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Attitudes and Perceptions of the Local Community Towards Conservation in Maze National Park, Southern Ethiopia

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Abstract
An investigation on the attitudes and perceptions of the local community towards conservation were carried out in Maze National Park, southern Ethiopia, during April 2011 to February 2012. The study was made through household questionnaire survey, direct observation, group discussion, key informant interviews and the recorded data from the Park office. The majority (55.65%) of the respondents had negative attitude towards the wildlife and 18.26% were indifferent towards the conservation area. Wild animals such as lions (*Panthera leo*) were killed by revenge measures due to livestock loss and crop raiding problems. Awareness creation on the significant values of the newly established National Park to enhance the perception of the local community towards the biodiversity conservation effort is the immediate and crucial task of the Park management and other concerned stakeholders to alleviate the existing serious problems.
Keywords: Attitude, Awareness creation, Crop raiding, Livestock predation, Community, Wildlife

INTRODUCTION

Human-wildlife conflict (HWC) is a challenging and an increasingly significant obstacle to the conservation of many wildlife species (Madden, 2008; Dickman, 2010). HWC occurs when humans or wildlife harm or threaten one another in the course of pursuing their needs or interests. It includes cases where wildlife threatens, attacks, injures, or kills humans, or destroys their livestock, crops or property. HWC also occurs when humans deliberately injure, abuse, or kill wildlife because of perceived or actual threats to their property, livelihoods, lifestyle, person, or family (Madden, 2008). Traditionally, human-wildlife conflict was seen as a situation where wildlife impacted on human interests, such as when the resource demands of humans and wildlife overlapped (Peterson *et al*., 2010; White and Ward, 2010). It is increasingly recognized, however, that what may appear as conflict between humans and wildlife may more often be conflict between groups of people with different values, perspectives and objectives for wildlife (Marshall *et al*., 2007).

Hence human-wildlife conflicts represent complex interpersonal conflict that emerges from people's attributions and interpretations of a situation rather than simply resulting from negative interactions with wildlife (Marshall *et al*., 2007)**.** The intrinsically social nature of human-wildlife conflicts must be addressed in the course of research and management in order for conflict to be effectively resolved (White *et al*., 2009). Effective and socially acceptable strategies for conflict management and wildlife conservation need to take into consideration peoples' behaviours, attitudes and perceptions (Dowle and Deane, 2009); hence social research is a vital first step in the management of wildlife conflicts.

Understanding how people interact with wildlife may lead to a greater appreciation of the causes and consequences of problems and the potential solutions. For example, human behaviours, such as providing supplementary food or failing to secure refuse, may cause or exacerbate wildlife problems. Once quantified and understood, negative attitudes or behaviours can be targeted for change. For example, enhancing people's appreciation for wildlife and the non-tangible benefits wildlife provides can change people's perception of a species and may be an effective tool for mitigating conflict by increasing tolerance of wildlife problems (Messmer, 2000). One of the most common concepts explored in human dimensions of wildlife research is attitude (Manfredo, 2008). Attitudes can be influenced by beliefs and experiences (Homer and Kahle, 1988), vary depending on the context or situation (Ajzen and Fishbein, 1980) and often change over time (Jonker *et al*., 2006). A person's attitudes are formed through a variety of factors, including knowledge, beliefs, values, direct experience and cultural norms (Dickman, 2010).

Biodiversity awareness, which can include species-specific and ecological knowledge and awareness of biodiversity issues and threats, may be an important predictor of a person's attitude towards wildlife. The value people place on wildlife often depends strongly on their knowledge of them (Macdonald and Service, 2007) and higher levels of knowledge about a wildlife species has been linked to more positive attitudes towards that species (Kaczensky *et al*., 2004; Bath *et al*., 2008). Consorte-McCrea (2011) found that low levels of knowledge about the maned wolf (*Chrysocyon brachyurus*) were related to decrease positive and increase negative attitudes towards the species. Ecological awareness has also been linked to lower levels of dominionistic, negativistic and utilitarian attitudes towards the environment (Yore and Boyer, 1997). Similarly, an awareness of the rarity of a species and the factors that threaten its survival may lead to more positive attitudes towards a wildlife species

(Kaczensky *et al*., 2004; Sillero-Zubiri *et al*., 2004). Consorte-McCrea (2011) described that, higher levels of wildlife knowledge and awareness may also result in more positive attitudes towards biodiversity conservation more generally. The purpose of this investigation is to identify the awareness and attitude of the local community towards the conservation effort made in the recently established Maze National Park, Ethiopia and to propose the possible solution for the sustainability of such potentially wildlife rich conservation area.

