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Socio-Economic Benefits of Wildlife Conservation Relative to Distance from Maasai Mara National Reserve, Narok County, Kenya

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Abstract: This paper assessed the relative influence of distance from protected areas on the distribution of the socio-economic benefits derived from conservation areas to the local communities. The local people living adjacent to the protected areas are expected to have high interactions with wildlife which in most cases it turns out to be negative co-existence, because of the high interruption caused to the local community's livelihood networks. Further, closer to protected areas wildlife economic costs are felt at high intensity as compared to the community living further away from a protected area. Distributive justice requires that, the adjacent community should receive the greatest reward commensurate to the economic costs they face through mechanisms such as compensation. This paper, therefore, focuses on whether socio-economic benefits varied with distance from Maasai Mara National Reserve (MMNR) in the Maasai Mara Ecosystem. This study used Mixed Methods concurrent design and that the study area was stratified into 17 sublocations. Subjects within the strata were sampled through systematic random sampling. The main data collection tools were questionnaires, structured interviews and Focused Group Discussions (FGDs). The findings revealed that 62 % of the respondents were males, 40.8 % being majority were of age 38-47 years and 65 % were pastoralists. Further, the findings indicated that there were socio-economic benefits derived from the MMNR ($r = -.180$, $df = 284$, $p = 0.002$) and since $p < 0.01$, it revealed that socio-economic benefits vary significantly with distance from MMNR. The study concluded that, there are socio-economic benefits accruing from MMNR but the model used in resources distribution seemed inequitable. The study then recommends that; the County Government of Narok should enhance the 19% policy on compensation to 35% in order to equitably cover most of the deserving cases and that the establishments within the MMNR (hotels and camps) should consider partnering with the local community especially in trade.

Keywords: Wildlife Conservation, Socio-Economic Benefits, Distributive Justice

1. Introduction

Maasai Mara National Reserve is predominantly found within the area surrounded by the Maasai community who are pastoralists [20]. The reserve is located within their ancestral land and the adjacent areas where they live, therefore, also act as dispersal areas for wildlife from the MMNR. This brings about stiff competition for resources between the locals and wildlife. The surrounding community still have dilapidated infrastructure in terms of road network, water supply, telecommunication network and access to credit facilities [26]. This happens when the expected sharing of the revenue generated from conservation efforts should be visible and thereby enhance a cordial relationship between the local people and the wildlife authorities in accessing sustainable livelihoods for the locals and ensuring appropriate and self-driven wildlife conservation efforts by the adjacent community in case, they experience the benefits.

2. Literature Review

2.1. Wildlife Conservation and Conservation Benefits

Over the years, biodiversity conservation has continuously gained great connections to the socio-economic well-being of the local communities [33]. This notwithstanding, in 2014, WWF published a piece of alarming information on the dwindling wildlife population due to habitat destruction, poaching, pollution and climate change [44]. In Central America, for instance, which is home to some world's richest concentration of biodiversity, wildlife species face threats due to the conversion of protected areas into agricultural lands, illegal cattle ranching, human-wildlife conflicts, poaching and wildlife trafficking [41]. Some 80% of protected areas of South America have indigenous people living within them and the presence of parks and protected areas are considered to threaten livelihood development [29].

In the US, on drier ground, a study conducted by the United States Fish and Wildlife Service found that birdwatchers contribute $32 billion annually to the US economy, and safaris in Kenya generate close to $1 billion in annual revenue [39]. The most thorough study conducted into the financial impact of nature-based tourism has found Africa's 8,400 Protected Areas are generating $48 billion in direct in-country expenditure and that Tourism drives 8.5% of Africa's economy and supports 24 million jobs [40]. By 2030, visitors could more than double to 134m people [44].

2.2. Sustainability of Wildlife Conservation

For sustainable management and protection of biodiversity, a sense of belonging needs to be instilled in the local community, which in turn will increase the level of participation and create the right perception of the whole concept of conservation [1]. In Namibia, the development of the CBNRM program makes an ideal connection between conservation and socio-economic development [33]. This program was taken in the form of jobs that could improve households as well as other benefits-sharing programs, which include community projects [33]. Conceptually CBRNM is a sound idea and seems to encourage the livelihoods of poor rural livelihoods through the proceeds of wildlife activities [28].

