Local Communities' Perception of Ecotourism and Attitudes towards Conservation of Lake Natron Ramsar Site, Tanzania

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Abstract

Despite the ecological and economic importance of ecotourism in supporting conservation, degradation of natural ecosystems remains a matter of concern, which emphasizes the need to understand the perception and attitudes of local communities towards ecotourism as a conservation strategy. This study was conducted at Lake Natron to examine local communities' perception of ecotourism and the influence of ecotourism benefits on local support for conservation. Questionnaire survey and interviews were conducted on the local residents living in the adjacent villages to the lake. Data were analyzed using both descriptive and inferential statistics. Findings indicate that, local communities' perception of ecotourism and attitudes towards conservation varied across the study villages as ecotourism investments, activities and benefits were concentrated in only one village. The study recommends the right balance to be struck over ecotourism benefits in order to ensure increased local support for conservation.

Key words: Lake Natron, ecotourism, local communities, conservation, perception, attitudes

1.0 Introduction

Protected areas managed as ecotourism sites play a significant role in generating much needed revenue to pay for conservation of biological diversity as well as improving the financial income of the local communities (Belete & Assefa, 2005). However, these same sites have increasingly been threatened by human encroachment and over-exploitation of their resources resulting from growing human development activities in and around their borders (Ross & Wall, 1999; Boo, 1993). Human-induced factors such as land-use changes for infrastructural development, agricultural expansion and grazing activities have been reported as among the major causes of the current and future biodiversity loss (Benítez-López, Alkemade, Pita, & Verweij, 2010; Lee, 1998; Herne & Salinas, 2002). Ecotourism has widely been promoted in many countries and regions as a sustainable development tool that contributes to the dual goals of conservation of threatened ecosystems and sustainable development (Wearing & Neil, 2000; Lindsay, 2003). However, successful management of ecotourism and the success of conservation in protected areas often require local people's support for conservation which is strongly influenced by perception of the conservation impacts that are experienced by the local communities (Sekhar, 2003).

Lake Natron in North-Eastern part of Tanzania (Figure 1) is a well-known protected area managed for conservation and ecotourism. Ecotourism activities such as bird watching, hiking and nature photography, are practiced in this area. In 2001, the area was listed as Tanzania's second Ramsar Site in recognition of its ecological importance, particularly for water birds conservation. Specifically, Lake Natron is one of the four critical breeding sites for the Lesser Flamingo *Phoenicopterus minor,* as well as being the only significant and regular breeding site, for approximately 2.5 million individuals (75% of the world population) (Birdlife International, 2008). Besides the Flamingos, Lake Natron also offers feeding and roosting opportunities for more than 100,000 other water birds. For instance, up to 30% of the global population of Chestnut-banded Plover *Charadrius pallidus* is found in the area. The area around the lake is comprised of fragile volcanic soils, desert-like landscape that supports a thin population of large mammals as well as providing significant livelihood support to local communities, especially the Maasai people. Culturally, Lake Natron borders "Mountain of God," Oldonyo Lengai, which is the highest active volcano in Africa and a popular tourist attraction site (Nelson, 2005).

The existence of such diversity of natural and cultural resources has made Lake Natron a reasonably important tourist destination in the country. Figure 2 shows that the number of foreign tourists at Lake Natron has been increasing steadily from the year 2009/2010 up to 2012/2014. In spite of the positive trends of tourists visiting Lake Natron, and the importance of the Lake Natron area for conservation and tourism; the lake is facing wide-spread threats (current and potential) from economic development activities that negatively impact the conservation value of the area. According to Yanda & Madulu (2005), the rift valley lakes of East Africa, including Lake Natron; have been increasingly threatened by local and global economic pressures. These lakes have gone through significant anthropogenic land use pressures and over-exploitations of natural resources which have been causing irreversible change to the biological diversity and the physical environment that support those resources. For instance, a study by Gereta, Wolannski, & Chiombola (2003), found that while Flamingos in Lake Natron play an important ecological and economic role, their survival is uncertain due to the influence of unregulated livestock grazing and small-scale irrigation crop farming.

Lake Natron is also facing potential threats such from Tanzanian government plans to build a Soda ash factory along the shore of the lake that will extract Soda Ash from the lake as well as a possible new fast road, the Serengeti highway, which would skirt Lake Natron. These development activities are likely to have negative implications on the conservation value and/or recreational quality of the area. Literature has widely acknowledged that local people's support for conservation is imperative for sustainable ecotourism programs and management of protected areas (Holmes, 2013; Bookbinder, Dinerstein, Rijal, Cauley, & Rajouri, 1998). According to Holmes, (2013) local people can be a direct threat to protected areas when they fail to cooperate with protected area authorities or participate in conservation initiatives such as ecotourism. Deeper understanding of local people perception of ecotourism as a conservation strategy in protected areas and factors that shape these perceptions are therefore crucial steps in devising appropriate strategies that will elicit the widespread local support for biodiversity conservation and ecotourism management (Ninan, 2007; Szell & Hallett, 2013). The present study, therefore, examines the local communities' perception of ecotourism, and the influence of ecotourism benefits on local people's support for conservation of Lake Natron Ramsar Site. This information is useful in guiding the policy interventions and furthers the understanding of protected area managers regarding local people's needs and aspirations for proper management of ecotourism and conservation of Lake Natron.

2.0 Sampling procedures, data collection and analysis

The target population for this study consisted of the local communities living in the adjacent villages to the lake. Three villages namely Engaresero, Pinyinyi and Inchangiti Sapukini (I/Sapukini) were purposely selected based on the understanding that the local communities in each of the village are heterogeneous mainly in terms of economic activities practiced which may influence their perception of conservation related issues and values attached to the lake and its surrounding environment. Data were collected from both primary and secondary sources. Primary data were obtained through key-informant interviews and households' questionnaire survey. Secondary data were acquired from text books, relevant journals, documents compiled by the various institutions and community records in the respective village government offices. Interviews were conducted on 6 local residents who had better knowledge of the research subject. Questionnaires were conducted on 316 households which were selected by systematic random sampling technique. Using a village register the first household was randomly selected followed by systematic sampling in selecting the subsequent households (Saunders, Lewis, & Thornhill, 2007). The distribution of the household respondents in the selected villages is shown in Table 1.

