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# Benefits of Protected Areas to Adjacent Communities: The Case of Maasai Mara National Reserve In Kenya

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## ABSTRACT

Kenya has ratified several Multilateral Environmental Agreements (MEAs) such as the Convention on Biological Diversity (CBD) and International Trade in Endangered Species of Flora and Fauna (CITES) and they all emphasize promotion of human well-being - through equitable sharing of benefits accruing from such conservation and protection schemes. This paper is aimed at showing whether the communities living around Kenya's premier conservation area, Maasai Mara National Reserve (MMNR), receive any benefits. A sample of 198 respondents was selected randomly from villages around the MMNR. Data were collected using questionnaires, observations and interviews and analysed by the aid of descriptive and inferential statistics. The results show that majority of the respondents (68.2%) benefit from the Reserve. The largest proportion of those who received benefits (53%) was within 1-2 km range from the Reserve. The benefits mainly included income diversification and access to education. The study recommends equitable sharing of benefits between the Narok County and the surrounding communities to enhance sustainable conservation of wildlife. The neighbouring private and communal lands provide habitats for migratory species whose survival depends on well-being of the local communities. Active engagement of local communities in the conservation of wildlife is, therefore, crucial. This study is part of a larger study on domestication of MEAs in Kenya.

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## 1. Introduction

Protected areas have been established so as to retain ecological spots, conserve species and wildlife habitats and retain spiritual and cultural values.

With protection of biodiversity, there are both tangible and intangible benefits to local communities, regions and countries. Protected areas directly and indirectly contribute to creation of job opportunities, improvement of income, access to education and health services. They also provide environmental services such as clean air, water, aesthetic beauty, and relaxation opportunities [1, 2].

An estimated 14% of the land territory globally is under the protected area status [3]. People's understanding on the importance of biodiversity conservation has become of value since the report of the World Commission on Environment and Development (Brundtland Commission), the Earth Summit in Rio de Janeiro in 1992, and the Convention of Biological Diversity (CBD) in 1992 [4]. At the Conference of Parties (CoP) 7, it was agreed to set up and maintain "comprehensive, effectively managed and ecologically representative systems of protected areas" which would minimize biodiversity loss [5]. In addition, the World Parks Congress emphasized that the world should have at least 10% of the land area under protected areas status for *in-situ* protection. In 2003, at the Fifth World Parks Congress, the achievement of the 10% protected areas was celebrated as the world surpassed this figure [1].

In Kenya, about 8% of the land area is under wildlife protection with 0.5% as marine protected areas [6]. This is substantial when compared with other countries such as South Africa (6.1%), Mauritius (3.3%), Egypt (5.6%), South Korea (3.6%) and India (5.3%) but inferior when compared to its East African counterparts of Tanzania (42.4%), Uganda (32.6%) and the rest of the developing countries like Zambia (40%), Botswana (30.9%) and Malaysia (30.7%) [7]. Kenya's policy on the link between protected areas and local communities has undergone changes. In the 1970s, protected areas were simply designed to conserve biodiversity and it was expected that there would be indirect benefits in terms of infrastructural development around the protected areas, such as development of schools and water supply. However, in the 1990s there was a paradigm shift to making the local communities part and parcel of conservation efforts and benefit sharing.

Kenya is one of the countries that has ratified the CBD whose objectives are conservation of biological diversity, sustainable use of the components of biological diversity, and fair and equitable sharing of the benefits arising out of the utilization of genetic resources (CBD Article 1). Protected areas are charged with improving social welfare, guarding local security and providing economic benefits across multiple scales, whose objectives traditionally related to the development sector [8]. The majority of Kenya's protected areas are found in Arid and Semi-Arid Lands (ASALs) where pastoral and agro-pastoral activities dominate and productivity is often low due to the vagaries of weather. Equitable sharing of benefits from biodiversity conservation is seen as one way of improving the wellbeing of populations and encouraging communities to provide space for wildlife. If the communities are involved in conservation efforts, then only will the mechanism of protected areas be sustainable [8]. At the same time, the country's Vision 2030 is geared towards the protection of the country's natural resources which supports wildlife and tourism activities [9].