MATERIALS AND METHODS

The study area

This research was carried out in the newly established Maze National Park (MNP), southern Ethiopia. The Park was established by the regional state in 2005. It is about 485 km southwest of the capital Addis Ababa passing through Wolaita Sodo town. It is situated between x=286484.25 and y=671467.31 latitude and x=300963.36 and 696852.69 longitude. The Park is surrounded by chains of mountains and bounded to the north by Quecha Wereda, to the northwest by Omo River and Gofa Wereda, to the west by Zalla Wereda, to the east by Deramalo Wereda and to the south by Kemba Wereda. The altitude ranges from 998 to 1200 m above sea level and covers an area of 220 km^2.

Rainfall at Maze (Morka area), although continuous has a moderately bimodal pattern, typical of semi-arid agro-ecological zone of Ethiopia. The annual rainfall varies between 843.8 mm and 1375.3 mm. Maze area experiences a long rainy season that extends from April to October with the highest peak towards the end. The dry season is from November to February (ENMA 1995-2009 Meteorological data). The lowest temperature recorded during the wet season was 17.6°C in June and the highest during the dry season 33.9°C in February.

Methods

This research is mainly based on primary data which is obtained through household survey, direct observation, group discussion and key informant interviews. Secondary data were collected from the recorded data by the Park and neighboring Wereda offices. A standard questionnaire and focus group discussion or semi-structured questionnaire were designed and carried out with the sample households of the local people. The questionnaires included both open-ended and fixed response questions. The questionnaire was also pre-checked among some groups of the communities, which was not included in the main sampled groups. Twenty households were selected randomly for the pilot survey; after which the necessary improvements were made in the questionnaire. These pilot questions were not considered in the result analysis. The questionnaire survey was conducted within 0 to 5 km range from the Park boundary. 30% of the households were randomly selected from four closest Kebele or villages, such as Masha Morka 28.70% (n=66), Masha Chaba 36.96% (n=85), Domaa Omala 14.34% (n=33) and Wagesho Kebele 20.00% (n=46) of the surrounding Wereda based on the distance from the Park boundary and their impact on the conservation area following the work of Newmark *et al*. (1994). Local Kebele people were involved in the research to facilitate the data collection. Questions were addressed to household heads to gather demographic data, way of utilization of the Park resources, crops grown, damage caused to crops and livestock, and the species of wildlife responsible for the damages, protection measures adopted, livestock type, number killed by wildlife and knowledge and attitudes of local communities towards wildlife and the Park management.

Most of the questionnaires were individually administered, primarily with the head of the household, of which mostly were male. The exception was where they were absent during the household visit. In many cases, other family members also participated to form a collective response. Interviewees were met at their home and roughly 35 to 50 minutes of time was required for an interview, depending to the respondents. If a household member 18 years of age or older was absent during the survey request, that house was skipped and the next house was approached. The interview was conducted during April 2011to February 2012. Several secondary data were also obtained from the National Park Archives and were verified through key person interviews like Park scouts and community representatives. Each of the questionnaire data was analyzed using descriptive statistics and responses compared using Chi-square test.

RESULTS AND DISCUSSION

Concerning knowledge of the local community about the objectives of conservation of wildlife and their habitats in Maze National Park, 45.22% (n=104) of the respondents had a good knowledge of conservation objective, whereas 54.78% (n=126) had no understanding. Most (31.73%, n=33) know the purpose for wildlife protection (Table 1). There was a significant difference among the respondents in the understanding of the purpose of the establishment of the conservation area ($\chi 2$=65.538, df=7, $p<0.05$). Most (31.73%, n=33) obtained the knowledge from the Park management awareness creation program. Among the uninformed respondents 57.14% (n=72) will be interested to know in the future, whereas 42.86% (n=54) will not be interested to know. Some of the respondents were not willing to respond and others were not happy on the establishment of the Park, because due to its establishment they lost their farmland without compensation.