The socio-economic benefits to the community are a key component of conservation and wildlife development [22, 27]. GeAnge Imanishimwe [8] views ICDPs as one of the major solutions to human-wildlife conflicts which creates a win-win situation. In Zimbabwe, CAMPFIRE was implemented to give the locals in the communal areas a strong impact on the management and protection of wildlife resources [13, 18]. From the CAMPFIRE program, the community would get part of the proceeds for wildlife conservation which are distributed to them as cash transfers [28]. This was in support of the fifth wave of conservation which emphasized the innate tendency of growth and development both economically and socio-culturally alive to the fact that economically empowered communities protect their resources [7]. Herbert Ntuli [10], further contends that a community that derives benefits from wildlife conservation has adequate incentives to conserve wildlife.

Most Kenya's Protected Areas (PAs) are found in arid and semi-arid lands where pastoralists and agropastoral live and productivity is often low due to weather challenges [32, 36]. Like most sub-Saharan African countries, poverty and lack of alternative livelihood and subsistence hamper effective conservation of wildlife in most of these areas. The majority of the local people around Maasai Mara benefit from the proceeds of MMNR, but there seems to be lack of equitable sharing of the benefits by the Narok County government, which is the custodian of the wildlife resources to the surrounding communities, which could compromise sustainable conservation of wildlife [36, 43]. The concept of an egalitarian approach [22], would be helpful in the community around MMNR, where all people are viewed to deserve equal rights and opportunities to the benefits as opposed to a few elite individuals benefiting at the expense of those who bear the brunt of conserving wildlife [28].

2.3. Livelihoods and Wildlife Conservation

Of importance to note is that livelihood is the greatest of all challenges to communities, households, and individuals and is about food, money, labor, employment and asset [29]. Riehl *et al.,* [33] contends that household could benefit from the investment made at the community level, like improved schools leading to improved educational opportunities and improved health infrastructure resulting in enhanced health treatment. Protected areas directly or indirectly contribute to the creation of job opportunities, improvement of income, access to education and health services, as well as providing environmental services such as clean air, water, aesthetic beauty and relaxation opportunities [36].

However, these benefits/revenues channeled to the community may not create an impact on the livelihoods of the community's people as long as participation remains a questionable issue [30, 35, 37]. Further, successful project outputs do not necessarily result in successful outcomes [5]. Crystal and Courtney [5] argues that without steps to ensure these outcomes are realized, community projects may be more beneficial for tourism marketing than for the neighboring residents.

It is worth noting that conservation areas have been generating incomes that in many regions, it has been reported that their main objective was to support conservation programs that enhance local community's livelihood systems. Most local communities have been noted to be depended on activities related to wildlife conservation, which during low seasons have not been enough to sustain livelihoods. It has also been noted that PAs, generate revenues that come as either direct or indirect benefits to the local community. However, challenges have been noted in the sharing of these resources where, in many cases, it has been reported to be unjust and inequitable. It is expected that, the people living closer to PAs owing to high disruption of livelihoods, should be compensated the most. This clarity has not been achieved and this study intended to show clarity in the way benefit-sharing varied with distance from the PAs.

2.4. Conceptual Framework

2.4.1. Social Exchange Theory

This theory is based on the elements of reward and its value, cost, profit and equity and distributive justice. The current study relied on the postulation of Homans [11]. Homans [11] observed that exchange is social in nature. He further noted that social exchange is the exchange of activity, tangible or intangible, or more or less rewarding or costly, between at least two groups (actors). The more valuable to a man a unit of the activity another gives him, the more often he will emit activity rewarded by the activity of the other. Cost conceived as the activity forgone and behavior change is also greatest when perceived profit is least [11].

Reward and the value of the reward, costs, profit (reward minus costs), equity and distributive justice are the main elements of the Social exchange theory [11]. According to Redmond [31], the social behavior of actors often involves social exchanges when people are motivated to attain some valued reward for which they must forfeit something of value (cost).

This study is informed by this theory that conservation and livelihood development at least must strike an equilibrium by actors in order to for both to be sustainable. The socio-economic benefits like employment, access to food, shelter, and health services are the benefits the pastoralist get as a reward from the conservation of wildlife in Maasai Mara National Reserve. The reward obtained is as a result of foregoing their grazing land for the conservation of wild animals. Consequently, the pastoralist bears the brunt of conservation which in this study are the economic costs which include livestock depredation, human and livestock diseases (zoonotic), crop damage, accidents, fear of wildlife roaming in homesteads and their grazing land. In this case, pastoralists may be willing to continue bearing the cost of conservation as long as the rewards emanating from conservation are greater than the costs they meet.