Data analysis was conducted using Statistical Package for Social Sciences (SPSS) version 20. Descriptive statistics such as frequencies, percentages, mean and median scores were used to summarize respondents' demographic and socio-economic profiles. Inferential statistical analysis made use of Pearson chi-square tests to find the relationships between variables and establish the factors influencing peoples' perception and attitudes.

3.0 Results

3.1 Socio-demographic profile of respondents

The socio-demographic characteristics of respondents as presented in Table 2 indicate that the majority 227(71%) of households' respondents were natives to the area. Among the basic socio-demographic characteristics, significant differences ($p<0.05$), among villages were found on respondents' origin, gender, level of education, income and household size. The highest proportion of immigrants 45(51%) was found in Engaresero village and the lowest 12(14%) in I/Sapukin village.

Household survey respondents were largely males, constituting 213(67%) of the sample, while females represented 103(33%) of households. The lowest number of female-headed households was found in I/Sapukin village where only 22(21%) of households were led by females. Findings further suggest that the illiteracy level among respondents in the study area is very high. Nearly half 152(48%) of respondents were illiterate and/or semi-illiterate defined as those who had never attained any formal education and those who had little education. The illiteracy level was high in I/ Sapukin village, as over three quarters 75(76%) of respondents had never been to school and only 16(16%) had attained at least primary education. On the other hand, majority of respondents 71(68%) in Engaresero village had acquired primary education and only a few 16(16%) had no formal education. Similar results were found on income levels of respondents in the study villages. The annual average income was significantly higher (US$11,196) in Engaresero village compared to I/Sapukin (US$ 1,832) and Pinyinyi villages (US$ 3,641). Overall, majority of residents 204(64.5%) earned less than US$ 1,000 annually and only a few 31(10%) earned above US$3,000. Over three quarters 241(76%) of households in the study area had five members or more. Household sizes ranged between 2 and 23 persons, with an average of 8 persons (SE =0.2458, median=9, mode=10) per household. Ssurvey responses also showed that household sizes vary among the villages and, I/Sapukin village had significantly higher average household sizes compared to Engaresero and Pinyinyi villages.

3.2 Local residents' attitude towards Lake Natron

In ascertaining attitudes of local residents towards conserving Lake Natron, respondents were asked to rank the importance of the lake and its resources in terms of its contributions towards provision of income or other benefits to their households, on a 5-point likert scale ranging from 1 point, "not important at all" to 5 points "very important". Results suggest that, majority of respondents held favourable attitudes towards Lake Natron, with 244(77%) of respondents of the opinion that Lake Natron is either important or very important in contributing to their households income. Findings in Table 3 indicate that households respondents of Engaresero village had the most favourable attitudes indicated by the highest mean score (M=3.67, SD=0.93) followed by Pinyinyi village (M=3.5, SD=0.82) and finally I/ Sapukin (M=2.38, SD=0.86).

In order to gain a better understanding of how communities benefit from Lake Natron, respondents were asked whether they derive any tangible products from the area. Data revealed that, the majority of households 282(89%) were extracting natural products from the lake and/or its catchment area either for cash or household consumption as shown in Table 2. Fuel wood is the main source of energy in the study villages and 282(89%) of households extract fuel wood from the environment (Table 4). Further, soda ash was the second-most product derived from Lake Natron by nearly half 155(49%) of households, followed by the building poles 146(46%) and animal fodder 136(43%). Other derived products included thatching grass 116(37%) and medicinal herbs 109(35%). A few respondents mentioned fish 23(7%) and 7(2%) mentioned flamingo eggs. Extraction of resources such as fuel wood, soda ash, herbal medicine and flamingo eggs did not significantly differ across villages ($p > 0.05$). However, the harvest of animal fodder and thatch grasses was significantly higher ($p<0.05$) in Engaresero village, and a higher proportion of households in Pinyinyi village were extracting building poles and fish compared to the rest of villages. When level of dependency on natural resources was examined across the socio-demographic variables; only respondents' origin, gender and level of education were found to be significant factors ($P<0.05$) contributing to the differences on the dependency on natural resources (Table 5). There were more natives, females and less educated individuals who reported extraction of natural resources from the environments than their counterparts.

3.3 Income-generating activities

The role of various income-generating activities (including ecotourism) in improving the livelihood of the local residents was assessed by looking at the position they occupied as a source of household income. Table 6 shows respondents' main occupations and their annual incomes. Livestock keeping was a dominant activity practiced by the majority 264(84%) of the surveyed households. The activity contributed a significant proportion (52%) of the total annual household income (US$ 461,943). Livestock keeping represents a primary source of livelihood activity and engages over 80% of the labour force in each of the study village. Mineral extraction, mainly the soda ash; represented a considerable source of income for some households in the study area, and 13% of the respondents extracted soda ash from the lake. Retail trading of natural products such as fish, animal fodder, and thatching grasses contributed about 3% to the total annual household economy.

In total, the sale of natural products extracted directly from the environment (e.g minerals and fish) accounted for 15% of the total household economy making it the second-most contributor of household income after livestock keeping. Findings in Table 7 indicate no significant differences ($p<0.05$) on respondents' engagement in livestock keeping and mine extraction among the study villages. However, there exist significant occupational differences across the study villages on their participation in income activities such as crop farming and ecotourism. For example, despite the semi-arid nature of the area; 78(25%) of households were practicing crop farming, with significantly more proportion of respondents 60(19%) in Pinyinyi village being crop farmers compared to the rest of the villages.