Table 1 Knowledge and understanding of the respondents on the purpose of conservation area

Purpose	Number of respondents	Percentage
For wildlife protection	33	31.73
For tourist attraction	21	20.19
For wildlife conservation and tourist attraction	20	19.23
To conserve nature	14	13.46
Government property	7	6.73
To get job opportunity	4	3.85
To save natural resources for the coming generation	3	2.88
To feed on the wildlife during drought	2	1.93
Total	N=104	100.00

Majority (55.65%, n=128) had negative attitude, 26.09% (n=60) positive attitude and 18.26% (n=42) indifferent towards the establishment of the conservation area in their surroundings. There was a significant difference among the respondents on the attitude towards the conservation of wildlife and their habitats ($p<0.05$). Most of the positive attitude responders (38.33%, n=23) reasoned out that, it will be important to save for the future generation (Table 2). There was a significant difference among the reasons for the positive attitude responders ($\chi2=18.833$, df=4, $p<0.05$).

Many of the negative attitude respondents (33.59%, n=43) reasoned out that, they were hindered from free utilization of the wild resources for their own and livestock. Others responded that, because of they are angry with predators attack on the livestock and crop damage (28.13%, n=36), loss of their farmland with permanent crops (21.87%, n=28), lost and damaged properties by the Park scouts (4.69%, n=6) and with unknown reason (11.72%, n=15). There was a significant difference among the reasons for the negative attitude respondents ($\chi2=35.672$, df=4, $p<0.05$). Among the indifferent respondents 26.19% (n=11) reasoned out that they suspect the mission of the interview and 73.81% (n=31) had no response.

Table 2 Reasons for the positive attitudes towards the conservation

Reason	Number of respondents	Percentage
To save for generation	23	38.33
To attract future tourists	16	26.67
To save wildlife and forests	10	16.67
To mitigate global climate change	6	10.00
For sustainable use of natural resources	5	8.33
Total	N=60	100.00

Most (88.70%, n=204) of the respondents had faced serious problems with wildlife existing in the Park. Many (48.53%, n=99) faced crop damage and livestock loss, 30.39% (n=62) only crop damage and 21.08% (n=43) only livestock loss. There were no response to the damage caused to humans and disease transmitted from wildlife to their livestock. There was a significant difference among the kind of damage by the wildlife ($p<0.05$). Almost all of the respondents agreed that the animals responsible for crop damage were mainly warthog, baboon, monkey, porcupine, bush pig and duiker, and the responsible predators were lion, leopard, hyaena, jackal and wild dog. Respondents did not report the cases of wildlife problems to anybody, because they did not know where they have to report and get urgent solution. The frequency of appearance of the predators in the respondent's area was very common for a lion, rare for a leopard and hyaena, common for a jackal and very rare for the wild dog. Most (32.35%, n=66) used nothing to control the wildlife from attack nor called or reported to the warden or scouts of the Park (Table 3). There was a significant difference among the control measures used by the respondents ($\chi2=92.814$, df=6, $p<0.05$).

90.43% (n=208) knew their livestock was killed by predators. They listed that about 142 ox, 143 cows, 56 calves and 15 goats were killed by lions; 18 calves and 45 goats attacked by leopards, 48 cows and 114 calves by hyaenas, and 24 goats attacked by jackals, during the last five years (Table 4). 59.13% (n=123) responded that, the livestock were attacked during the night and/or late afternoon. 73.08% (n=152) did not take any measure when their livestock was attacked while, 11.54% (n=24) used poison to revenge and kill the predators. According to the Maze National Park Office and information from the local people, during this research period 13 wild animals were killed due to revenge measures by the community. Of these, four lions (30.78%) were poisoned in revenge to their livestock (Fig 1). Besides, 6 wild pigs, 2 warthogs and one vervet monkey were also killed in revenge to their crop damage.