Studies have also shown that the costs are greater to a protected area than the contrary. In which case, the local people closer to the MMNR, according to the principle of equity and distributive justice, would be the ones receiving the greatest reward owing to the greatest costs they receive from wildlife conservation. Their livelihood networks are highly disrupted than the people living a distant far from the MMNR. Homans [11] postulated that if the cost of members of one group is higher than those of another, distributive justice requires that their rewards should also be higher, for if the rewards are higher, the costs are higher too. The quest for pastoralists to continue supporting conservation initiatives is pegged on the great profit they derive from MMNR when they receive a great reward, and in reciprocation, they participate and support initiatives towards sustainable conservation and management of wildlife.

2.4.2. Sustainable Livelihood Approach

According to Kollimer and St. Gamper [19], livelihood thinking dates back to the Robert Chambers in the themed-1980s, when he developed the idea of sustainable livelihood with the intention to enhance the efficiency of development cooperation. Veldes-rodriques [42] noted that the concept of sustainable livelihood is people-centered, holistic, dynamic, building strengths, linking macro-micro levels and sustainable.

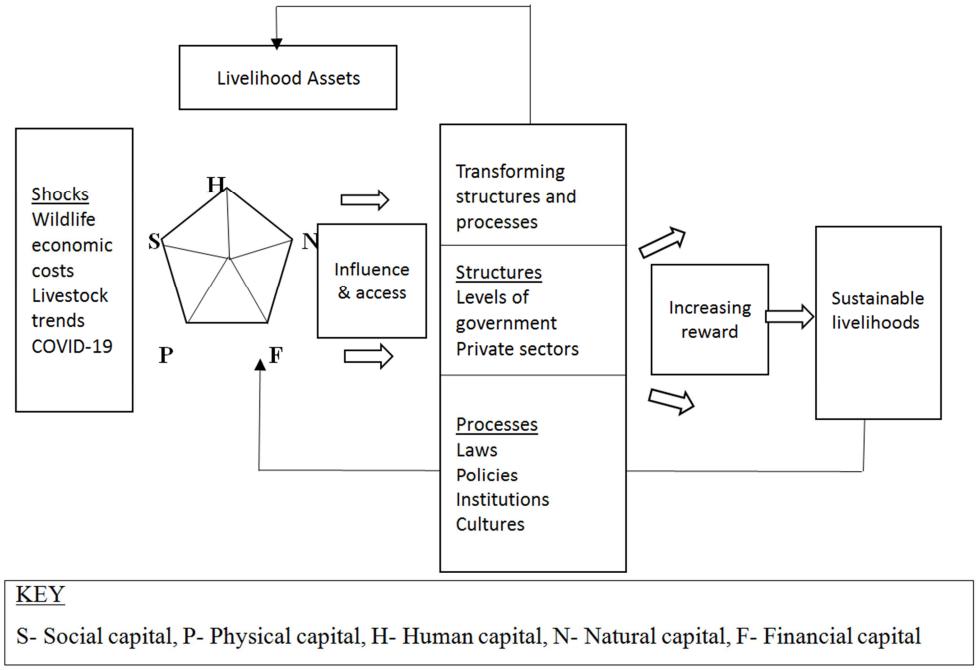
Kollimer and St. Gamper [19] further observe that the sustainable livelihood Framework (SLF) forms the core of sustainable livelihood approach. Livelihood, as defined by Robert [34] as, "comprise the capabilities, assets (stores, resources, claims and access) and activities required for means of living; a livelihood is sustainable when it can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets and provide sustainable livelihood opportunities for the next generation; and contribute net benefit to other livelihoods at the local and global levels and in the short and long term."

The framework depicts stakeholders as operating in a context of vulnerability within which they have access to certain assets [19, 21, 42]. The vulnerability may include trends in population, resources and governance. Shocks include human, livestock or crop health shocks, natural hazards like floods or earthquakes, economic shocks and conflicts -civil or external wars [24].

