment from this industry, which is about 11% of total wages (CBS Kenya 1998-2003).

The primary tourist attraction is the abundance of wildlife in open areas, national parks and wildlife reserves. There are 24 National Parks, 27 National Reserves, and three game sanctuaries. Among the best known are the Masai Mara National Reserves and Amboseli National Park. Of the total land surface area of Kenya, 7% is under the protected area system; however, about 80% of wildlife move outside the park in the course of their migration routes (Ondicho 2000). The Masai Mara Reserve can generate US \$5.5

million from tourist entry fees, approx. US \$3,500 per square kilometer (Walpole and Williams, 2001; Mbaria, 2001; Ottichilo, de Leeuw, and Prins, 2000; James, Gaston, and Balmford, 1999).

This amount is about twelve times greater than the amount needed for appropriate reserve management, however; the full sum of those funds never went to their intended purpose (Walpole and Williams 2001). This amount might have been collected but there is no record with the local or central Kenyan authorities (Mbaria, 2001; Ottichilo, de Leeuw, and Prins, 2000). The reserve is heavily damaged from uncontrolled tourism which is leading to significant loss of many wildlife species. Due to disturbance in the reserve by the tourist vehicles, the wildlife goes to search for undisturbed areas, or leaves the reserve. They often go to the nearby agriculture fields. This movement of wildlife leads to conflicts between local people and wildlife. Wildlife damages the crops and local people are victims of this movement of wildlife. Local people are not getting compensation, which was supposed to begin in 1990; this amount could be about US \$1 million (Walpole and William, 2001).

### **Problems in General**

Increasing human population, mobility, and participation in recreational activities have exerted pressure on finite resources of land and water almost everywhere in the world. This threatens not only nature but also the quality of recreation itself (Van der Zee, 1992). People want a closer view of wildlife. They also want to observe their behavior closely. The loss of natural vegetation in the park has been blamed on this increase in tourist numbers and mobility (Onyeanusi, 1986).

The field literature has not clearly delineated the affected areas with regards to where, when, and to what extent vegetation loss has occurred. It is important to make park management aware of this critical issue. Many such questions go unanswered in the Masai Mara. The impacts of vehicle noise and off road driving on soil, vegetation cover, and infiltration are still unknown (Bhandari, 1998).

Loss of wildlife habitat from both biophysical and socioeconomic impacts is an important problem in wildlife conservation. In the Masai Mara

National Reserve in the Narok district of Kenya the primary problems are related to the insufficient life support system and the secondary problems are related to the infrastructure of the area (Bhandari, 1998). Too much pressure on the park by tourists is a considerable problem for the reserve. High flow of tourists can be economically beneficial, but from the viewpoint of wildlife conservation this is not true (Said, 1993). The Reserve is surrounded to the north and east by the disperse area inhabited by the Masai. It is overcrowded by tourist cars, vans, minibuses, airplanes, balloons, and micro lights, because of the very high opportunity to see the wildlife (Kenyalogy Guide, 2003). The infrastructure development including roads within the reserve, hotels, resorts, and campsites have a negative impact on the wildlife habitat (Gakahu, 1992). Tourism has both positive and negative impacts (Figure 1).

The pressures have increased since the reserve was first established. From 1940 to 1950 onward, the relatively small human population was displaced from the reserve, but until recently, most reserves allowed the continuation of traditional human activities. There is now growing population pressure from agriculturists and livestock keepers around the park and in wildlife areas. The population growth in Kenya is relatively high (3.3% per year). Agriculture is increasing even in marginal areas that are part of the wildlife habitat. The dependency of these communities on resources is direct and immediate in the wildlife habitat. In their struggle for food and fuel the people often have little choice. At the same time, these people experience considerable damage to crops and livestock from wildlife. Tourist flow to Kenya is high and the main attractions for the tourists are national reserves (UNEP KWFT, 1988).

Human population in the Masai Mara area. was 0.8 per km<sup>2</sup> in 1950, 2.5 per km<sup>2</sup> in 1973, and 5 per per km<sup>2</sup> in 1984 and 14.7 per km<sup>2</sup> in 2002. Within three years from 1999 to 2002 the population increased significantly from 10.7 to 14.7 per per km<sup>2</sup>, respectively. In the reserve, population increased about 79%, or about 26% annual growth (Mara Count 2002).

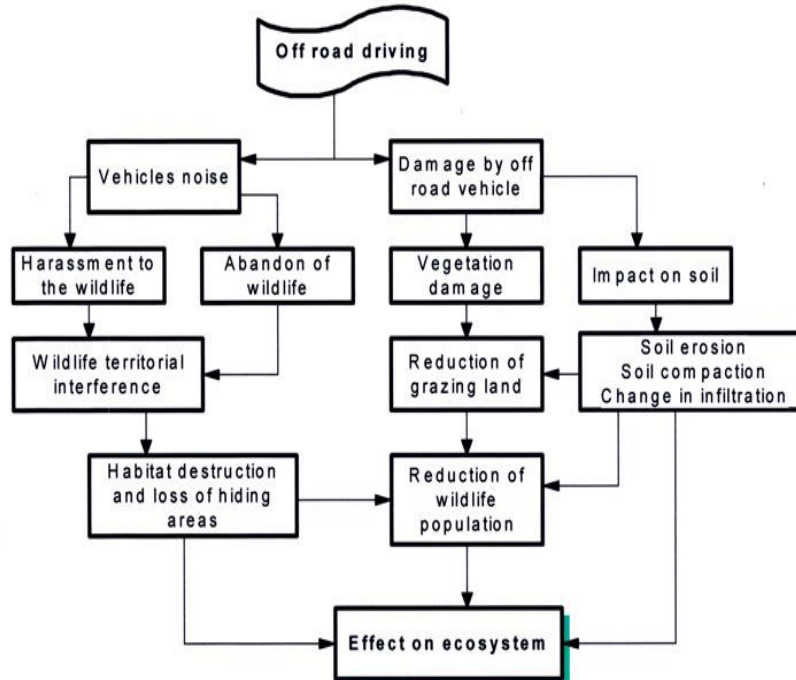
Around the Masai Mara National Reserve area, ranchers' and farmers' needs have not been adequately addressed despite the fact that wildlife often enters their land and destroys livestock, as well as using water and grazing land. To them,

wildlife is another competitor and an enemy that exploits ranch resources and threatens their personal survival. Wildlife in the group ranches is similar to other environmental catastrophes in such as drought. As a result, many ranchers have developed negative attitudes towards wildlife (Aboud, 1989).

Most of the protected areas have a history of human and wildlife conflict; conflict occurs between protected area authority and local people who are indigenous inhabitants of the protected area or its surroundings in the developing world. This land could be used for agriculture, grazing or water and timber/non-timber forest products. Land uses are also key issues at the beginning or during the period of park establishment. There are many cases of park and people conflict. In most of the developing world, local people are victims of wildlife and also the park authority. Major problems are crop damage by the wildlife, human injury or death. Additionally conflict occurs between park authority and local people regarding the use of the natural resources (Bhandari, 2000). Several studies have identified the key issues of the conflict and many park authorities of the developing world have started programs to address the issues. The Park and People Project of Nepal, India, Bangladesh and Sri Lanka, and revenue sharing programs of African countries, are examples of such programs. Kenya has long been working on this issue and the Masai Mara Reserve has a long history of revenue sharing with the local Masai people (Walpole *et al.*, 2003).

Similar conflicts exist in most of the protected areas in the developing world. The ways to solve the problem vary, though the focus is protection of the existing ecosystem and to honor the social, political, economic, and cultural aspects of the local inhabitants (Brechin, 2003). These are still leading issues. On one hand every day wildlife habitat is decreasing and natural resources for indigenous and local inhabitants are declining.