Currently the tourism sector is the second largest foreign exchange earner for the country next to agriculture [9]. In 2014, the country earned KShs 561. 8 billion from this sector [10]. At the same time, it provided 543,500 direct and indirect jobs in the sector [10].

The Maasai Mara National Reserve (MMNR) is one of the premier conservation areas in Kenya. The Reserve is widely recognised as the "Jewel in the Crown" of Kenya's protected area system. Recognised as the Eighth Wonder of the World, the Reserve is a major cultural heritage of the Maasai People, whose cultural practices and traditions have over the years helped to ensure the survival of wildlife throughout the Greater Mara Ecosystem. Every year millions of wildebeest, gazelles and zebras migrate into the Reserve from Serengeti in the neighbouring Tanzania. Every year about 50 percent of the tourists that visit Kenya go to the Reserve contributing to the much needed foreign exchange earnings as well as stimulating local socio-economic development through the purchase of local products and souvenirs [11]. In 2014, the entry fees for the MMNR brought in KShs 3 billion [12]. It is important to understand that the MMNR is not managed by the Kenya Wildlife Service as the case of other protected areas in the country like the Lake Nakuru National Park and the Nairobi National Park. The MMNR is managed by the Narok County which collects all the revenues and uses it for the benefit of the county residents.

The study used the Ecosystem Approach which is a strategy for the integrated management of land, water and living resources that promote conservation and sustainable use in an equitable manner [13]. This approach was developed at the 5th CoP meeting of the CBD and involves all relevant sectors of society. The whole concept is to reduce negative consequences on land, water and living beings and integrate conservation, sustainable use of biodiversity and the fair and equitable sharing of benefits so as to sustain ecosystem functions. The stakeholders, especially communities, should benefit from the functions of the ecosystem [13].

The ecosystem approach is aimed at contributing towards sustainable ecosystem management and improving the livelihoods of communities living around protected areas who are part and parcel of the ecosystem. This approach encourages the sustainable interaction of people and biodiversity. With the communities benefitting from the MMNR, it is envisaged that they will develop positive attitudes towards the protection of biodiversity. Conservation will in turn provide benefits to the communities around the protected areas. This is achieved through Communication, Education and Public Awareness (CEPA) which has potential to bring long term benefits to the local communities and to the ecosystem [13]. The success of this approach is seen in terms of recovery of species, improvement in the wildlife counts and achieving Sustainable Development Goals (SDGs) like eradication of poverty. An example where this has been successfully implemented is in the Amboseli National Park [14].

The aim of the study was to (1) show whether the communities benefited from the MMNR, (2) identify the types of the benefits and, (3) whether and how the benefits are related to distance from the MMNR. The study hypothesised that there was no difference between the benefits one received, and distance one lived, from the MMNR.

2. Materials and Methods

Study Site

The MMNR is in the Narok County and west of the Rift Valley, and lies between longitudes 34°45' and 35°25' East and latitudes 1°13' and 1°45' South (Figure 1). MMNR was established in 1948 as the Maasai Mara Game Reserve. The MMNR is part of the larger Serengeti-Mara ecosystem which includes the Serengeti National Park and Ngorongoro Conservation Area in Tanzania. The Serengeti-Mara Ecosystem covers 25,000 km<sup>2</sup> [15]. Contiguous state-protected areas form the bulk of this area, including the Maasai Mara National Reserve (Kenya), Serengeti National Park, Ikorongo Game Reserve, Maswa Game Reserve, Gurumeti Game Reserve, and Ngorongoro Conservation Area (Tanzania).