There is also seasonality regarding prices of commodities/goods or employment opportunities. The pastoralist of the Maasai Mara Ecosystem may be vulnerable because of the disruptions to their livelihood systems occasioned by the presence of wildlife in their land and manifest in the form of economic costs like zoonotic diseases, livestock depredation, deaths of people and livestock, among others. Employment, livestock prices and governance (creation of policies) opportunities may also be seasonal.

These are likely to influence livelihood assets like- Human capital representing the skills, knowledge (local knowledge in the case of conservation), ability to work and good health. Social capital includes networks and connections to formalized groups. Natural capital is like wildlife resources, land, water, forest, air quality and other forms in which resources (goods) and services flow. Physical capital includes basic infrastructure and producers of goods needed to support livelihoods like affordable transport, secure shelter and buildings, adequate water supply, sanitation, clean, affordable energy and access to information. Financial capital includes cash and its equivalents like available stocks of cash, bank deposits or liquid assets like livestock. It also entails regular flows of money in the form of labor income, pensions or better transfers from the state and remittances (cash transfers to the elderly and the needy in society/group).

In this case, the strategy leading to a sustainable livelihood outcome entails one that there are in place favorable policies, good governance and strong institutional arrangements that facilitate rewards to the local community (pastoralist) to enhance capacity to deal with wildlife economic costs. It requires a robust adaptive mechanism so as to enable pastoralists facing losses to recover from the shocks. Figure 1 connect with these studies showing the interaction of variables toward sustainable wildlife conservation and livelihood development.

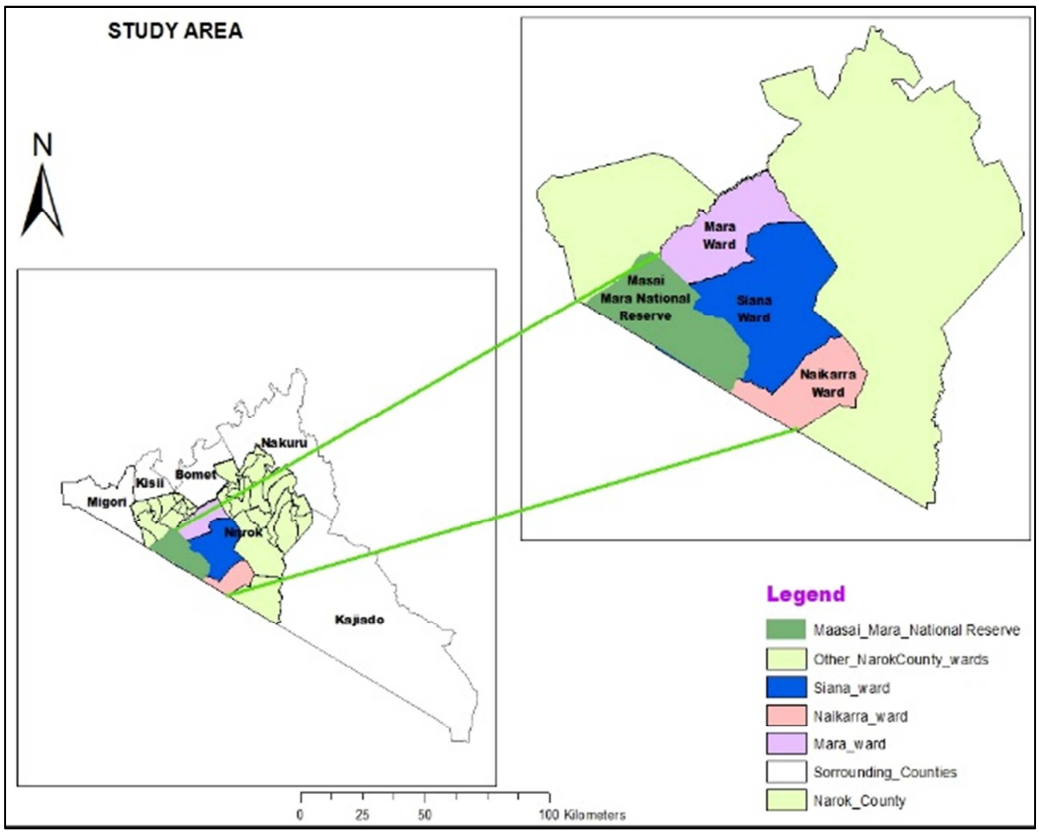


Source: Adopted and modified from [6]