Walpole *et al.* (2003) identified three major human-wildlife conflicts in the Masai Mara Reserve. The first is the impact of tourism on the wildlife within the Reserve, the second is the impact of tourists and the local community on the endangered Black Rhinoceros population within the Reserve, and the third is the human-elephant conflict in the district beside the Reserve.



**Figure 1:** The Effects of ORD in the National Park.

### **Tourism Related Problems**

Tourism growth is difficult to control. Guiding development is a time-consuming process involving establishing policies, ongoing dialogue with stakeholders, and monitoring to determine if desired conditions are being met. Tourism activities require environmental impact assessments and carrying capacity studies. At sites with limited budgets and staff, increasing tourism can stretch scarce resources, taking managers away from protection efforts (UNESCO/MAB 2001).

Natural ecosystems are being threatened because of the increase in human population and improved facilities for travel, which enable more people to spend leisure time away from crowded urban areas. External tourist influence is higher than the internal and local tourists on the reserve (Onyeanus, 1986). Increasing population growth in the drier areas of Kenya has led to a pressure exceeding the carrying capacity of the land in relation to park management, which in turn has led to a lower income per capita, and even to famine around the park areas (World Bank, 1980). Many programs related to people's participation in natural resource management and wildlife management have been launched, but the degree of influence of tourism on park and reserves has

not been assessed. The influence of tourists on the reserve is increasing and off-road driving on the reserve is also increasing comparatively. Tourism is a source of foreign exchange so the tourist business is highly encouraged. The possible negative impact of tourists has not been assessed, particularly of tourists entering the park areas in motor vehicles. This tourist entry is suspected to disturb wild animals and damage natural vegetation by off road driving. The noise by the vehicles may also be disturbing to some wildlife (Skidmore and Leeuw, 1997).

Tourism can be a very destructive force environmentally and socially, when an area is subject to too much pressure, which leads to degradation and loss of attraction. Tourists from the developed countries want to see the culture of tribal and minority people of the developing world. During various field researches we have noted ambiguous reactions and feelings of intrusion and disturbance among the local people 'on show' (see flow chart 1) (field experiences). "Masai in Kenya who happen to live near the large safari parks believe that the influence of tourism on the Masai has not been positive or at least that the Masai have not benefited from the tourism as much as they could have. Often they are presented to foreign tourists as part of the safari package and "Model". Masai villages have



great numbers of tourists visiting to observe their lifestyle. Anthropologists would use the term Staged Authenticity for the idea that because one has traveled long distance, it is important to go and see something that is different, existing, exotic and remote” (Dr. Tim Forsyth, personal communications, 2005).

The impact of tourism can also lead to the violation of human rights, or it can lead to the displacement of people from their traditional homeland. The establishment of the Koshi Tappu Wildlife Reserve, Rara National Parks, and the extension of the Bardiya National Park of Nepal are examples (Nepal, 2001). There are many similar stories in other developing countries from South East Asia and from Africa. The potential economic benefits are not always achieved. The people living in and around the protected areas get very nominal economic benefits from tourism in the Masai Mara National Reserve. The percentage which goes to the local people from tourism in the area is less than two percent (Omandi *et al*, 2000).

The people living in and around the protected areas get very nominal economic benefits from tourism at the Masai Mara national Reserve (Omandi, 2000). The percentage which goes to the local people from tourism in the area is less than two percent. On the other hand, tourists are spending a lot of money to get there and all of the benefits go to the luxury hotels, lodges, transportation services, and the foreign package tour operators. Park entry fee is US\$27.00 per person which goes to the park authority or county councils. According to the Kenyan governmental policy at least 25% of the revenue from the reserve should go to the local people. However, in practice it is not the situation (Walpole and Williams, 2001; Mbaria, 2001; de Ottichilo, Leeuw, and Prins, 2000; James, Gaston, and Balmford, 1999).

Loss of biodiversity in protected areas is one of the major impacts of tourism. There has been no detailed study of biodiversity loss due to tourist pressure in the reserve. Damage of vegetation, soil compaction, the effect on infiltration, erosion and other parameters need to be analyzed to determine the extent of damage. The value of the ecosystem and its benefits ('ecosystem services') has not been calculated recently in economic

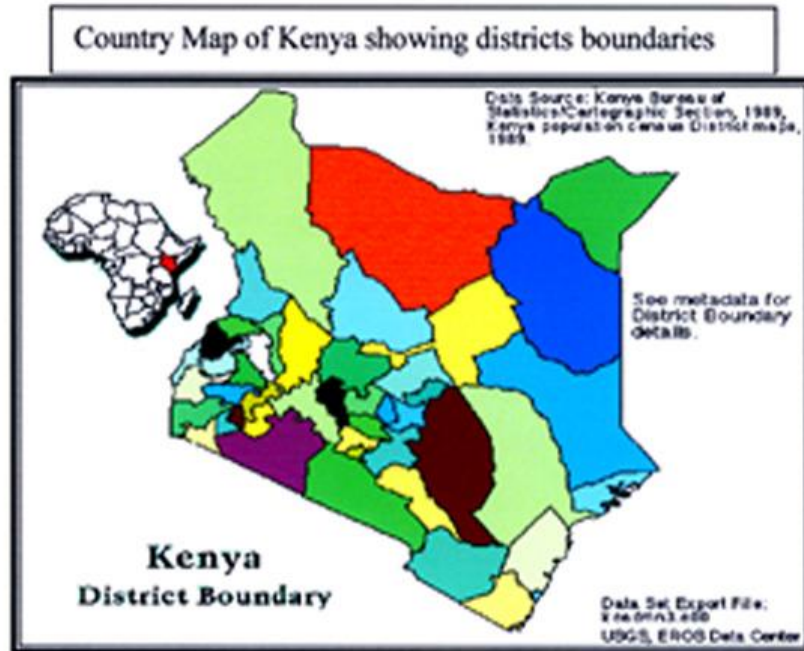
terms. Ten years ago Costanza *et al.* (1997) calculated that the 17 major ecosystem services were worth about US \$16.54 trillion per year. According to one of the working groups for the World Summit on Sustainable Development (WSSD 2002) an estimated 40% of the global economy is based on biological products and processes (WEHAB Working Group 2002).

Walpole *et al.* (2003), reported that the main impact of tourism is uncontrolled and uncontrollable off-road driving in the reserve. They found that off road driving increased by about 30% between 1991 and 1999. They studied the off road driving impacts on seven herbivores including the waterbuck, kongoni, impala, giraffe, zebra, warhog, and topi. All species displayed different responses to the off road vehicles, which were causing disturbance to the wildlife despite the existence of visitor regulations intended to prevent it.

Too many vehicles around animals (more than 5 at a viewing) and driving too close to the animals (closer than 20 meters) were the most frequently broken regulations. These were broken during 66 % of lion viewing events, and 57% of cheetah viewing events. The other most frequently broken regulations were visitors remaining too long when viewing animals (more than 10 minutes when other vehicles were waiting), and driving off road. These infringements occurred in 40% and 36% of lion viewing events, and 36% and 52% of cheetah viewing events (Walpole, Sitati and Leader-Williams, 2003).

### **Study Area**

The Masai Mara National Reserve lies 270 kilometers from Nairobi in the Narok district of south-western Kenya, bordering the Serengeti National Park on the Tanzania border (Figure 2). It lies between latitudes south and between longitudes east between: 1,500-2,170m Altitude. It forms the northern portion of the Serengeti Mara System that covers an area of 40,350 square kilometers (Burney, 1980), of which the Mara National Reserve comprises 1,673 square kilometers. There is no highway from the Kenyan capital. The access roads are better in the dry season than the wet season (Kenyalogy 2003).