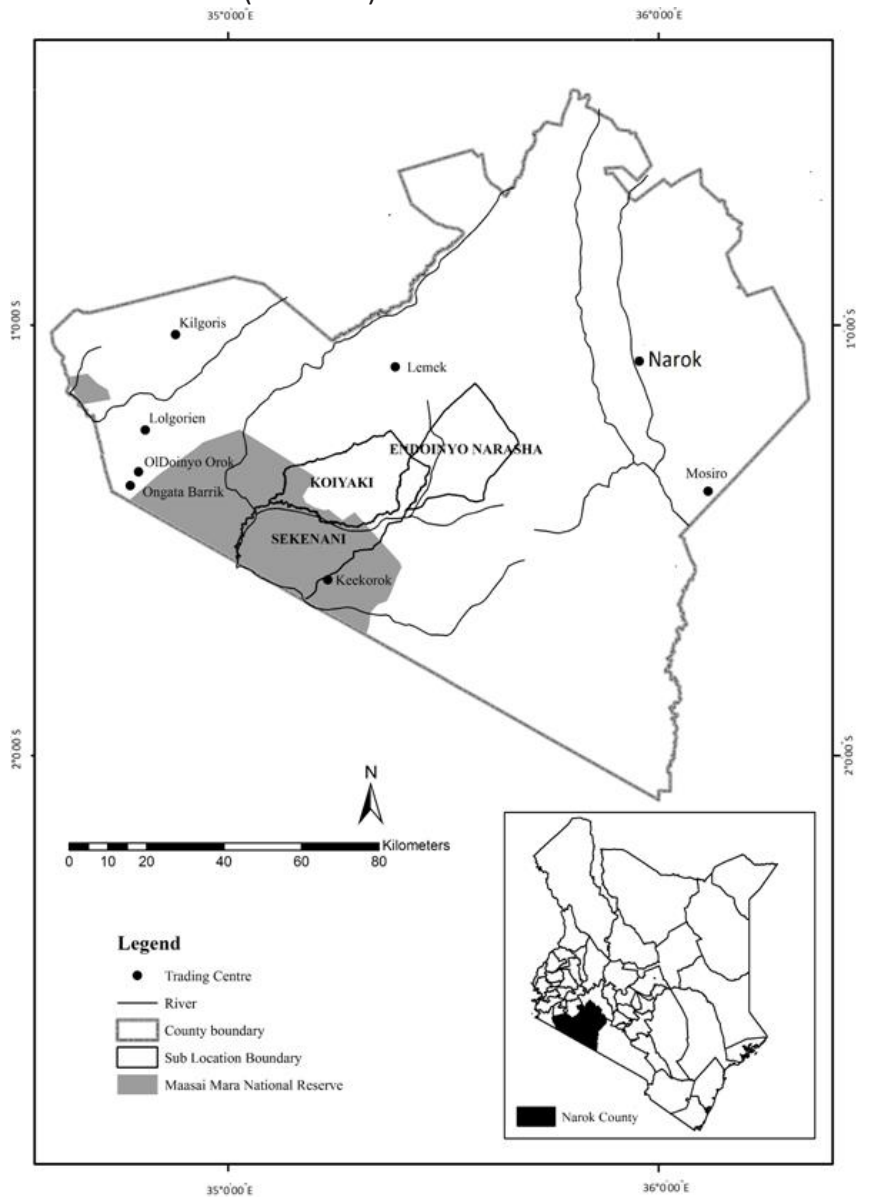


Figure 1: Maasai Mara National Reserve and surrounding areas (source: authors)

The Kenyan side of the Maasai Mara ecosystem lies at a mean altitude of 1600m and covers approximately 6,500 km<sup>2</sup>, out of which 25% is MMNR and 75% is unprotected land occupied by both the Maasai and other agro-pastoral communities [16].

The rainfall is bimodal with the long rains occurring between April and May and the short rains occurring between December and January. The mean annual rainfall is 1015 mm [16]. Daily maximum temperatures range between 26°C and 30°C while minimum temperatures range between 12°C and 14°C [17]. The MMNR is unfenced and joins community conservancies (the buffer zone) to the north, east and west and the Serengeti National Park in Tanzania to the south. The main vegetation comprises of *Themeda triandra*, *Setaria sphacelata*, *Acacia drepanolobium*, *Penisetum mezianum*, *Sporobolus pyramidalis*, *Acacia brevispica*, *Dichrostachys cinerea*, *Croton dichogamus* and *Indigofera spinosa* [18, 19].