Figure 1. *Sustainable Livelihood Conceptual Framework.*

3. Materials and Methods

3.1. Study Area



Source: Researcher, 2022

Figure 2. *Map of the study area.*

The study was conducted in Siana Ward, Naikarra Ward and Mara Ward of Narok County (figure 2). It is located in the South Western part of Kenya and lies between latitudes $0^0 50^{'}$ and $1^0\ 50^{'}$ S and Longitude $35^0\ 28^{'}$ and $36^0\ 25^{'}$ E. Siana Ward covers an area of 2800 km^2, Mara ward covers 1318 km^2 and Naikarra Ward covers 1053 km^2 [12]. Siana Ward has seven sub-locations, namely; Sekenani, Koyiaki, Nkoilale, Siana, Olkinyei, Eldonya Narasha and Megwara while Mara Ward has five sublocations; Aitong, Lemek, Mararianda, Rongena and Enelerai. Naikarra Ward has five sublocations; Leshuta, Naikarra, Esoit, Olderkesi and Osarara/ Entarado Wards. It lies at a mean altitude of 1600m above sea level, mean annual rainfall of 1015 mm and daily maximum temperatures range of between 26°C and 30°C, while minimum temperature range between 12°C and 14°C [3]. It borders Maasai Mara National Reserve, which is considered "Kenya's Jewel" regarding wildlife resources.

3.2. Wildlife Species in Maasai Mara National Reserve

According to Narok County CIDP [26], the MMNR has close to 100 species of mammals, amphibians and reptiles and over 420 species of birds. Further, past studies have indicated that the reserve is known for the big five animals, which are the leopard, elephant, rhino, buffalo and lion [4, 25].

3.3. Population

According to KNBS and KPHC [16, 17], Siana Ward, which comprises of seven sub-locations has 55388 persons, of whom 27928 are males and 27460 are females, while Mara Ward comprising of 5 sublocations, has a population of 46661 individuals (23431 are males and 22930 are females) and Naikarra Ward has a population of 33081 (16003 are males and 17078 are females).

3.4. Sampling Techniques and Sample Size

This study used mixed methods, that is, the concurrent design where both quantitative and qualitative components of the study were executed [9, 14, 2].

3.4.1. Sample Size

The population of Siana Ward is 55388 individuals and 10385 households, Mara Ward is 46660 individuals and 9400 households and Naikarra ward has 33081 individuals and 6819 households [17] and all used the formula proposed by Kothari [18], to derive the sample sizes for each area of study. For Siana Ward, the sample size was derived as follows;

$$n = \frac{z^2 \times p \times q \times N}{e^2(N-1) + z^2 \times p \times q} \quad (1)$$

where N = the population of the study area
z = 1.96 (using 95% confidence level)
p = 0.5
q = (1-.5) = 0.5
e = 0.05 (confident that the percentage has been estimated to be within ± 5% of the true value)
then;

Using (1) the sample size (n) for Siana Ward was calculated as;

$$n = \frac{1.96^2 \times 0.5 \times 0.5 \times 55388}{0.05^2(55388-1) + 1.96^2 \times 0.5 \times 0.5}$$

$$n = \frac{53194.64}{139.4279} = 382$$

n = 382

The sample size for Siana Ward was 382

The sample size for Mara Ward was derived as follows using (1);

$$n = \frac{1.96^2 \times 0.5 \times 0.5 \times 46660}{0.05^2(46660-1) + 1.96^2 \times 0.5 \times 0.5}$$

$$n = \frac{44812.264}{117.6104} = 381$$

The sample size for Mara Ward was 381

Using (1) the sample size for Naikarra Ward was computed as follows;

$$n = \frac{1.96^2 \times 0.5 \times 0.5 \times 33081}{0.05^2(33081-1) + 1.96^2 \times 0.5 \times 0.5}$$

$$n = \frac{31770.9924}{83.6604} = 380$$

The sample size for Naikarra Ward was 380

Mugenda G. A and Mugenda O. [23] proposed that 30% of the sample size can be used in the study. Therefore, this study used 30% of the sample size in each ward.

Siana Ward; 30% of 382 = 115, therefore, sample size used was 115;

Mara Ward: 30% 0f 381= 114, therefore, sample size used was 114;

Naikarra Ward: 30% of 380 = 114, therefore, sample size used was 114.