Crop farming is mainly small scale irrigation and accounted for 12% of the total annual household income. Furthermore, 56(18%) of households respondents in Engaresero village were directly engaging in ecotourism-related activities such as tour guiding and selling of handcrafts. About 12% of the household income is derived from ecotourism with only household members of Engaresero village engaging in such activities. Other income activities such as the formal salary employment (apart from tourism jobs), wage labour and retail trading of non-natural resources products contributed less than 5% of the total annual household income. Income-generating activities also widely differed by origin and gender of respondents (Table 7). While there was significantly higher proportion of immigrants ($p<0.05$) engaging in ecotourism, retail trading and formal salary employment activities, many natives were livestock keepers. In terms of gender participation in income activities, the only significant difference was revealed in ecotourism. Findings indicate that there was higher proportion of male 43(14%) respondents engaging in ecotourism activities than females 13(4%).

3.4 Local residents' perceptions of ecotourism at Lake Natron

In assessing the local residents' perception of ecotourism; it was necessary to examine the role ecotourism play in improving local livelihood. In doing so, respondents were asked an open-ended question to state how their households and community benefit from ecotourism. The distribution of the benefits of ecotourism varied substantially among the study villages, and, only households' respondents in Engaresero village reported income figures from ecotourism. Of the 18% respondents with direct tourism income; 9% works as local tour guides, 6% are permanent employees in lodges, 2% produce and sell beadwork and less than one percent are local camp owners.

Apart from the direct income from ecotourism, interviews with the village leaders revealed that Engaresero village also derives revenues through the land rent and bed-night fees through leasing out some of its land to lodge investors. Other benefits include collections from the entrance gate's fees and donations from tour operators operating in the area. These revenues are normally reinvested into the village development projects. As a result, the local residents in Engaresero village are able to obtain the indirect benefits of ecotourism resulting from community development projects such as construction of schools and health facilities. This survey also revealed a number of other tourism benefits that have been dispersed equally to all village communities regardless of the village participation in tourism activities. These include the 20% share from the tourist hunting obtained from various fees such as concessions fees and bed night's charges. Also, all the villages adjacent to Lake Natron receive 25% share of the aircraft landing fees from hunting companies that are returned to them via the Wildlife Division.

Further assessment of the residents' perception of ecotourism at Lake Natron adopted six statements which reflect a set of economic benefits and social cost as a result of ecotourism in the area. Respondents were then asked to rank the statements on a 5-point likert scale ranging from 1 point, "strongly disagree" to 5 points "strongly agree". Table 8 summarizes the responses of residents' perception. Over half of households 58(55%) (Mean=2.8, SD=1.02) in Engaresero village feel that ecotourism had created jobs, by employing a significant proportion of youths. Another majority 71(68%) (Mean=3.81, SD=0.62) acknowledge the contribution ecotourism in provision of better social infrastructures, and a significant majority 75(71%) (Mean=4.11, SD=1.27) of households recognise the contribution of ecotourism in increasing medical and educational opportunities. On the contrary, over 85% of household respondents in I/ Sapukin village, strongly feel that ecotourism has not resulted into economic benefits which was shown by the mean perception score (Mean<2.5) below the midpoint. While nearly half of respondents 54 (48%) in Pinyinyi village (Mean=2.44, SD=0.67) were neutral in their opinion about the statement that ecotourism has resulted into increasing medical and educational opportunities. Many household respondents (75%) (Mean<2.5) did not acknowledge the contribution of ecotourism in either creating jobs or improving infrastructures.

In terms of the negative social impacts of ecotourism, nearly all the household in I/ Sapukin and Pinyinyi villages did not perceive any social cost as a result of ecotourism (Mean<2.50). Even in Engaresero village where ecotourism activities are practised, over 70% of households disagreed with the statement that ecotourism has negatively influenced the local culture and increased the cost of living as shown by low mean scores (Mean<2.50). However, many households 85(81%) (Mean= 3.52, SD= 1.67) in Engaresero village, believe that ecotourism has caused immigration and crowding problems in the area.

4.0 Discussions

The area around Lake Natron is predominantly occupied by Maasai and Sonjo, however, several minority groups have been migrating into the area attracted by different economic opportunities such as ecotourism. A report by (RAM, 2008), noted that, the minority groups around Lake Natron are found in strategic villages where activities such as agriculture and tourism are common. Currently, Lake Natron has a relatively big household size compared to that of the national average. According to the 2012/13 household budget survey in Tanzania, the average household size on mainland Tanzania was five persons (NBS, 2012). The relatively big household size of this area implies that there is high demand of natural resources for people to meet their subsistence needs, and hence higher tendency to extract resources from the protected area. Herlocker (1999), cites population increase and immigration into higher potential rangeland areas such as the Maasai land as some of the factors responsible in intensifying the competition of scarce natural resources in these areas.

Natural resources found in, and around, Lake Natron contribute greatly to the daily sustenance of communities in the study villages. The natural resources extracted by communities are diverse in nature, and comprise a primary sources of fuel wood, animal fodder and construction materials in the form of building poles and thatching grass. Previous studies such as Kumar (2012); Sapkota & Odén (2008) have reported that socio-demographic variables such as gender, education and income may influence local residents' attitudes towards natural resources and their overall dependency. In the present study, we found that female respondents and those with less formal education depend more on natural resources than their counterparts. Females' more dependency on the natural environment could be related to the fact that Maasai women participate less in the cash economy and/or alternative income activities, such as ecotourism which has been primarily attributed to lower levels of educational attainment as already demonstrated by the findings. It was also noted that, less educated residents were unlikely to hold favourable attitudes towards conservation. This was demonstrated by the fact that nearly half 150(48%) of residents who were illiterate or had little education collected raw soda and other natural products for household consumption as well as selling to supplement their household income. This finding is consistent with a study by to Mehta & Heinen (2001), in Nepal to find out whether community-based conservation shape favourable attitudes among locals. The authors found that, high school graduates were in a much better position to comprehend the importance of the conservation area, resulting in positive attitudes. Low literacy level among respondents in the study area especially women could be one factor that hinders their full involvement in conservation and /or ecotourism activities and compel them to engage in unskilled and low paying jobs that have negative impacts on the environment. Some authors, such as Hedge & Enters (2000), pointed that, education opens up diverse and better employment opportunities and hence highly educated people tend to move away from activities related to extraction of natural resources.