**Figure 2:** Shows the Location of Kenya and Narok District of Kenya, where Masai Mara National Reserve is Located.

The Reserve is divided by the Mara River and surrounded by group ranches. It was established as a world heritage site in 1989, the main purpose being to protect the existing wildlife.

The topography of the reserve consists mostly of gently rolling to flat plains at 1000 meters elevation, surrounded by an escarpment and hills which range up to 2,290 meters in elevation. Within the reserve, microclimatic variation is noticeable due to the elevation. The metamorphosed sediments of the Basement System underlie large areas of the central and southern parts of the Narok district. The Nguruman escarpments, west of the Mara River, have exposed rocks of quartzite, gneisses, schist, amphibolites, migmatites, mylonites and pegmatites. Loita, the Siana Hills, and the hills around Lemek are dominated by quartzite rock derived from the original sandstones and grits.

The drainage is determined by the topographic conditions. The Mara ecosystem is drained in a south-eastern direction because it is sloping gently downward to the southwest from Lemek Hills. The Mara River originates from the Mau Hills flowing southwest through the foot slope of the Siana escarpment, south through the Mara

National Reserve, then turns west and discharges into Lake Victoria. All of the watercourses in the plains drain into the Mara River. The Sand River and the Talek, the largest tributaries of the Mara River, drain the National Reserve and Siana Plains. Most of the tributaries dry up during the dry season except the Mara and Talek Rivers (Omondi 1995).

The Mara ecosystem varies from grasslands and shrub-lands to wooded grasslands and shrubby and wooded riverine vegetation. "Pure" grassland communities are widely dominated by *Themeda triandra*, *Bothriochloa insculpta*, and *Setaria phleoides*, whereas the open grassland plains are dominated mostly by *T. triandra* (Onyeausi 1986). The central plains, where most of the wild herbivores graze, comprise short and tall as well as wooded grassland. The wooded grasslands that are mainly composed of *Balanites* to *T. triandra* are found primarily in the Mara triangle, which is located in the western part of the park. A shrubby grassland community is dominant within the Mara Reserve, the Loita Hills, and southern parts of the Koyaki Ranch.

Mara Count (2002) reveals the overall situation of the reserve. The study group counted forty-three wildlife and livestock species and mapped the Mara Ecosystem, recording land use, settlements, vegetation, burns, tsetse, infrastructure, and vehicles covering 2,212 square kilometers of reserve surrounding the Group Ranches in two dry seasons during 1999 and 2002. Their findings clearly show the pressures on the area, as shown by 373 settlements, 2,000 huts, 400,000 wildlife and livestock, 10 schools, four football pitches, 13 airstrips, 72 tourist lodges and camps, 7 veterinary dips, 10 cattle crushes, 69 shops, and 250 fresh animal carcasses in November, 2002.

Masai Mara Reserve is unique in its abundance of varieties of large wildlife, tourist flow, the standard of facilities and hotels in the parks and surrounding areas, and camping facilities. More than a million wildebeest and hundreds of thousands of zebras take the Masai Mara route in search of good grass. The migration of hundreds of thousands of wild animals is arguably the greatest event on earth, and it takes place through the Masai Mara National Reserve each year. Other herbivore wild animals follow the "greatest parade" followed by the carnivorous lions, hyenas, cheetahs, jackals and wild dogs.

"It is also famous for its other large mammals such as the Big Five made famous by safari hunting before it was closed in the 1960s. The Big Five did much to promote the Kenya tourist economy in the 1960s but today that mentality is reported to be doing more harm than good because of traffic jams . . . around prides of lions and other conflicts" (Walpole, Karanja, Sitati and Leader-Williams, 2003).

## METHODOLOGY

Research was mainly based on secondary data provided by the expert in Kenya and field research of 1998, 2000 and 2003. Remote sensing and geographical data are used from the previous article by Medini Bhandari in 2002, "Tourism raised problem on Masai Mara National Reserve, Narok Kenya", Mountain Forum online library and Walpole et al., 2003, "Wildlife and People: Conflict and Conservation in Masai Mara, Kenya" IIED, UK, and Mara Count 2002.

Requests for the data were posted to the mountain forum list serve and 25 responses were received. Requests were also published on the

weekly online journal Forest Information Update Vol. 6, No. 25, 20 June 2005, edited by Dr. H. Gyde Lund, Forest Information Services, USA and additional requests were posted at <http://home.comcast.net/~gyde/index.html> and on the forester's mailing list. Messages regarding the garbage problem within the national parks, protected areas, and zoos were also posted at the International Training Centre, Durrell Wildlife Preservation Trust, and the U.K. ITC-list serve. Feedback from all concerned people is incorporated in this research.

General tourist data flows from various years for Kenya and Masai Mara were obtained from the publications of the Central Bureau of Statistics of Kenya, Kenyalogy, Kenya Wildlife Service, and United Nation Environment Program.

## RESULTS AND DISCUSSION

### Tourist Flow and Its Effect on the Reserve

Amboseli and the Masai Mara reserves are dangerously unsustainable regarding wildlife conservation. The reason is shortsightedness and poor implementation policies. Due to unclear policies and deficiencies in the implementation process there is a conflict between conservation interests and the local people. The income from the tourists is not reaching those who actually suffer or those who have the right to the land (Cheeseman, 2003). Tourism in the Masai Mara Reserve has been extremely successful in economic terms.

Out of the 57 protected areas, which include inland and marine national parks and reserves, Masai Mara receives the highest number of visitors, not only in Kenya but in East Africa (Muthee, 1992). Available reports show that the average annual tourist entry into the park is around 200,000 (Gakahu, 1992). Development of tourist facilities in the reserve has been rapid in response to the increasing number of visitors. The first lodge, Kekorok, was established in 1963. In 1997, the number of permanent hotels had reached 25, excluding outside tented camps and temporary tented camps inside the reserve. However safari tourism enterprises and big hotels are mainly owned by the international-multinational corporations and firms from Western European and Indian interests. Very few Kenyans have a share in the big hotels and safari business. Kenya became independent from

Britain in 1963, but economic flow and industry could not become independent (Said 1993).

Increased tourist facilities have caused the loss of habitats 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 the people, including tourists. Another impact of garbage is that some scavengers, such as hyenas, may change their natural feeding habits and become permanent garbage feeders. Most of the rubbish is discarded by the tourists and by the local people, and is primarily concentrated at the road sites. About 75 percent of the garbage was concentrated at the Group Ranch area, and 25% was at the reserve (Mara Count 2002). Much human garbage, especially plastic bags, is very dangerous to the wildlife (Zoo Print, 1999, 2000).