3.4.2. Sampling Techniques

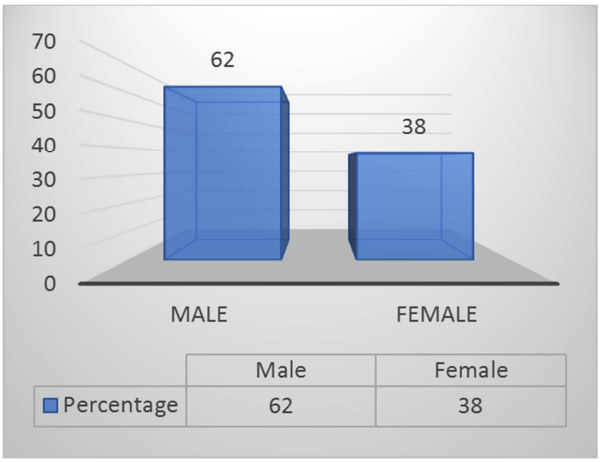
This study used stratified sampling. Three County Assembly Wards (Siana, Mara and Naikarra Wards) were stratified using the existing sublocations. In Siana Ward, there are seven (7) sublocations that became seven strata in this study; in Mara ward, there are five (5) sublocations which in this study became five strata; and in Naikarra, there are five (5) sublocations became five strata. Within the strata, the subjects (respondents) were selected using systematic random sampling. Purposive sampling was used to select key informants that were interviewed on the wildlife conservation benefits accruing to the community. This study conducted 2 FGDs of 6 individuals in each at Nkoilale trading centre, where every ward was represented. All the members of the FGDs were identified on the basis of their knowledge of the matters within their villages and were considered as reliable sources of information.

4. Results and Discussions

4.1. Demographics

It was noted that 62% of the household heads were males while 38% were females (figure 3). The study findings on the household heads slightly differed from the observation by Kathleen [15], where the researcher noted that the male household heads were 59%. Other research findings elsewhere [38] were in line with the findings of this study, however, Mojo *et al.,* [20] observed the males were extremely high at 99%.

The study further observed that, despite the males being the majority, the number of homes headed by women was on the rise. From the FGDs, it was noted that most households appeared to have women as household heads largely because of the polygamy attribute embraced mainly by the elderly Maasai because it was a significant component of their cultural practices. Another reason also attributed to this is the pastoralism aspect of their culture, where most of the men were out in the grazing field or looking for pasture and water for their livestock and women were left at home to do their household chores.



Source: Researcher, 2022

Figure 3. *Gender of the respondents.*

The majority of household heads were of age between 38-47 at 40.8 %. Most of these household heads had no formal education at 47.2%, household heads with primary education were 14%, secondary education at 23.9%, tertiary education at 8.5% and only 6.4% of the household heads were university graduates or were still in the university (table 1).

Table 1. *Age, education level and occupation of the respondent.*

Age	Frequency	Percentage
18-27	42	12.2
28-37	90	26.2
38-47	140	40.8
48-57	55	16
58-67	13	3.8
68 and above	3	0.9
Education level	Frequency	Percentage
None	162	47.2
Primary	48	14
Secondary	82	23.9
Tertiary college	29	8.5
University	22	6.4
Occupation	Frequency	Percentage
Pastoralist	223	65
Farmer	48	14
Trader	47	13.7
Driver	8	2.3
Doctor	4	1.2
County official	6	1.7
Teacher	6	1.7
Tour guide	1	0.3
Total	343	100

Source: Researcher, 2022

From table 1, the study findings indicated that majority of the household heads were pastoralists (n = 223) at 65%, farmers were (n = 48) at 14%, traders (n = 47) consisting of 13.7%, drivers ware (n=8) translating to 2.3% while county officials and teachers (n = 6) both consisted of 1.7%, doctors were (n = 4) making up of 1.2% of the sample size. 0.3% (n =1).