In addition, Ezebilo (2012) argues that, individual's level of education is likely to influence the amount of information that a person may have about the improvement of nature. Formal education also gives people greater access to information regarding the future benefits of new projects. Therefore, educated people may have a greater understanding of the future benefits of nature and hence be more likely to have positive perceptions about conservation projects. Since the communities around Lake Natron consist of a significant majority of people with little or no education, it is important to increase access to information regarding the benefits that present and future generations can derive from nature conservation projects. This will help increase community acceptance of conservation projects.

Although poverty may have different connotations for Maasai who define wealth in terms of the number of livestock one has, the findings of this study indicated a state of poverty among the local residents and the likelihood for the community to exploit environmental resources unsustainably. This was demonstrated by poor living conditions and the fact that significant proportion (65%) of households reported insufficient annual income to support basic households' expenditures. The findings of this study, however, indicated no significant association between respondents' income and dependency on natural resources.

This is contrary to a study by Jefferson, Bryan, Bushley, & Shimona (2007), who found that wealthier households relied less on forest products from the protected area while poorer households were heavily dependent on parks resources to meet their subsistence need. Despite widespread poverty among the study villages, findings of this study revealed significant differences in income levels among the study villages. The average annual household income in I/ Sapukin village was much lower compared to that of Engaresero and Pinyinyi villages. The reason for the lower average income in I/Sapukin village could be related to limited income opportunities within the village which make households to exclusively depend on livestock keeping as a main source of income. On the contrary, there is more diversification of livelihoods activities in Engaresero and Pinyinyi villages and households in these villages were able to derive income from other sources apart from livestock keeping. For example, several residents in Engaresero village practiced ecotourism in addition to livestock keeping. This is also the case for residents in Pinyinyi village who are conducting small scale irrigation crop farming as a second-most income generating activity after livestock keeping.

Occupational differences among the study villages can be explained by the differences in culture and prevailing economic opportunities such as tourism within a particular village. In Engaresero village, tourist investments and facilities have provided an opportunity for the local residents to engage in ecotourism activities. Also, the Sonjo people who are primarily agro-pastoralists have been residing in Pinyinyi village which is located along the freshwater inflows to the lake. The villagers in Pinyinyi have therefore an opportunity to conduct crop farming by using traditional irrigation system by relying on water from River Pinyinyi. Apart from Pinyinyi village no significant farming is taking place in either Engaresero or I/Sapukin villages. Nelson (2005) reported the area's aridity as one factor that precludes any significant farming form taking place. Local residents' engagement in livelihood activities also varied according to the origin of households. Our findings have suggested that more immigrants were into ecotourism, retail trading and salary employment compared to natives who were mostly livestock keepers. This finding could be explained by the fact that immigrants are generally more educated than natives and, hence, able to participate in such activities which require some sort of formal education.

It is also important to note that, while ecotourism as an economic activity has helped in diversifying the livelihood of the people in Engaresero village, the activity has not been able to minimize the local people's pressure on natural resources. This was demonstrated by the fact that even the local residents in Engaresero village who were engaging in ecotourism activities were also heavily involved in other income generating activities such as livestock keeping. Interviews with the village leaders revealed that local residents wanted tourism, but not at the cost of jeopardizing their livestock. The finding is not surprising because livestock form a key component of the livelihood strategies among the Maasai communities and widely acknowledged as being vital to their welfare. According to Sato (1997) the size of herd is often directly correlated to the social status of an individual and symbolizes the main wealth. Thus, ecotourism has been merely considered as a chance for additional household income to be combined with or complement the existing livelihoods activities and not to be a substitute for these. The latter result could also explain the fact that ecotourism at Lake Natron is not well developed and therefore even the residents in village with ecotourism activities, may still want to diversify their livelihood strategies by engaging in other income generating such livestock keeping. By so doing, the local residents can reduce the risk associated with tourism activities which are often seasonal. A study by Asmamaw & Verma (2013) in Bale Mountains National Park also found similar results whereby, due to the seasonal flow of tourists, local people participating in ecotourism usually depend on agriculture as their main source of livelihood due to its contribution to their daily needs across the year.

The ways through which ecotourism complements existing livelihood activities of the local people is an important issue for discussion in this research. Interviews with the camp managers revealed that the local people especially men were recruited as full-time employees by tourists' camps and worked as tour guides, cooks, waiters, and watchmen. The local employees only receive on the job training as the camp owners do not provide formal training. Handicraft production for the tourists emerged as one of the main activities undertaken by local people - especially women, to make a small household income. Further, interviews with the Engaresero Village Executive officer revealed that the Wildlife Conservation Society of Tanzania (WCST) has recently initiated a cultural boma in Engaresero village so as to support women income by providing them with an opportunity to sell beadwork. Other local residents in Engaresero village also engage in small enterprises by running shops that sell goods mainly required by local residents and occasionally by tourists.

Also, through leasing some of its land to safari companies, Engaresero village has been able to derive a substantial amount of ecotourism revenues annually. The village has over the years been earning income from these campsites through per bed night fees and annual land fees paid to the village government. Secondary data from Engaresero village office indicated that, Ngaresero Mountain lodge pays to the government of Engaresero villageabout US$ 3,000 annually as land fees plus US$ 20 per bed-night fees. On the other hand, Lake Natron Tented Camp (Moivaro) pays US$10,000 annually as land fees in addition to US$ 7 per bed-night charges. Furthermore, a significant amount of the revenues obtained from the entry gate collections go to this village as contributions from photographic and ecotourism. Engaresero village also collects about US$ 39,000 annually as entrance gate fees on behalf of the Ngorongoro District Council and retains US$ 7, 800 (20% of this). According to the Village Executive Officer of engaresero, Engaresero village had earned over US$ 100,000 from ecotourism, by the year 2007, the revenue reinvested into various village development activities such as the construction of the primary school classroom and health centre.