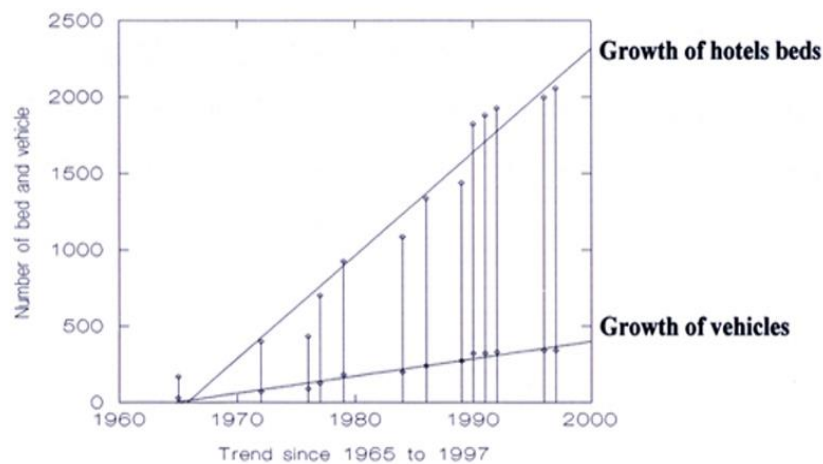
“We have had such incidences in the Lahore Zoo, Pakistan. The postmortem of giraffe that died in 1992 recovered 5kg of plastic bags. The animal had shown no sign of illness until it was too late. A few months back a Fellow Deer died and plastic bags were found in its gut. We have this problem of public feeding in the zoo, where people would

also throw away plastic bags with the food.” Uzma Khan, Project, Coordinator, World Wide Fund for Nature–Pakistan dated Thursday, July 7, 2005 5:43 AM.

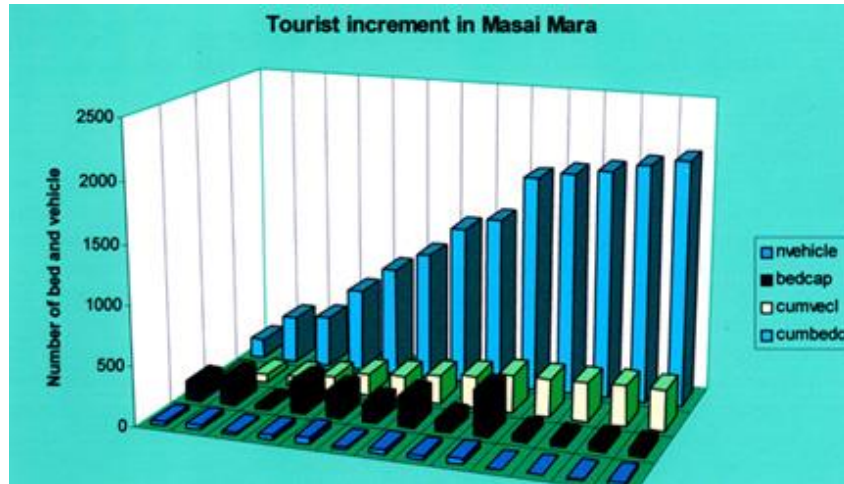
The problem of increasing visitors has led to an increase in the number of vehicle entries into the park (Figure 3). Its negative impact is likely to be higher in the long term (Bhandari 2000). The Masai Mara’s wildlife is at risk because of its own attractiveness. Too many tourist disturbances can lead to the decline of wildlife populations and in the long run the area could lose the wildlife and subsequently the tourism. When carrying capacity is exceeded, the pressure is dangerous to any protected or unprotected areas (Baraza Wangila, 2000).

### Hotels in the Park

The dramatic increase in visitors, vehicles, and visitors' accommodation has concerned many, especially the conservation community. Managing tourism impacts and assessing visitor capacity of the reserve has not been carried out (Henry, 1992, Walpole et al 2003). Figure 4, shows the trend in number of hotels and beds in the Masai Mara National Reserve from 1965 to 1997 and in 2000.



**Figure 3:** Increase in Hotels and Vehicles in Masai Mara.



**Figure 4:** Tourist and Vehicle increment in Masai Mara.

(Where, Cumbedc= Present hotel bed capacity; Cumvecl= No of vehicle present in hotels; bedcap= yearly bed growth; and nvehicle= yearly vehicle growth)

Figure 1 shows that hotels and vehicles are increasing in the reserve. In 1965 there was only one hotel, with bed capacity of 25 and two vehicles. Now the number of hotels has reached 25 and the bed capacity 2,057. Likewise, the number of vehicles is 339, which excludes the tented and safari camp outside the reserve. However, the tourist flow fluctuates. Every day many tourist vehicles enter the Masai Mara Reserve as well as the surroundings. Most of the vehicles go off-road for a closer view of the wildlife, which is two times greater than that of the Group Ranch in the area.

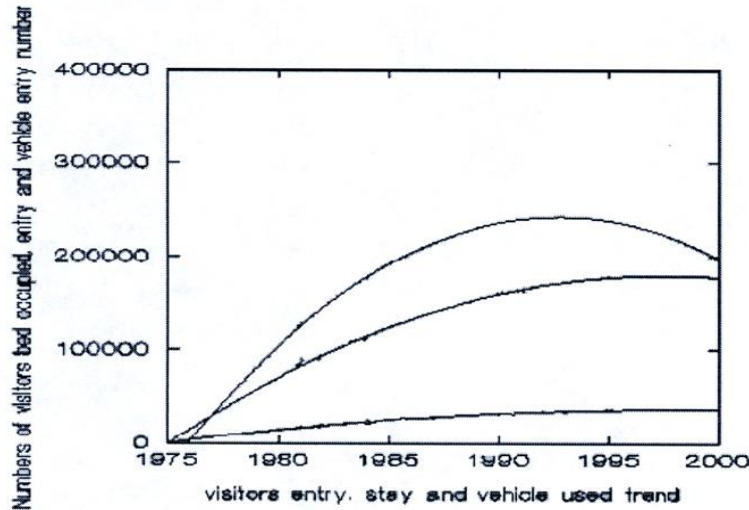
There are many lodges, hotels, and camps. Most of them are built close to the permanent water courses, excluding mobile tented camps. The number of infrastructures is also increasing. There were 72 tourist lodges and camps in and around the reserve and surrounding it are 10 schools and 4 football grounds. The Masai Mara area also contains 13 airstrips, 10 cattle crushes, 7 veterinary service centers, and 69 shops. In addition many small stalls sell beer and yamachoma (barbecued goat or other variety of fresh meat) (Mara Count 2002).

Figure 4 shows the increase in the hotels' bed capacity in and around the reserve. The first row of the figure shows the vehicle growth each year, the second row shows beds, the third row shows the total growth of vehicles, and the fourth row shows the overall growth of beds in the reserve.

The number of vehicles indicates those for game driving, which frequently drive off the road to show wild animals to the tourists. Apart from the above-mentioned number of vehicles many vehicles come every day directly from Nairobi and other places and return back.

#### **Tourist and Vehicle Entry in the Park**

Over the past decade, the recorded visitor entry to the Masai Mara National Reserve is increasing annually at 9%p.a. In 1980, the total visitor entry was 114,000, reaching 255,000 in 1990. An average visitor stays in the reserve for about 2.5 days. After 1990 the visitor entry rate is not constant every year, but the trend is not negative. As visitors increase the number of vehicles also increases, and the impact on the reserve is greater. In 1980, the number of vehicles entering was 17,160 and in 1990 the number of vehicles approximately doubled to 33,110. After 1991, due to external factors such as the Gulf War, fears of AIDS, terrorist attacks, and some other reasons the number of visitors fluctuated (Washilwa, 1996), but from 1995 onwards the flow is increasing. Permanent vehicles in the park (Figure 4) and external vehicles entering are often driven off the road. The problem of off road driving is increasing at the same rate of hotel beds and vehicles in the reserve (Figure 4). Tourist and vehicle flow is shown in Figure 5.



**Figure 5:** Tourist Entry Bed Occupancy and Vehicle use trend in the Masai Mara National Reserve. The top line of the graph shows the tourist bed occupancy, the middle line shows the tourist entry into the reserve, and the bottom line shows the tourist vehicles entry into the Masai Mara National Reserve.