4.2. Socio-Economic Benefits Derived from MMNR

Respondents were asked if they had ever accessed any benefit from MMNR, and from the findings, 81.9% revealed that they had received it (table 2). However, 18.1% of the respondents had not perceived any benefits from MMNR. These findings concur with that of Shah [36], where the majority of the local community members were beneficiaries of the proceeds from MMNR. Shah [36] further noted that the majority of those who benefited were from a distance of 1-2 km from the MMNR, and on this, it did not concur with the findings of this study which revealed that only 7.6% of the respondents who acknowledged perceiving benefits from MMNR were living in a distance of between 0-5 km from the protected area [38]. It was also noted that quite a number of people (18.4%) who benefitted from the MMNR lived at a distance of between 30-35 km. This may be attributed to the observation made by Shah [36], who suggested that members of the local community did not settle in most of the areas closer to the reserve, which is attributed to either having numerous wildlife or the land had been leased out to form conservancies which hosted wildlife for tourism associated activities and also acted as dispersal areas for the wildlife from the MMNR. The distances closer to the park, therefore, were not only ideal for the local community in terms of perceiving the most benefits but also it was observed to pose the greatest economic costs to the inhabitants of the study area. Notably Kathleen and Mojo *et al.,* [15, 20], in their study observed that the perceived benefits were in terms of increased access to education through bursaries and expansion of learning facilities, improvement of medical care, transportation and enhanced security, safe and secure water supply, support for the community enterprises like trade in livestock and livestock products with different lodges, camps, and hotels within the study area.

Table 2. *Perceived socio-economic benefits from MMNR per distance.*

Distance	Yes (%)	No (%)	Total (%)
0-5 km	7.6	0.6	8.2
6-11 km	11	1.2	12.2
12-17 km	10.5	1.7	12.2
18-23 km	8.5	3.4	11.9
24-29 km	6.1	2.3	8.4
30-35 km	18.4	1.7	20.1
36-41 km	9.6	2.9	12.5
42 and above km	10.2	4.1	14.3
Total	81.9	18.1	100

Source: Researcher, 2022

4.3. Relationship Between the Distance and the Social Benefits Derived to the Local Community from MMNR

The study computed the Spearman's rank correlation to find the association between the distance from MMNR and the social benefits derived to the local community from MMNR and also to test the study's hypothesis. The distance was accorded values as 1= 0 -5 km, 2 = 6 -11 km, 3 = 12 -17 km, 4 = 18 -23 km, 5 = 24 -29 km, 6 = 30 -35 km, 7 = 36 - 41 km and 8 = 42 and above km. The same case also was done to the social benefits where the benefits under consideration in the study were; employment opportunities, road construction, health care provision, cash transfer, provision of school bursary, availability of clean water and building of schools. The respondents were asked to rate the extent to which they agreed that, employment opportunities, road construction, health care provision, cash transfer, provision of school bursary, availability of clean water and building of schools were the main social benefits derived from MMNR to the local community. A Likert scale was provided where 1= Strongly agree, 2 = Agree, 3 = Neutral, 4 = Disagree and 5 = Strongly disagree. A Spearman's rank Correlation was computed (table 3) to test the hypothesis, and the analysis revealed a weak negative correlation ($r = -.180$, $df = 284$, $p = 0.002$) between distance and social benefits derived from MMNR to the local community. The p-value = 0.002, which is less than 0.01, therefore, the study concluded that; socio-economic benefits vary significantly with distance from MMNR.

Further, the findings of the study exhibited a significant weak negative correlation between distance and socio-economic benefits ($r = -.180$). It was therefore observed that as distance increases, the socio-economic benefits also decrease.

Table 3. *Spearman's rank Correlation Coefficient.*

			Distance (km)	Social benefits
Spearman's rho	Distance (km)	Correlation Coefficient	1	-.180**
		Sig. (2-tailed)		0.002
		N	286	286
	Social benefits	Correlation Coefficient	-.180**	1
		Sig. (2-tailed)	0.002	
		N	286	286

Source: Researcher, 2022

4.4. Correlation Between Distance and Number of Employed People in MME

A Pearson Product Moment correlation coefficient was computed to determine the strength and relationship between distance from MMNR and the number of people employed in MMNR per household as either permanent or casual, including in camps. The results indicated in table 4, (r_s (343) = -.520, p = 0.000) showed a significantly strong negative relationship between distance and the number of persons employed in each household. These findings implied that as the distance increases away from MMNR, the number of persons employed in MMNR decreases. From the FGDs, it was noted that the majority of the local community members who were employed in MMNR were drivers, wildlife rangers, attendants in restaurants, guards, cleaners, tour guides, tour drivers, and cooks, and hardly were they employed as managers in various organizations including hotels and lodges within the MMNR.