The Maasai Mara ecosystem has some of the richest species of wildlife in the world as well as the largest collection of wildlife species in Kenya [20]. The Serengeti-Mara ecosystem is very famous for the wildebeest migration across the Mara River every year, making it to be considered as the eighth wonder of the world. At the same time, the MMNR is one of the rare terrestrial places on the earth with large mammal populations [20]. It supports approximately 237 herbivores per km<sup>2</sup>. The MMNR also has a large carnivore population which helps it balance the food chain of the high number of herbivores and these include the lions, cheetahs, jackals and the hyenas. It is also a very important bird zone with 452 bird species [20].

### **Sampling, Data Collection and Analysis**

Primary data were sourced using questionnaires, observations, informal interviews and photographs. A total of 198 respondents were randomly selected using the hat method from two locations namely Koiyaki and Ol Kinyei as they were close to the MMNR and accessible. Two sub-locations were selected from Koiyaki location namely; Sekanani and Koiyaki while in Ol Kinyei, Endoinyo and Narasha sub-locations were selected. In both the locations, the number of males was high (Table 1) due to cultural practices which prevent females from talking to strangers. In Sekanani sub-location, interviews were conducted in three villages namely Olai Mutiai, Ole Kikoror and Ol Okuaion. In Koiyaki sub-location, the interviews were conducted in four villages namely Ole Kasoi, Olo Loint, Ole Seike and Dipili Kwani. In both Sekanani and Koiyaki sub-locations, the selected villages were more than one as each village had more children than the adults. In Endoinyo Narasha sub-location all the respondents were from the village of Il Turillshow as it had more adults so one village was enough to get the respondents.

Table 1: The sampling components around MMNR

County	Division	Location	Sub-location	Total population		House Holds	No. of units in the sample (%)		No. of respondents (%)
				M	F		M	F	
Narok	Mara	Koiyaki	Sekanani	1681	1513	706	47 (68.1)	22 (31.9)	69 (34.8)
Narok	Mara	Ol Kinyei	Endoinyo Narasha	2042	2227	896	50 (79.4)	13 (20.6)	63 (31.8)
Narok	Mara	Koiyaki	Koiyaki	2994	2503	1170	60 (90.9)	6 (9.1)	66 (33.4)
Total	1	3	3	6717	6243	2772	157 (79.3)	41 (20.7)	198 (100)

Data source: KNBS, 2009 [21]

The study used both descriptive and inferential statistics. The primary data comprised of the nature of benefits received, distance one lived from the MMNR and the intensity of the benefits in relation to the distance from the MMNR.

### 3. Results and Discussion

The respondents comprised of 79.3% (157) males and 20.7% (41) females. In terms of the gender composition, there were 29.9% (47) males from the Sekanani Sub-location, 31.8% (50) from Endoinyo Narasha Sub-location and 38.3% (60) from Koiyaki Sub-location while there were 53.7% (22) females from the Sekanani Sub-location, 31.7% (13) from Endoinyo Narasha Sub-location and 14.6% (6) from Koiyaki Sub-location. The respondents were asked whether or not they benefited from the MMNR. The results indicate that 68.2% benefited while 31.8% did not.

In terms of the distance from the MMNR, there were four categories namely 0-1 km, 1-2 km, 2-3 km and over 3 km. The results indicate that for those who benefited, 12% lived in the distance of 0-1 km, 53% in the distance of 1-2 km, only 3% in the distance of 2-3 km and 32% in the distance of over 3 km (Figure 2).