With an exception to Engaresero village, none of the study villages have existing ecotourism venture and hence no economic benefits from ecotourism could be recorded. Even though these villages have various tourism opportunities, the local people have not been in a position to exploit the existing ecotourism opportunities in their areas. During the interviews, it was learnt that many members of Pinyinyi village were particularly interested in engaging themselves in different ecotourism related activities. The villagers pointed out factors such as lack of financial empowerment at the village level, little expertise and limited knowledge about tourism as main constraints for their involvement in ecotourism activities. According to Nelson (2004), the community's failure to control ecotourism as a means of employment and livelihood diversification on its lands largely relate to the remoteness of the Natron area which makes marketing of cultural attractions difficult. However, Lindberg & Hawkins, (1993) argue that ecotourism is expected to bring employment opportunities to remote regions for resident to support conservation in protected areas. In practice, the ability of the members of communities to capture the benefits from ecotourism is rarely ensured if the majority lack appropriate skills to be employed in the established tourist lodges. Currently, the training programmes offered to the local people by some Non Government Organisations (NGO's) such as the WCST mainly focus on raising the local people's environmental awareness about the importance of Lake Natron and its conservation so that people change their practices from current unsustainable investments into environmental friendly practices. Further, even though the local communities appear to be interested in initiating and implementing their own ecotourism schemes, many encounter financial barriers to provide for the necessary tourism products. High poverty levels among residents as shown by low income levels means villagers generally have few savings and lack access to capital to initiate or establish ecotourism enterprises. In light of these concerns, it may be difficult to have sufficient local community participation in tourism and support for conservation activities. Scheyvens (1999) pointed that, the signs of local disempowerment are visible when ecotourism merely results in small gains for the local community as most profits go to outside operators, while others cannot find a way to share in these economic benefits due to lack capital and/or appropriate skills. It has also been reported that, ecotourism as a development strategy is expected to enhance the long-term prospects of the local communities by providing them with income earning opportunities (Wall, 1997).

The only tourism-related benefit that I/Sapukin and Pinyinyi villages were able to generate came from tourism concessions situated on their villages' lands. The tourists hunting companies contribute 20% of their revenues obtained from various fees such as concessions fees and bed night's charges to all the villages which border Lake Natron. The villages also receive 25% of the aircraft landing fees from hunting companies that are returned to them from the WD. The perceived importance of ecotourism by local residents in protected areas has been noted as an important factor associated with residents' attitudes towards protection of such areas (Singh, Slotkin, & Vamosi, 2007). Residents' perception of Lake Natron and ecotourism in the surveyed villages revealed several interesting differences. The fact that distribution of ecotourism benefits was largely restricted to people living in Engaresero village, residents' perception of ecotourism benefits in this village were generally positive compared to the rest of the study villages. However, it should be noted that many residents perceived ecotourism benefits to accrue to the community more than to individuals, suggesting the communal nature of these benefits. As already demonstrated by the findings, ecotourism has provided direct employment opportunities to only a few individuals and mostly outsiders (immigrants) who owned tourists facilities and a few local elites. According to Spiteri & Nepal (2008), community level benefits are the most frequently acknowledged category of ecotourism benefits by local residents.

The main community benefits recognised by respondents in Engaresero village include: the constructed of cattle dam, nursery school, teachers houses, health centre, classrooms for primary school, a dormitory for a secondary school, culverts and bridges within the village. Other benefits include sponsoring children from destitute families to pursue secondary education as well as donations by tour companies which include medicines and beds for the health centre and books for schools. Community development projects have been the fundamental means of extending tourism benefits to individuals who are not directly employed in tourism. However, Archabald & Naughton-Treves (2001) note that, while collectively, social development projects may make meaningful contributions to a community, unless individual households are positioned to receive direct income, ecotourism may provide few incentives for conservation. Not surprisingly, the local residents in Engaresero village acknowledged a few job opportunities created by ecotourism because most of them do not receive direct benefits. Positive perception of the local residents towards ecotourism in protected areas provides great incentive to educate and encourage local participation in conservation and protection efforts (Karanth & Nepal, 2011). However, it is worth noting that, although many residents in Engaresero village had positive perception of ecotourism especially, in terms of its community benefits it brings, most of them were unlikely to support conservation and sustainable management of Lake Natron probably due to insufficient direct benefit they receive from ecotourism.

Additionally, while no direct benefits of ecotourism were experienced in Pinyinyi village, it was found that the overall residents' perception towards ecotourism were neutral. On the other hand, residents in I/Sapukin village viewed ecotourism less favourably, possibly because they find that ecotourism in the area doesn't bring equitable and sufficient benefits. This situation poses challenges in the development and management of ecotourism at Lake Natron. According to Bookbinder et al. (1998), ecotourism relies heavily upon the local support for its success and sound governance of ecotourism resources is critical in improving the wellbeing of the communities in the locality.

The overall respondents' perception of the negative impacts of ecotourism was minimal. In particular, nearly all respondents in I/ Sapukin and Pinyinyi villages did not perceive any negative impact of tourism and the main reason is related to the fact that local residents in such villages have either rare or no contact with the tourists and have not experienced any tourism activities in their areas. In Engaresero village however, ecotourism was perceived to strengthen the local culture and traditions as residents pointed Maasai culture as one of reasons that tourists visit Lake Natron. In emphasizing that ecotourism has not changed local traditions and culture, during the interview one respondent claimed: "*our culture and traditions have remained the same as it is difficult for Maasai to change their way of living*". However, immigration of people into the areas and overcrowding was perceived to be a result of ecotourism. In fact, some respondents who were immigrants mentioned that they, themselves, have come into the area because of economic opportunities created by ecotourism activities.