Table 4. *Correlation between distance and employed persons.*

		Number of employed members/HH	Distance (km)
Number of employed members/HH	Pearson Correlation	1	-.520**
	Sig. (2-tailed)		0.000
	N	343	343
Distance (km)	Pearson Correlation	-.520**	1
	Sig. (2-tailed)	0.000	
	N	343	343

Source: Researcher, 2022

4.5. An Estimate of the Distance from Where the Respondent Lived to the Nearest Selected Social Facilities

The respondents were asked to estimate the distance from where they lived to the nearest social facilities, which included; the nearest location to a public school, the location of piped water, borehole, or pan and the location of a bank/micro finance or a Sacco. The distances were given in ranges of; 1 = 0-4 km, 2 = 5-9 km, 3 = 10-14 km, 4 = 15-19 km and 5 = above 20 km. Across tabulation of the number of years the respondent had lived in the study area and the estimated distance from the social facilities was then computed. The findings are represented in table 5, which indicated that most respondents could hardly find access to a bank/microfinance institution or a Sacco. During an FGD session, it was revealed that most residents have to travel to Narok town to access financial assistance, especially credit services, save for the M-Pesa services that were now available. The difficulty of accessing credit was reflected in other investment opportunities especially those who already wanted to try alternative activities that would provide income because most respondents reported lacking adequate capital to invest in any sustainable income activities. It was also indicated from FGDs discussions that the youth who, most of whom were engaged in motorcycle enterprise (boda-boda) were finding it difficult acquiring their own motorcycles and thus they could only work for other people who were able to acquire one. The following is an FGD extract from the study conducted:

"…there are no programs within to help the bodaboda and women engaged in beadwork access credit. You buy alone using your money or you go to Narok town and borrow money in a bank. Or else you can approach the company selling motorbikes and deposit some amount and then you make agreements on how you can clear the balance as you operate with the motor cycle…. the installments are normally done mostly per month and if you default your bodaboda can easily be repossessed by the company yet its tasking to get the monthly instatements…"

Table 5. *An estimate of distance from the respondent's residence to selected social facilities.*

The length of time lived in this Ward	where you live to the location of a public school	where you live to the location of piped water; borehole; pan	here you live to the location of bank/microfinance/Sacco
0-3 years	2	2	5
4-7 years	1	1	5
8-11 years	1	2	5
12-15years	1	1	5
16 and above years	2	2	5
Total	1	2	5

Source: Researcher, 2022

Women, for example, who engage in beadwork, carvings and trade in artifacts said it was difficult saving money since they could not form a formal Sacco, which would later help them access credit and other loan facilities. However, schools were within walking distances for the majority of pupils and students because they were at 0-9 km (table 5). The same case applied to the availability of water in the form of piped water, borehole, or in pans. This was an indication that the benefits from MMNR had created some impact in the form of these important facilities and that the 19% County benefit-sharing scheme could be slightly felt in these projects. However, it was difficult to attest whether the schools and water points had been exclusively built from the proceeds of MMNR or funds had also been sourced from other places.

Previous studies [5] indicated that while water sources and nursery schools are needed in all settlement areas, what was imperative was the creation of good quality facilities. Further, the researcher noted that most members of local communities were starting to prioritize quality schools over proximity, though the other majority wanted schools, clinics and boreholes closer to their homes. It was no different in this study since, from non-participatory observation and FGDs, most schools in the study area were boarding schools that were well or moderately equipped to meet the needs of the students/pupils.

5. Conclusion

The study concluded that, there are socio-economic benefits associated with MMNR which accrue to the local community and vary with distance away from the reserve. However, the findings indicated a weak relationship which could point out at the incoherence of the benefit sharing scheme. Further, it was clear that, that the local's livelihood networks suffered immense interruption from wildlife and required commensurate compensation.

6. Recommendations

The study recommended that;

a) The 19% policy on wildlife conservation benefits and its sharing within the MME should be enhanced to 35% by the County Government of Narok, so the it can cover majority of the deserving cases. Public participation must be stepped up in improving the policy in order to amend the policy with the most useful information from all the stakeholders.
b) The banking institutions in Kenya should consider establishing, banks and micro-finance institutions in main business centres within the MME. This will create enhanced access to credit facilities to the local community

that may be invested in alternative livelihood activities.

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