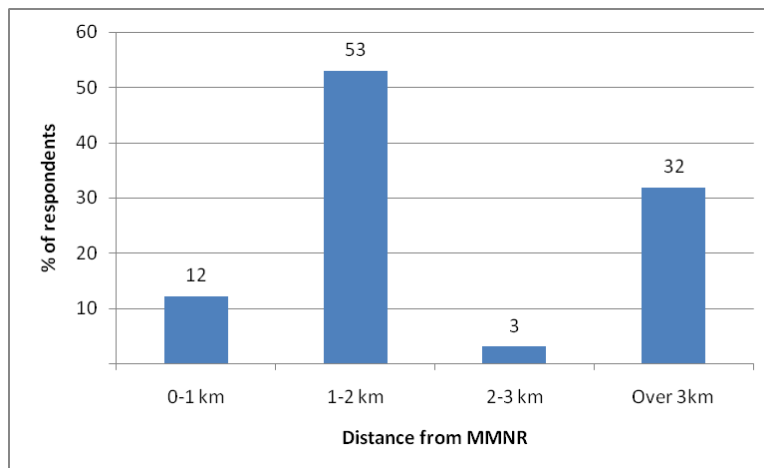


Figure 2: Respondents who received benefits according to distance from MMNR (source: field survey)

Those living at a distance less than 1 km from the MMNR were very few because there was a lot of wildlife in this area and therefore a high likelihood of human-wildlife conflicts. The distance of 1-2 km is the buffer zone between MMNR and private and communal lands that have now been converted into conservancies. The zone of 2-3 km had very few inhabitants and this zone was mainly dominated by core conservation areas of the conservancies. The population in the distance of over 3 km was also quite high as the area was beginning to experience the effect of urbanization from nearby settlements.

Benefits were in terms of income and jobs, poverty reduction, education and physiological needs which included food, fuel wood and water (Figure 3). Poverty reduction refers to a successful improvement of livelihoods and is often referred to as poverty alleviation [20]. According to the perception of the local communities, poverty reduction was equated with improved access to social services and income through jobs created by the existence of MMNR.

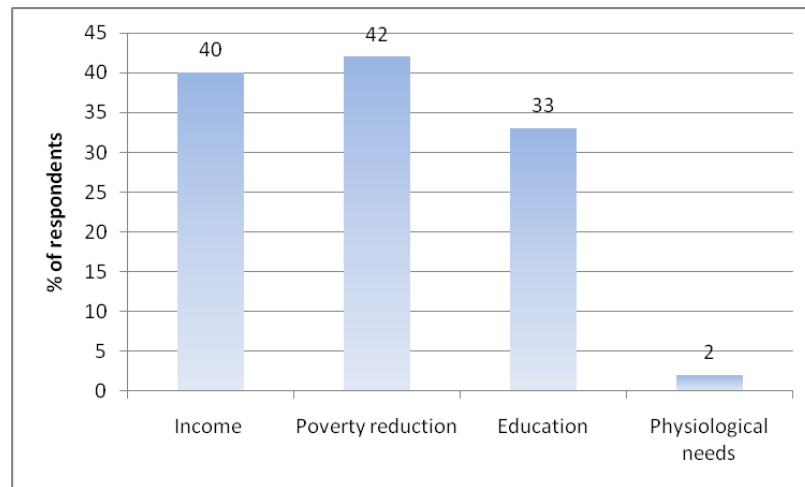


Figure 3: Benefits of the MMNR to the surrounding communities. NB: The respondents gave multiple responses on the benefits obtained. (source: field survey)

The study observed that the common types of benefits were poverty reduction and incomes and jobs. Physiological benefits which included food, fuel wood and water brought in the least benefits to the communities around the MMNR (Figure 3).

The benefits were further fragmented according to their classification as many selected more than one benefit. Frequency distribution was done to show how the categories of different benefits were spread over the four distance zones (Figure 4).