5.0 Conclusions

Generally, the findings of this study have established that, although the majority of the local residents perceive Lake Natron to be important in enhancing their welfare, many did not share the same positive attitude towards the sustainable conservation of the area. Ecotourism as a conservation and development strategy at Lake Natron has not helped local communities reduce the exploitation of natural resources and is yet to play a meaningful role in securing the livelihoods of the local people. Whilst the number of tourists coming to and staying at Lake Natron especially at Engaresero village is increasing, the community has very little control over the existing tourism ventures and benefit little from the income produced by these enterprises. Also, majority of local residents in the villages surrounding Lake Natron either do not generate income or receive little income from different ecotourism related activities compared to other economic activities such as livestock keeping. It was ascertained that Lake Natron lacks mechanisms to secure a fair distribution of ecotourism benefits and ecotourism has created uneven distribution of ecotourism benefits among different tourism stakeholders in the area. At the moment, the lodge-owners are the primary beneficiaries of tourists spending while many local people lack direct contact with the established ecotourism ventures and consequently do not receive much economic benefits. The study also revealed an unequal distribution of benefits among the local residents as most ecotourism benefits were confined in one village where tourist facilities currently exist. In addition, most employment opportunities to the lodges were mainly taken by men, immigrants and a few local elites. This situation has effectively marginalised some groups within the community with respect to ecotourism activities. As a result, the communities offer less backing to conservation and ecotourism development by participating in activities that are detrimental to the environment.

The local communities in the study villages have different perception of the benefits of ecotourism. Most of the village members in Engaresero acknowledged the benefits that ecotourism brings to the community but only a few noted the individual direct benefits brought by ecotourism. Thus, according to Emerton (1999), it is unlikely that the local residents will be motivated to conserve the resources that tourists want to experience. It is also important to note that whilst local residents in Pinyinyi village recognized the distributional inequalities present within the ecotourism industry locally, many were optimistic of the potential possible benefits they could derive from ecotourism and demanded that ecotourism activities be expanded to include tourist visits to their communities.

Additionally, the study area has been experiencing frequent drought and during the past few successive years, many livestock have been dying as a result of severe draught. Therefore, if well planned and managed, ecotourism in Lake Natron has a potential to improve the living conditions of the local residents and could be a reliable source of income for many years to come. Based on our findings, it can be concluded that the overall goal of ecotourism as a conservation tool in and around Lake Natron will be achievable through readjustment of the current mechanisms for the distribution of ecotourism income so that ecotourism benefits are shared equitably. This calls for the right balance to be struck over the benefits derived from ecotourism activities which are likely to solicit more positive attitude and support by local residents towards biodiversity conservation. The current distribution gap is likely to discourage conservation support from the local people whose activities are the main forces degrading the environment. Revenues from tourism can be increased by making Lake Natron a more interesting destination with diverse and high quality activities/services, which would allow tourists to stay longer.

There is also a need to build the capacity of communities so that they are able to take more control of ecotourism by better participating in planning, management and directly sharing of benefits. This may include showing communities how they could be involved in ecotourism, the benefits that might accrue, as well as how the benefit from ownership and control of ecotourism can be shared. Skills' training is also important to support the ability of villages to engage with the private sector in order to exploit different business opportunities.

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Figure1: Map showing the location of Lake Natron Ramsar Site