Figure 5 shows the increasing trend in tourists arrived, tourists' length of stay, and vehicle entry. The trends are not uniform. However, the duration of tourists' length of stay is declining. The impacts on the big game wildlife are not.

### **Impact of Off Road driving (ORD)**

Off road vehicles are problematic and generate conflicts between other visitors and also harm the environment, forest, parks, trails, and waterways. The photographic survey, conducted by the research team of Minnesota, found the significant impact on forest, wildlife areas, and wetlands and labeled off road vehicle driving "all is not well" (Minnesotans for Responsible Recreation, December 1999). Michael Sawyer et al. (2005) found that off road vehicle have negative impacts to the protected areas. They found negative impacts on all wildlife, vegetation, birds, and even for various fish species.

Recreational off road driving have been found to be significantly harmful at the Brecon Beacons, Exmoor, Lake District, Northumberland, North York Moors, designated South Downs 1, and Yorkshire Dales National Parks in United Kingdom. Physical damage to the vegetation, conflict with the local people, as well as disturbances to the wildlife, landscape, and cultural settings are the common off road driving

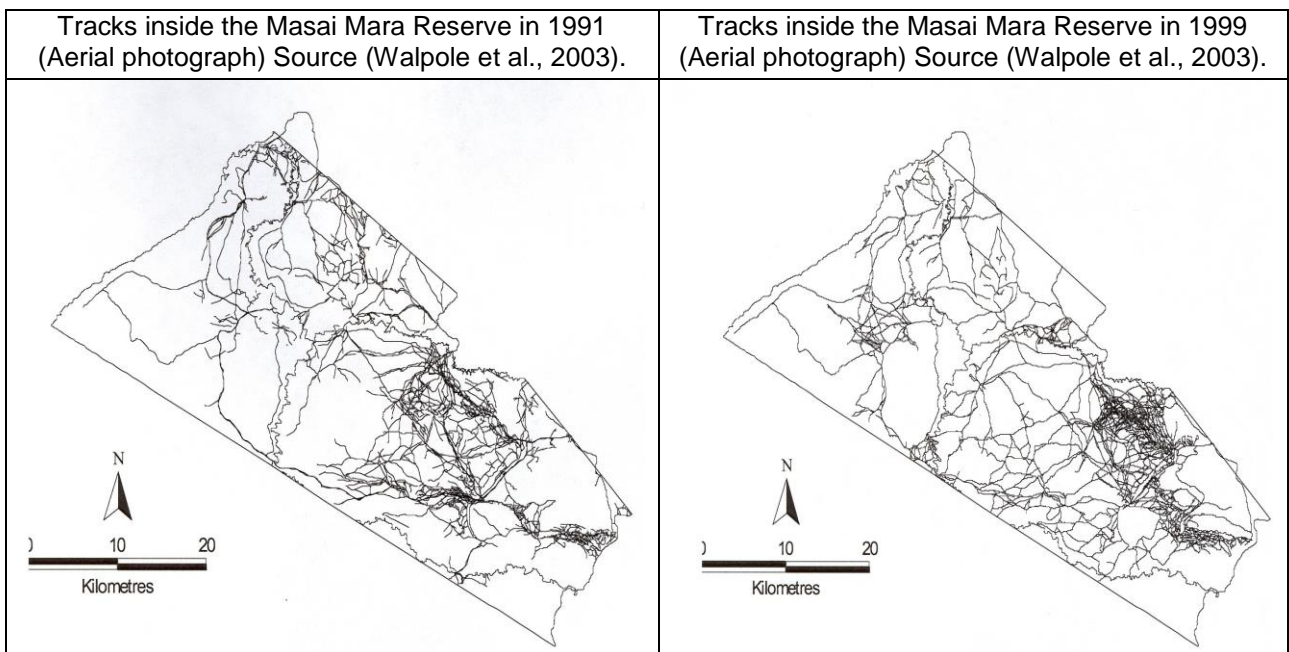
problems to the protected areas. Special rules have been set up to control the problem (RDNP 2005).

Most of the research team also found that off-road driving is a significant problem in the Masai Mara Reserve, which is affecting the habit and habitat of wildlife, and the presence of many hotels and lodges in and around the reserve are changing food intake of birds. They also saw baboon groups at the garbage site eating garbage. They also noticed the improper management of garbage, and saw damage to the vegetation due to the off road driving (Baraza Wangila, 2000, Bhandari 1998).

In the Masai Mara Reserve about 30 percent of the road and tracks increased from 1991 to 1999. Road and tracks cover was about nine square kilometers in 1999 which contains about five square kilometers of totally barren land due to the off road driving (Walpole et al., 2003). In 1991 there were approximately 189 square kilometers of roads in the Reserve which reached to approximately 223 square kilometers, and tracks increased 1,656 to 2,167 during the same period of time. Now the reserve's land is covered by the road networks about 4,300 kilometers in length at noticeable levels; however, there is a high chances of such situation existence in the area of bush and high grass cover.



Photos show the land damage by the off road vehicles. Photos by Medani Bhandari,



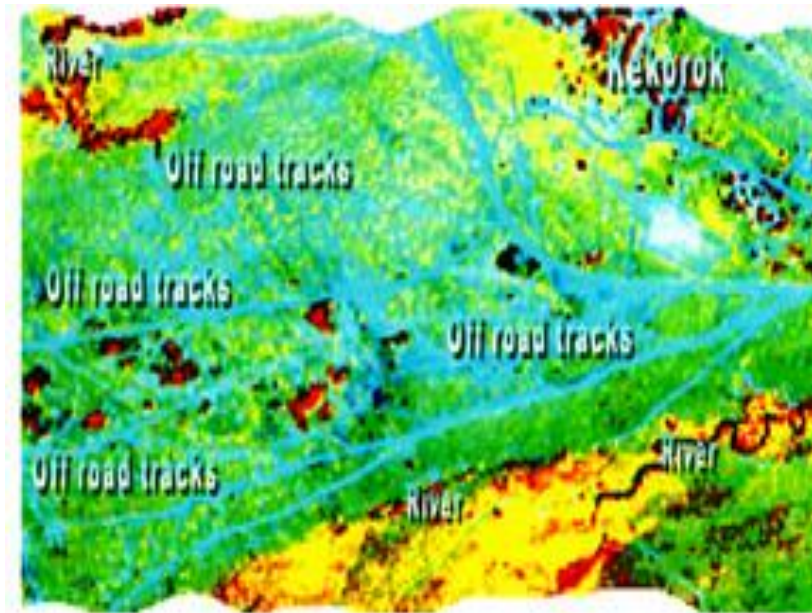
**Figures 6 and 7:** Show the Off-Road Tracks Increment in the Course of Ten Years.

Above maps, two and three were prepared using aerial photographs taken 1991 and 1999 respectively. These maps give the comparative view of the off road tracks increasing trend. These maps show a changing trend of off-road vehicle movement. The maps also reveal the density of off-road vehicle tracks increasing significantly to the eastern part of reserve in comparison to north-western part of the reserve.