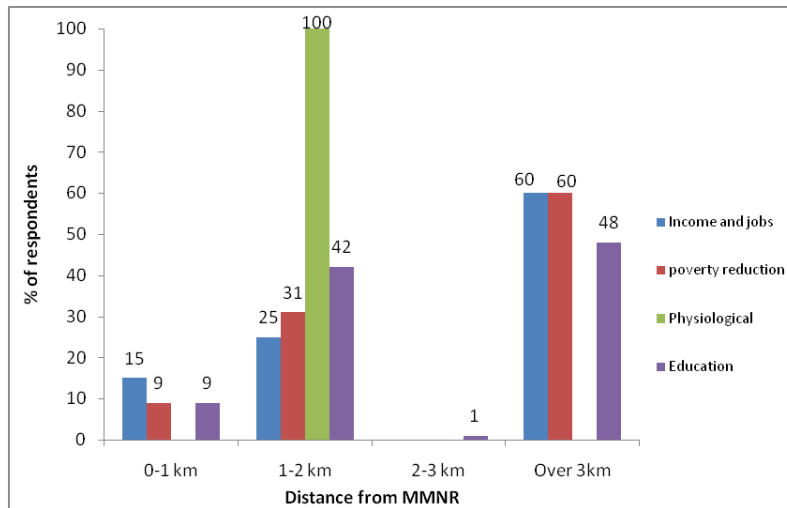


Figure 4: Categories of benefits in relation to distance from the MMNR (source: field survey)

The respondents from villages within the 1-2 km distance from MMNR enjoyed more benefits from all the four categories, followed by those in over 3 km zones. This was because these areas had the greatest number of respondents as in the zone of 1-2 km, there were 105 respondents; in the zone of over 3 km there were 63 respondents; in the zone of 0-1 km, there were 24 and in the zone of 2-3 km there were only 6 respondents. The benefits to those who lived in the 0-1 km distance from the Reserve were much less because these areas hardly had settlers.

The chi-square was used to test the null hypothesis that there was no difference between distance and benefits. The results indicate that the calculated value is 18.477 at the degree of freedom being 3 and the critical value is 7.82 at the confidence level of 95%, thus we fail to accept the null hypothesis that there was no difference between distance and benefits (Table 2). This indicates that distance from the Reserve affected benefits.

Table 1: Results of the Chi-square test showing the difference between distance and benefits.

	Value	df
Pearson Chi-square	18.477	3
Likelihood Ratio	18.831	3
Linear-by-Linear Association	4.852	1
N of Valid Cases	198	

The findings of this research showed that for the MMNR, the level of benefits were all direct and were increasing with distance from the MMNR.



The trend indicates that incomes and jobs, less poverty, and educational levels of communities were increasing away from the MMNR. Physiological improvements were found only in the zone of 1-2 km.

This research has shown that the local communities have appreciated the fact that their incomes have improved. Coincidentally this trend is increasing away from the MMNR. This can be explained by the fact that most people are now living further away from the MMNR due to the setup of conservancies near the MMNR and also to avoid human-wildlife conflicts which are very common as these communities are pastoralists. In terms of jobs, there are more tertiary institutions in the proximity of the MMNR which are providing training in tourism related services and this is helping the communities to get jobs like tour guides, drivers, revenue collecting officers at the gates of the MMNR, and cooks in the lodges in the MMNR. These jobs also bring in a lot of other benefits which are through development of skills and also increased access to information, credit and markets [20]. Research has shown that communities living around Bwindi Impenetrable Forest and Lake Mburo National Park in Uganda and the Amboro National Park in Bolivia also benefit by offering services to the tourism industry [22,31]. At the same time, the communities living further away from the distance of 1km from the MMNR are able to take care of their cattle as there is more access to grazing land around the outskirts of the MMNR. In addition, through better marketing and extension awareness created by the Ministry of Agriculture Livestock and Fisheries the pastoralists are now selling their cattle to the lodges in the MMNR for meat. At the same time, indigenous communities living around the MMNR are also encouraged to participate in craft making through ecotourism and they sell their ware to the tourists, thus boosting their income.

Physiological benefits indicated by communities around the MMNR in the distance of 1-2 km are similar to those reported for the local communities in Annapurna Community Reserve of Nepal, where they have access to fresh water and food [23]. The provision of water has enabled them to grow their own subsistence food thereby diversifying their livelihoods. Another example is of Kenya's neighbor Uganda where around the Lake Mburo National Park (a Category II protected area), 44% of respondents who lived within 3 km of the park stated that the major benefit of staying around the protected area was the provision of water as well as grass for their cattle [22].