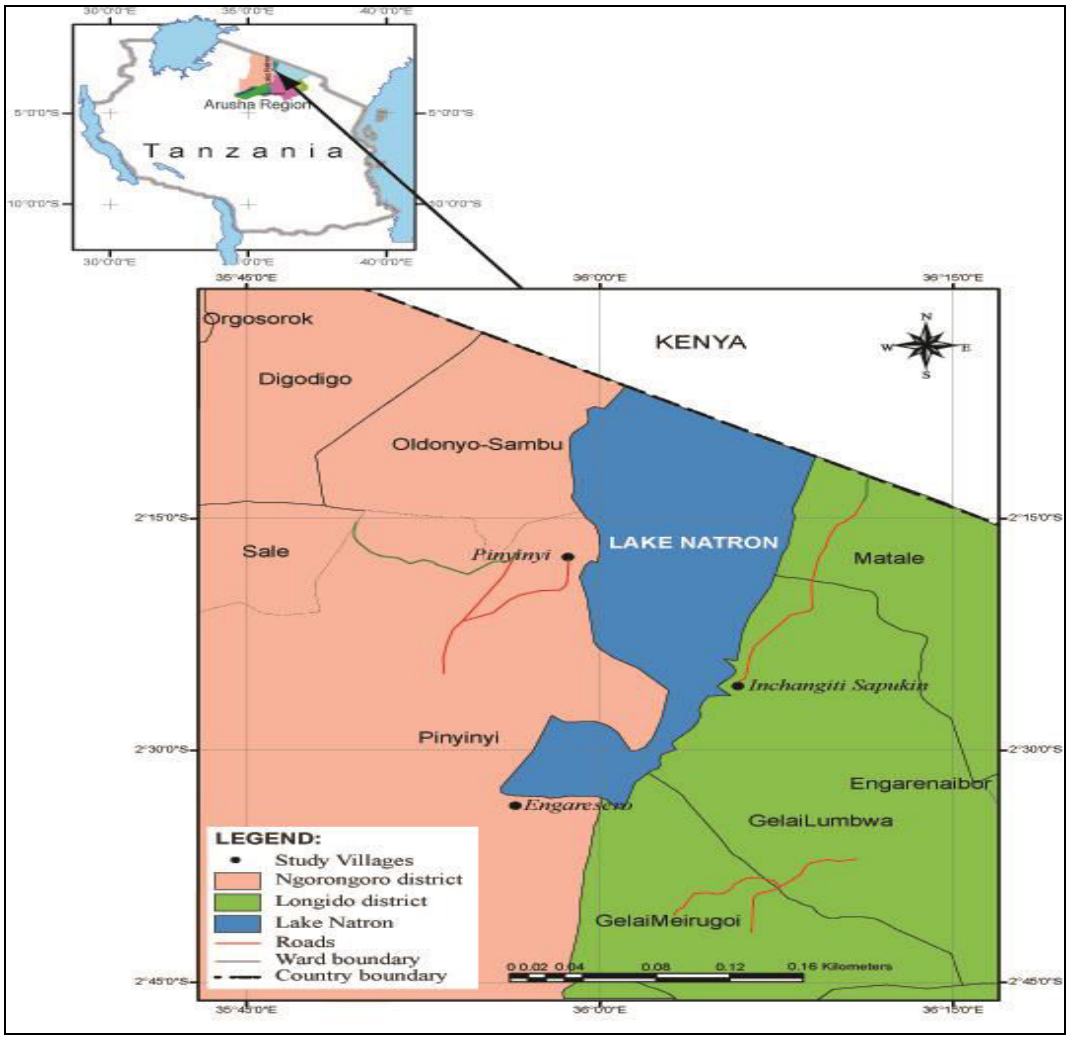
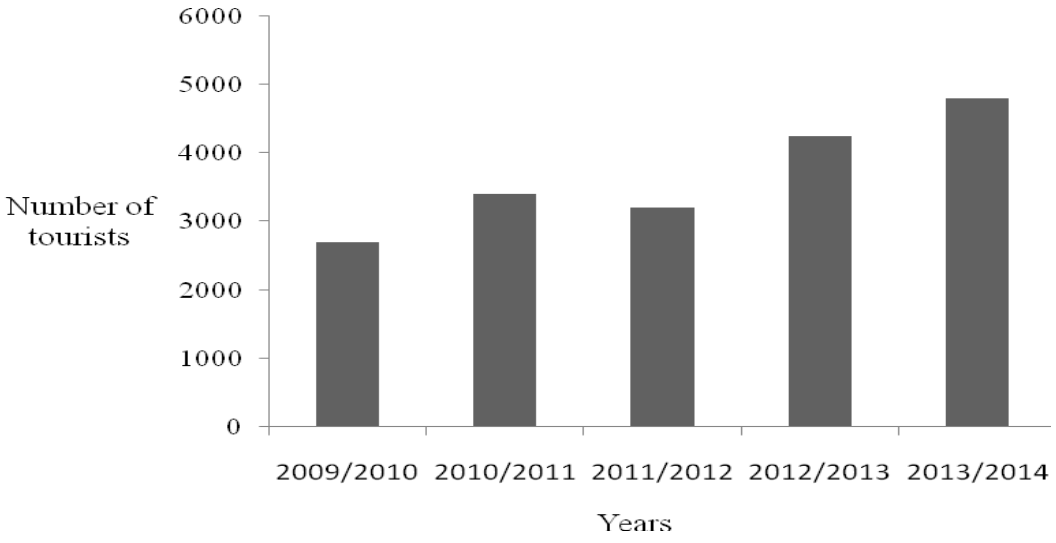


Figure 2: Number of foreign tourists to Lake Natron (2009-2014)



Source: Tourism office in Engaresero village

Table 1:Total Number of the Surveyed Households in the Study Villages

Villages	Engaresero	Inchangiti Sapukin	Pinyinyi	Total
Total number of households (N)	1,640	1,540	1,800	4980
Surveyed households (n)	105(6.4%)	99(6.4%)	112(6.2%)	316

Table 2 :Socio-Demographic Characteristics of Respondents Across the Study Villages

Variable	Engaresero (n=105)	I/Sapukin (n=99)	Pinyinyi (n=112)	Total N	χ^2	p-value	Average
Origin							
Native	60	87	80	227 (72%)	21.60	0.00	-
Immigrant	45	12	32	89 (28%)			
Sex							
Female	40	22	41	103 (33%)	7.10	0.04	-
Male	65	77	71	213 (67%)			
Level of education							
No formal	11	75	43	129 (41%)	111.6	0.04	-
education	5	8	9	22 (7%)			
Adult education	71	11	50	132 (42%)			
Primary	18	5	10	33 (10%)			
Secondary and above							
Annual income							
<1000	56	72	76	204 (65%)	28.8	0.04	5,556
1000-2000	29	14	20	63 (20%)			
2001-3000	5	7	6	18 (6%)			
>3000	15	6	10	31 (9%)			
Family size							
<5	42	8	25	75 (24%)	60.21	0.05	8
5-10	47	61	82	190 (60%)			
>10	16	30	5	51 (16%)			
Extraction of natural resources							
Yes	97	88	97	282 (89%)	23.8(0.12)	0.12	-
No	8	11	15	34 (11%)			

Table 3:Mean Perception Scores of the Importance of Lake Natron in Improving Livelihoods Based on a Five Point Scale Ranging from 1(Irrelevant) to 5 (Very Important)

Variable	Engaresero (n=105)							I/Sapukin (n-99)							Pinyinyi (n=112)						
Perception	1	2	3	4	5	Mean**	SD	1	2	3	4	5	Mean	SD	1	2	3	4	5	Mean	SD
	N*	N	N	N	N	3.67	0.93	N	N	N	N	N	2.38	0.86	N	N	N	N	N	3.5	0.82
	3	3	6	31	62			5	7	64	21	2			6	11	10	23	62		