**Off Road Driving Impact on Vegetation (Land Cover and Land Use)**

It was interesting to investigate whether the remotely sensed data could be used the Remote

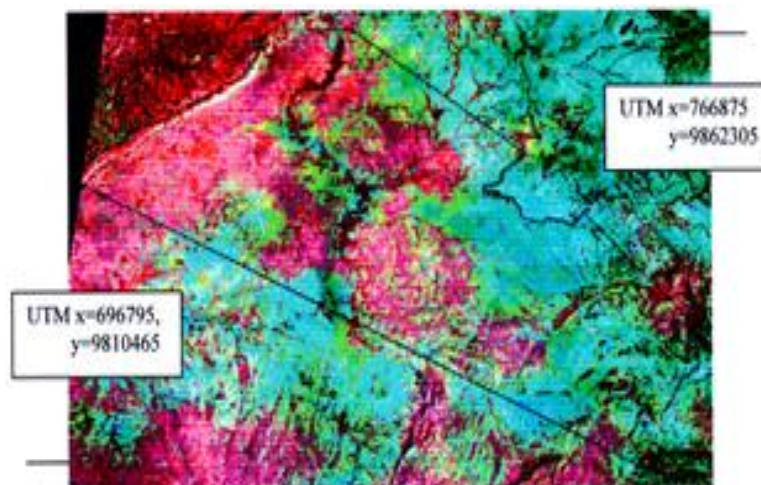
Sensing (RS) data to locate and prepare an Off-Road Driving (ORD) impact map. The analysis of Landsat satellite Thematic (TM) image showed the damaged areas of vegetation as well as bigger tracks more than 30 meters long and wide. It was also possible to visualize ORD track and the impact of ORD on Hyperspectral radar images and Aerial photos. However, Aerial photos and full coverage Hyperspectral radar images were not available to prepare the impact and track maps. Therefore, topographic maps, tourist maps, and Landsat TM image were used. Maps and images give the overview of the impact of ORD and the maps shows the present track density in the Masai Mara National Reserve.



**Figure 8:** Hyperspectral Radar Image of Kekorok Area in Masai Mara Nation Reserve. Image shows the ORD impact on the park where, Dark red area = forest, Yellow = bush land, Yellowish blue & green = grassland, Sky blue & white = Roads, tracks & bare areas.

This image one shows the main road and off road driving tracks in the park around the Kekorok side of the Masai Mara National reserve. It shows the main road from the Segenani gate to Kekorok and toward the Sand River. Apart from these two roads the image shows the off road driving tracks

in the reserve. The image also represents the density of the off-road tracks, vegetation damaged in the reserve, land cover and land use change and also gives the overview of the impact of off road driving in the reserve.



**Figure 9:** Landsat TM image (1995) of Masai Mara National Reserve. Where, Black rectangle = park boundary, Dark red = forest, Dark red in regular line with black spot = river & river side forest. White = dry bare soil (off road driving very much), Bluish green = bare and very short grass (off road driving high pressure) Light green & Del Grey = Short grass (off road driving).



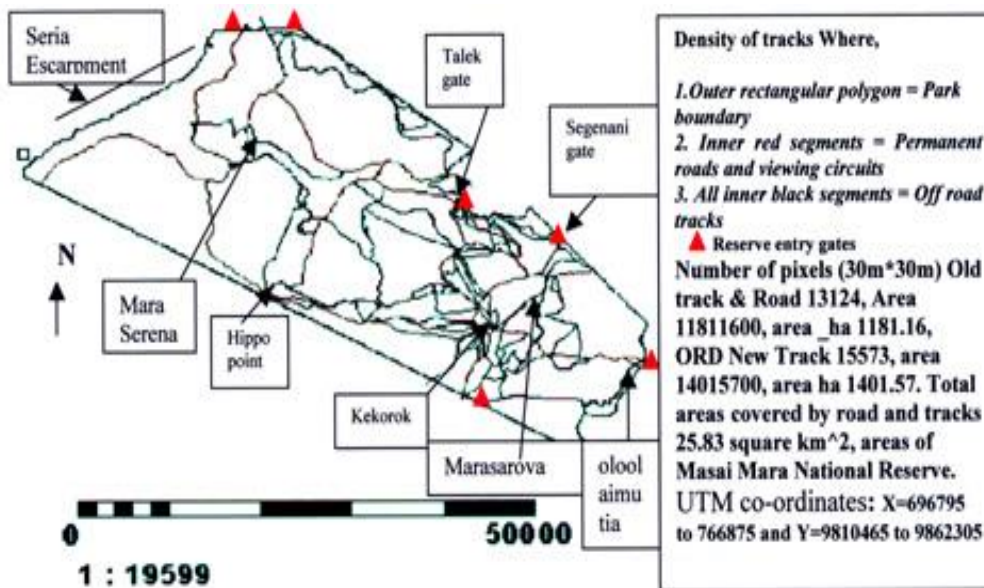
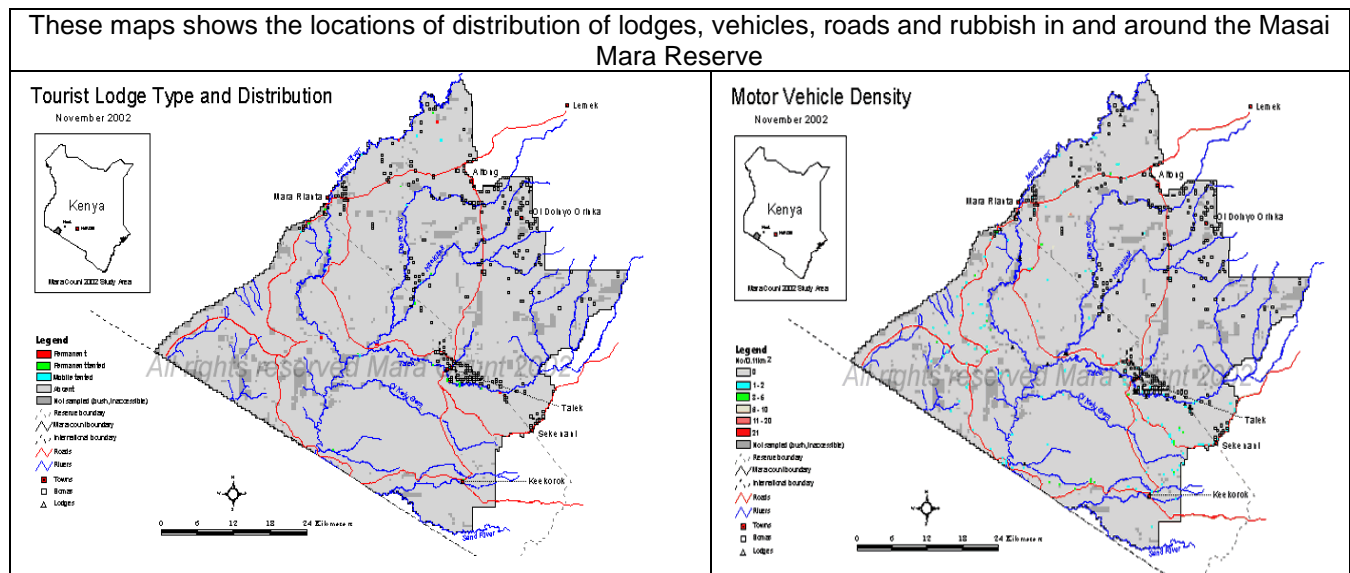
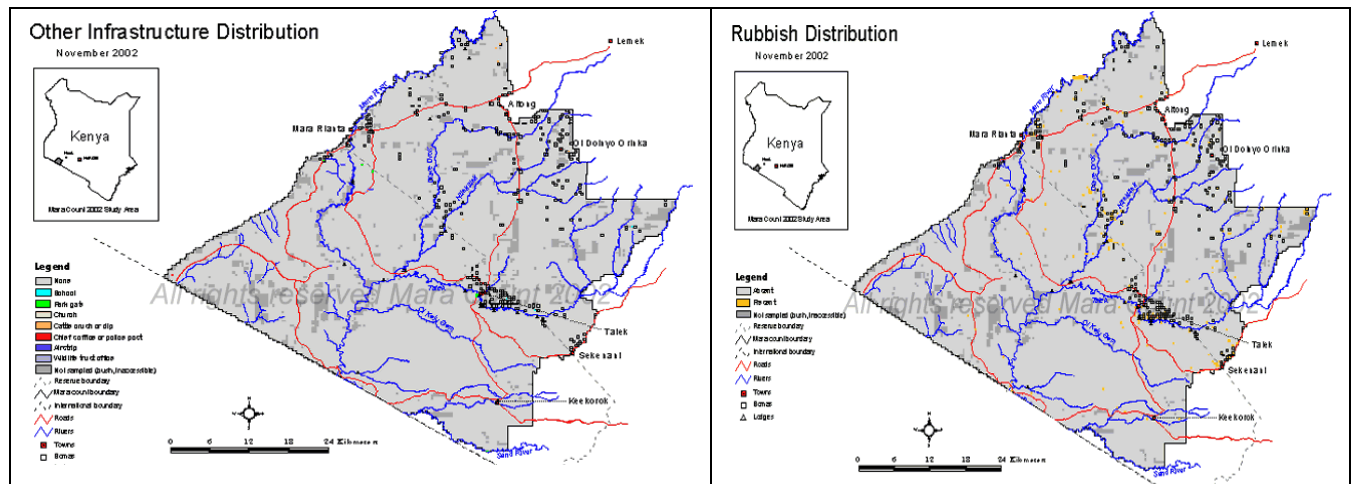