Research has shown that around protected areas, indigenous communities are being encouraged to generate income by engaging themselves in tourism-related jobs such as tour drivers, guides, and providing craft-based items which create sustainability in the long term [20, 22, and 23]. Likewise, the local communities around the Kwazulu Natal National Park in South Africa are also benefitting in a similar way where they collect levies from the visitors for development and economic activities around the park [24, 25]. The communities have been experiencing an increase in other benefits which provide diverse options for incomes as well as jobs within the area like in conservancies. Another study carried out by Vodohuê *et al.* in 2010 [26] in Benin's Pendjari National Park indicates that the most common benefit to the local communities right from the park boundaries and beyond was provision of tourism services and

education. Community members were engaged in jobs such as tour guiding and provision of security to tourists and wildlife [26].

In the distance of 1-2 km of the MMNR, the local communities are also benefiting from water and fuel wood. Similar benefits were obtained by communities living around the Jaú National Park in Brazil [27]. The same was also found around the Pendjari National Park in Benin where 93% of the respondents stated that they used the park to obtain medicinal plants and 57% indicated that they used it for ceremonies [26].

In Zimbabwe the concept of integrated conservation and development programmes like the CAMPFIRE has taken root [28] while in Botswana, community trusts formed since 1995 around the Okavango Delta obtain quotas on hunting which they often sell to tourist companies [29]. Some of these trusts are the Chobe Enclave Conservation Trust and Okavango Community Trust (OCT). The OCT and the Okavango Kopano Mokoro Community Trust are engaged in tourism activities where they lease their Controlled Hunting Areas and sell wildlife quotas to safari companies and encourage cultural tourism [28]. In 2001 for instance, the OCT got a revenue of US\$ 250,000 and it employed one hundred and eighty people through direct and indirect employment [29]. In the whole of the Okavango Delta, the total employment through the Community Based Natural Resource Management (CBNRM) in 2001 was eight hundred and thirty-two people [28]. All these indicate that where there are benefits from protected areas, the local communities also begin to conserve the biodiversity as there is a two-way benefit – benefits to the communities and protection of biodiversity.

Despite the many benefits that communities around protected areas receive, there are examples where there are no benefits adjacent to these areas [29]. In fact, instead of benefits, there are conflicts between the lead institutions in-charge of these conservation sites and the local communities. This has made the communities hate the idea of protected areas as they see them more as problems rather than a source of benefit [29].

#### **4. Conclusion and Recommendations**

Overall this research has shown that on average, the benefits to the local community from the MMNR are diverse but limited. This is quite common around the protected areas in many developing countries. This is because these protected areas are designated as “protected” by the government thus contributing to restricted access especially in terms of natural resources use by the local communities. It is expected that in protected areas whose management is decentralised to local level like MMNR, the benefits to the residents of Narok County should be more. However, this has not been the case given that the revenue collected has to meet many other development goals. Further, the communities living around the reserve bear the cost of human-wildlife conflicts which degrades the nature of benefits from the conservancy.

The conservation can only be sustainable if they also enjoy tangible benefits. Most of the benefits observed by this study were indirect such as investment in education, but there were also some direct benefits such as access to job opportunities. Better mechanisms need to be put in place so as to ensure provision of more benefits to the communities.

These mechanisms include involvement of communities in decision making, clearly allocated property rights, benefits sharing through management structures, formation of CBOs, access to social services, and biodiversity awareness creation programmes.

In order for the local communities to get the maximum benefits, there should be the principle of equitable sharing of benefits which is already put across in the ecosystem approach. The Narok County must share the revenue equally with the local communities so that the people respect the wealth of the MMNR and protect it for sustainable development.

More research is needed to assess benefits according to age and gender. It would be also interesting to study the community perception on human – wildlife conflicts around the reserve and whether this affects conservation in any way.

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