*=number of respondents

**The higher mean score indicates more positive perceptions

Table 4: Extraction of Resources by Local Residents Across the Study Villages

Type of resources	**Villages**			**Total**	χ^2	**df**	**p-value**
	E/resero (n=105)	**I/Sapukin (n=99)**	**Pinyinyi (n=112)**				
Fuel wood	97	88	97	282 (89%)	3.66	2	0.90
Soda Ash	55	36	64	155 (49%)	18.70	4	0.30
Building poles	71	1	75	147 (47%)	9.33	2	0.05
Animal fodder	69	2	65	136 (43%)	34.83	2	0.03
Thatching grass	63	3	50	116 (37%)	32.14	2	0.03
Medicinal plants	54	37	18	109 (34%)	17.90	1	0.26
Fish	3	0	23	26 (8%)	35.36	2	0.00
Live flamingos & eggs	2	1	4	7 (2%)	4.07	2	0.13
Total	414	168	396				

Table 5: Extraction of Resources by Socio-Demographic Variables of the Local Residents

Cross tab	**Variables**					χ^2	**df**	**p-value**
Dependency*origin	*Origin* (n=282)	*Natives* 222	*Immigrants* 60			8.01	1	0.05
Dependency*sex	*Sex* (n=282)	*Females* 101	*Males* 181			1.76	1	0.05
Dependency*Age	*Age group* (n=282)	*18-30* 23	*31-45* 79	*45-60* 135	*>60* 45	3.24	3	0.08
Dependency*Education	*Education* (n=282)	*No formal/Little education* 150	*Primary* 122	*Secondary and above* 10		9.36	4	0.02
Dependency*Household size	*Household Size* (n=282)	*<5* 58	*5-10* 176	*>10* 48		5.40	4	0.24
Dependency*Income	*Annual Income(US$)* (n=282)	*<1,000* 168	*1,000-2,000* 55	*2,000-3000* 34	*>3000* 25	20.34	5	0.30

Table 6: Main Economic Activities Adopted by Local Residents and their Annual Incomes in US$ Across the Study Villages

Income activity	Engaresero village n=105			I/sapukin Village n=99			Pinyinyi village n=112			Total N (%)	Total income	%of total
	N*	Total Income	Average income	N	Total income	Average income	N	Total Income	Average income			
Livestock keeping	84	77,746	1,051	98	88,208	900	92	74,100	805	264(84)	240,054	52.1
Mineral mining	55	18,832	342	36	12,981	360	64	26,028	391	155(49)	57,841	12.5
Retail trade(Natural products	11	4,210	383	4	310	78	17	5,800	341	32(10)	10,320	2.2
Trade (other items	20	7,556	378	53	12,400	233	2	240	120	75(24)	20,196	4.3
Agriculture	12	9,150	763	6	1,156	193	60	46,102	818	78(25)	56,408	12.2
Tourism												
Tour guiding	29	22,906	989	-	-	-	-	-	-	-	-	
Handcrafts	7	846	56	-	-	-	-	-	-	-	-	
Camp staff	18	25,125	1395	-	-	-	-	-	-	-	-	
camp owner	2	7,375	3687	-	-	-	-	-	-	-	-	
Tourism total	56	56,352	1004	-	-	-	-	-	-	56 (18)	56,352	12.2
Salaried employment(excluding tourism income)	6	13,800	2300	0	-	-	7	7065	1009	13(4)	20,865	4.5
Remittance	2	96	48	5	340	68	2	108	54	9(3)	544	0.11
Wage labour	1	156	-	0	-	-	2	206	103	3(1)	363	0.07
Total			**11,196**			**1,832**			**3,741**		**462,943**	

*=number of respondents

Table 7:Economic Activities of the Local Residents by Socio-Demographic Characteristics

Variable	Income activities											
	Livestock keeping		Crop farming		Mining		Eco-tourism		Retail trading		**Other	
	N*	χ^2 (p-value)	N	χ^2 (p-value)	N	χ^2 (p-value)	N	χ^2 (p-value)	N	χ^2 (p-value)	N	χ^2 (p-value)
Village												
E/resero	84	30.3(0.07)	10	83.10(0.00)	55	1.38(0.50)	56	-	31	83.56(0.06)	16	22.53(0.05)
Sapukin	98		6		36		0		57			
Pinyinyi	92		60		64		0		19			
Origin												
Native	214	76.03(0.00)	41	14.53 (0.07)	88	3.80 (0.09)	25	0.87 (0.03)	44	6.65 (0.04)	5	8.90(0.05)
Immigrant	50		35		67		31		63		11	
Sex												
Female	84	4.40 (0.50)	20	1.79(0.18)	41	2.9(0.57)	13	2.7(0.04)	62	6.3(0.06)	6	1.13(0.06)
Male	180		56		114		43		45		10	

*=number of respondents

**=Formal salary employment, wage labour

Reason	Engaresero (n=105)							I/Sapukin (n=99)							Pinyinyi (n=112)						
	1 N*	2 N	3 N	4 N	5 N	Mean**	SD	1 N	2 N	3 N	4 N	5 N	Mean	SD	1 N	2 N	3 N	4 N	5 N	Mean	SD
Perceived benefits																					
Provides job opportunities	3	28	18	45	11	2.98	1.02	48	47	3	0	0	2.01	0.81	34	75	3	0	0	2.11	1.40
Better social infrastructures	3	7	17	51	20	3.81	0.62	39	51	7	2	0	2.06	0.87	29	55	15	13	0	2.25	0.93
More availability of medical and educational opportunities	2	5	9	41	34	4.11	1.27	29	56	13	1	0	2.18	0.75	7	18	54	30	3	2.40	0.67
Perceived social cost																					
Negatively influenced traditions and cultures	28	48	12	11	6	1.52	1.05	61	36	2	0	0	1.05	0.66	45	60	7	0	0	1.32	0.31
Caused immigration and crowding problems	2	4	15	60	25	3.52	1.67	39	57	3	0	0	1.09	0.96	17	72	18	5	0	2.45	0.56
Increased cost of living	21	64	3	13	4	1.96	1.23	81	18	0	0	0	1.02	0.20	71	41	0	0	0	1.05	0.37

1(Strongly Disagree) to 5 (Strongly Agree).

*=number of respondents

**The higher the mean score, the stronger the agreement