Figure 10: ORD Map is Based on the Recent Filed Data. Map Reveals the Damaged Locations.

Map four is based on the Landsat TM satellite image, topological maps, and tourist maps provided by Reserve. This map shows the track density in the park as well as general overview of

ORD impact on the reserve. Calculated map reveals road and off road tracks has covered 25.83 square kilometer land.





**Figure 11 (group):** Shows the Tourist Lodges, Tourist Vehicles, Infrastructure and Garbage Distribution inside and outside of the Masai Mara National Reserve, respectively.

There is no significant difference of wildlife distribution between the inside and outside mapped area. {Maps Source: Mara count 2002, International Livestock Research Institute (ILRI), Nairobi, Kenya (Above maps are used with the permission of ILRI-2005)}.

### Road and Tracks Distribution in the Reserve

The Masai Mara National Reserve has relatively very few gullies, rivers, and thick vegetation that could interfere with cross-country vehicle driving. As a result, drivers go off designated roads and tracks and criss-cross the grassland. Repeated off the road driving has resulted in a myriad of tracks with damage to vegetation and the naturalness of the area. There are very few roads and viewing circuits. C 12 is the tarmac up to 42 km from the main Sekenani Gate. The official main roads within a park are C12, C13, E176 and D301. The following are the five roads connecting different gates of the reserve:

- Narok - Segenani Gate (73km)
- Narok- Oloolaimtia (80km)
- Narok-Oloololo Gate (90km)
- Kilgoris- Oloololo (60km)
- Serengati - Sandriver (150km)

Likewise, officially accepted viewing circuits are as follows:

1. Segenani- Keekorok- Mara Bridge- Serena and Oloololo (95km)
2. Olemelepo- Talek- Musiara Gate (35 km)
3. Oloolaimutia- Keekorok-Sand River (130 km) the total is 260 km.

Only a very small area is separated where off the road driving is not allowed since 1989 and 1996, but in most of the area there is no restriction on off the road driving in the reserve. Mostly the three mentioned circuit areas are affected by the off road vehicles. The main off-road circuits and areas are as follows:

- a. Olemelepo- Talek- Keekorok- back (34 km)
- b. Keekorok- Segenani- Oloolaimutia and back (30 km)
- c. Intrepids- Olave Orok and back (64 km)
- d. Main Governors-Musiara Gate- Olave Orok and Back (90 km)
- e. Mara Serena- Ilpunyatta- Esankuriai (34 km)
- f. Mara Serena-Olpunyatta- Ngiro- Sand Lick and back (65 km)
- g. Roan Hill-Olmisigiyioi-Outlook-Mara Bridge-Keekorok (90 km)
- h. Mara Bridge- Saltlick- Mara Serena (65 km)
- i. Hill and back to Sarova (30 km)

The net has been produced by the track in Talek to Keekorok. Sometimes it is difficult to find an area that is not affected by ORD. Talek to Keekorok 260+502 =762 km off tracks are converting into permanent tracks and the average width of the tracks is five meters. In this way 3,810 square kilometers in area is completely damaged only on the Talek area the

ORD. In the field survey for this study, the areas were selected randomly. However 2,062 tracks with the total width of 1,601.49 (330.2272 hectors) was noted within a small area in comparison to

the whole park. Estimation made using GIS shows a total of 2,582.73 hectares of area is covered by the ORD tracks. Clearly, there is a problem of ORD within the park.



Off road driving tracks leading to soil erosion, Medani Bhandari measuring erosion gullies in the Masai Mara.

**Figure 12:** Shows the Intensity of Off-Road Tracks, which often leads to the Erosion as seen on the Photo.

### **Airstrips and Their Effects**

The existing road conditions of the Masai Mara are not good and some visitors prefer to travel via airplane to the reserve. Within the Masai Mara, including the area outside of the reserve, there are eight airstrips handled by hotels (information from warden office during fieldwork). The tourist flow via airplanes is eight to 10% of the total annual entry. In most of the cases, their safari vehicles are driven from Nairobi. These visitors do not prefer to be in-groups in safari and drive so that there are two to three persons using one vehicle. Off the road driving and high speed driving are very common with these passengers because they stay for a short period and they are eager to see many animals within the shortest possible time (information based on the interview).

There are thirteen airstrips within the Masai Mara and surroundings, and the area occupied for airstrips are noticeable. One airstrip for small aircrafts needs at least a 500 by 50 meters area to land and takeoff. One airstrip is equal to 2.5 hectors and eight to 20 hectors. The noise is more than 100 dB up to 100 meters around the runway during take off and landing (IIEE-1991). This may have affected wild animals within a significant

distance. More research is needed to find out the actual situation.

### **Stakeholders in Park Management**

Hingston first stated the importance of the reserve in 1931. He recognized it as an area designed to protect common plain game. In 1958, F. Fraser Darling stated again rating its importance when he carried out the first ecological reconnaissance of the Masai Mara area (Gakahu-1992).

Since its settlement, the Mara has been owned and managed by the Narok County Council. On the 4th of August 1994, the Trans-Mara District was created and this automatically paved the way for the establishment of the County Council of TransMara. Having had the Mara River as the natural boundary of the TransMara sub-district, the reserve lies between the two councils. The Mara triangle, an area of 690 square kilometers west of the Mara river is owned and managed by the TransMara County Council, while the east of the Mara river that includes both Kekorok and Musiara sectors, an area of 820 square

kilometers, is owned and managed by the Narok County council.

The Masai Mara is dually managed by the two councils that collect their revenues from tourists and lodges and camps from respective sides (Sindiyo-1996).

The following are the direct or indirect Stakeholders in the Park Management:

- Kenya Wildlife Service (KWS)
- Department of Resource Survey and Remote Sensing (DRSRS)
- Narok County Council
- TransMara County Council
- Park personnel (staff, management and security)
- Masai group ranches (peoples in the surroundings)
- Owner of hotels, safari, camp etc.
- Tourists

### **Park-People Interaction and Tourist Inflow**

Nature, culture, the environment, and development are closely related. Every manager seeks to ensure a balance among these processes. Nature and culture have history; they are the product of millions of years of Mother Nature's interaction with mankind. The customs, norms, behavior, and values of the society are clearly directed by nature. The cultural heritage of a society is based on nature. For instance Folklore includes the song of bravery of a hero who fought with the lion, elephant, and cheetah or of the lore of an individual that crossed the deadly area alone.

A tourist is interested in watching or feeling close to these inherent social phenomena and the wilderness of nature. She / He tends to admire the majestic landscape, wild flora and fauna, and cultural heritage and this consequently can have a positive influence on the domestic economy. A strong domestic economy is the backbone of a country. So, now many developing countries from the third world are after this process of tapping hard currency via tourism development.

There is a school of thought that believes in the world neighborhood theory and states that the world heritages are the property of the world

community, so everyone has an equal right to see and admire the beauty.

The above mentioned contradiction is also observed in the Masai Mara National Reserve and surrounding group ranches. The people look upon tourists as the principal source of foreign currency for the state. They are equally concerned with the negative impact tourism has rendered on wild animals and their cultural values.

A new concept in the field of tourism and nature conservation is eco-tourism. This is a practice of tourism without disturbing the nature or watching nature without disturbance. In the case of the Masai Mara tourists can travel by light vehicles. This has a two fold possible negative impacts. First, which is the concern of this study, is the impact of off road driving on the vegetation. The second impact is the frightening of wild animals by the noise and speed of the vehicles. Another important aspect, although not mentioned by the locals and park personnel, is the supremacy of the tourist. Tourists with nice vehicles give the impression to the locals that they are prosperous, rich, and powerful people. So to some extent the local people do not question what the tourists and property holders (like owners of hotels and camps) do and why they cause an impact especially by off-road driving.

Tourism brings some ethical questions. For instance, is it ethical to portray a human being as a stranger who possesses a unique culture, customs and tradition? Can a country exploit its scenic beauty, natural and cultural heritage in terms of pollution and over exposure in the name of tourism development?

The state of marvelousness, uniqueness, suspense, mystery, and thrill associated with nature will be wiped out as the same is more and more available to the world community by way of retrieval audio visual systems. The mystery of the Masai culture or the thrilling experience in seeing a lion in wilderness is gradually diminishing as it is being unraveled in front of the world community.

### **CONCLUSION**

The protection of nature and social justice are synonymous with one another. The protection of nature is an issue debated among politicians

rather than being singularly an issue of ecology. An ecological perspective is an essential element of environmental protection; however, it is recognized that protection of the environment is also a complex social issue. Conservation cannot succeed without spiritual, moral, and political guidance. Conservation most aspire for ethical virtue, if not than conservation will lose its essence (Brechin 1991, Brechin et al., 2002 and 2003).

Many visitors go to Kenya to see the wildlife, and the tourism industry is one of the main sources of foreign exchange in Kenya. There is a fluctuation of visitors' numbers since 1998 because of unwanted incidents in Nairobi, though it is still an important source of employment and foreign exchange in the country. There are 53 Natural Monuments, Species Management Seascapes (Categories III, IV, and V) tourist interest places in Kenya, out of them the Masai Mara National Reserve is well-known and the most visited one (IUCN).

The pressure on the Masai Mara is due to an abundance of all big five animals; the lion, cheetah, elephant, rhinoceros and wild buffaloes and other carnivore and herbivores such as hyenas, wildebeest, zebras, eland, topi, and different species of antelope and the Masai Mara ostrich as well as many other species. Another spectacle of the Masai Mara is the seasonal wildebeest migration from the Serengeti through the Masai area, which is one of the greatest events on Earth; millions of wildlife traveling at the same time followed by many predators. This brings many seasonal tourists to the Masai Mara Reserve.

We found that off-road tracks and roads are increasing 30% annually since 1991. Off road tracks are distributed everywhere. The damage can be seen in most of the accessible areas of the Reserve. We found that more than 25.83 square kilometers of grassland land is already converted to barren land. If controlled measures are not applied then there is a chance to cross the threshold of the area and ultimately the loss of both wildlife and tourists.

In this regard, we conclude that tourism in the Masai Mara National Reserve of Kenya has been extremely successful in economic terms. But expanded tourist facilities have caused the loss of wildlife habitat and naturalness of the area. The growing number of visitors has led to vehicle

entries in the park and off-road driving for closer view of wild animals.

In the course of this study, quantitative assessments of the impact of tourism and off-road driving were conducted in the Reserve. Remote sensing and GIS techniques were used to locate the ORD track and to prepare the ORD impact map.

The surrounding people and the park management are aware of the impacts of tourist flow and Off Road Driving in the reserve as well as in the ranches. More than 75 percent of the interviewed people confirmed the findings of this study. In general, their opinion is that quick measures should be taken to check the decrease in ecological conditions and disturbances to the wildlife of the reserve.

## RECOMMENDATIONS

The most important priority for the biodiversity conservation movement should be to place more importance on enforced legislation that would allow for the protection of wildlife, their habitats, and the entire world environment (Brechin et al., 2002).

Tourism is one of the main sources of foreign exchange in Kenya, which is also providing substantial benefits to the government and to the general public including employment and business. However, due to extreme pressure of tourists in a particular site, such as in the Masai Mara, natural habitats of wildlife are being degraded. To overcome the problem policies need to be formulated and need to be implemented.

The Kenyan Government needs to study the tourist behavior and needs to develop new policies which can develop new visions for the tourism industry which can increase visitor numbers to the other parks as well. Effective management of the protected areas needs more local participation (Brechin et al., 1991). Officially, the Masai Mara reserve is managed by the two county councils and by the Kenya Wildlife Services. In order to maintain, protect, and ultimately save the Masai Mara National Reserve stringent legislation is essential.

"Do and don't do" rules are there and can be found at the entry gates of the Masai Mara, but it is very hard to see these regulations followed by

any tourist or safari operators or by the reserve authority. Exiting rules need to be implemented by the park authority and county councils.

There are no good viewing circuits in the area. In absence of alternative circuits, the game driver has to look for a suitable alternate way of passing through (Bhandari, 1998). As a solution to this problem, development of good viewing circuits could help improve better conditions if applied together with other measures effectively.

Entries of vehicles inside the reserve should be regulated and controlled. Heavy vehicles should not be allowed for game drives.

To control the mushrooming of new hotels and camps, which is an important factor in determining the magnitude of ORD effects, issuing new licenses for new hotels and camps in the park should be restricted.

There is a need to create awareness about the impact of ORD on the park among the game drivers to protect ORD in new areas in the park.

Provisions for litter disposal should be made available throughout the reserve.

Taking peoples' opinions under consideration should be a priority for the reserve management, and they should take the necessary steps to involve them in the decision making process (so the prevailing problem of ORD is under control).

#### NEEDS FOR FURTHER STUDY

- How ORD is affecting soil micro characteristics and exactly how long does it takes to improve?
- How much ORD and human interference has influenced the wildlife habitat?
- What would be a sustainable tourist 'load' for alert management scenarios?

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## ABOUT THE AUTHOR

**Dr. Bhandari** is interested in teaching and mentoring in the fields community and economic development; environmental studies; sustainability studies; and peace, diplomacy and international relations. His main interest as a teacher and researcher centers on the intersection of local and global interests (trans-society/trans-border) and capacities in addressing global political economy, green economy, natural resource management challenges, environmental sustainability, and the effects of climate change. He is also interested in risk analysis, public policies, and behaviors that contribute to the goal of catalyzing action across the global community, increase public awareness and change public attitudes on global climate change; natural resource governance issues, human rights abuse, sustainable development and environmental degradation. His goal is to utilize scientific and cultural knowledge, research skills, and extensive experiences to help address the challenges of global environmental change, the green economy, and sustainability.