Table 3 Control measures used by local people to safeguard crop damage and livestock losses

Control measure	Number of respondents	Percentage
Nothing	66	32.35
Killing with poison	12	5.88
Killing using snares	29	14.23
Killing by poison and snares	10	4.90
Using repellents (dog, shouting)	50	24.51
Changing type of crop cultivated	15	7.35
Changing the route of livestock	22	10.78
Total	N=204	100.00

Table 4 Livestock killed by predators during the last five years

	Number attacked by predators				
Livestock	Lions	Leopards	Hyenas	Jackals	Total
Oxen	142	-	-	-	142
Cows	143	-	48	-	191
Calves	56	18	114	-	188
Goats	15	45	-	24	84
Total	356	63	162	24	605

Local communities living in the surrounding area used to encroach into the Park area for agricultural land for a long period of time before the establishment of the Park. Especially, the people from Daramalo Wereda, Domaa Omala Kebele at Domaa village had been practicing illegal farming in the Park area, along Domba Valley (Maya Shucha River) up to Maze Bridge following the river bank prior to 2008. They were farming a variety of crops like maize, banana, mango and avocado trees. Even after the establishment of the Park the encroachment had continued, though at a slower rate. According to the information from the Park office, illegal farming still occurring towards Kucha Wereda, Morka Kebele about 3-5 hectares of land, around the border of Daramalo Wereda, Doma-Omalla Kebele by the people coming from Kemba Wereda, Hanika Passa Kebele farm unlimited hectares of land along Maze River.

A/ **B/**

Fig 1 A/ Livestock killed by lions and B/ lions killed by poisonous chemicals

Due to these illegal activities, the people from Doma-Omalla Kebele have asked to utilize the land along the rivers. In addition to these, the people from Zala Wereda, Melagayle Tosa Kebele had been practicing such illegal farming activities. However, after the discussion with the Kebele Administration Office together with the Park Management Office and the local community, this farming practice has been halted. Although, encroachment to the Park has been brought under control to a certain extent, in some parts of the Park area, potential encroachment in the future poses a major threat to the Park as demand for more land increases.

Most of the respondents had a negative attitude towards the conservation of wildlife in the Park area; mainly due to hindrance from free resource utilization in the wild, angry with predator attack to their livestock and loss of their previous owned farmlands with permanent crops without getting compensation. Papageorgiou and Vogiatzakis (2006) gave emphasis on the importance of using local people's perceptions as an input for designing and applying appropriate management plans for sustainable development, particularly in protected areas. Weaver and Lawton (2008) explained that the perceptions of local people, who are in a special position to protect or undermine nearby protected areas depending on the decisions they make about the use of their own property, the activities they undertake, legally or illegally, and the degree to which they choose to oppose, support, or ignore the potentially destructive actions of others. So, providing education that increases

environmental awareness and informing local communities with information about environmental issues, activities and decisions are a crucial key to the success in MNP management. The local community also needs to share directly the income gained from tourists, in order to develop a positive attitude towards the establishment of the Park and conservation of wildlife. At present, many countries have a legislation to ensure local communities benefit directly from revenues. According to Gandariasbeitia (2010), tourism encouragement is a reasonable approach within a National Park as revenues derived from tourism is one of the principal benefits. Williamson (2006) described that ecotourism has the potential to make a substantial positive contribution to the management and conservation of wildlife and their habitat, and improves the well-being of the local people. In addition, due to the diversified challenges observed in this newly established park, the support of concerned bodies and stakeholders is mandatory to establish well organized management system with the collaboration of the local community. It is vital, therefore, to understand the perceptions of the local people that are primarily affected by conservation related regulations.

Livestock predation and crop raiding by the wildlife are the most important causes of conflict in Maze National Park. Majority (88.70%) of the respondents faced serious problems due to the wildlife existing in the Park area by both livestock predation and crop damage. Newmark *et al*. (1994) mentioned that, in several parts of Africa, the conflict between local community and wildlife is the most serious trouble if they are live near protected area. Ogada *et al.* (2003) stated that wildlife most exposed to the conflict is more susceptible to extinction because of injury and death caused by humans. These can be either accidental, such as road traffic, capture in snares set for other species or from falling into farm wells, or intentional, caused by shooting, poison or capture. According to Treves and Karanth (2003), the utilization of domestic guard dogs appears to be a successful strategy for managing predation risk. During the present study, the majority of the respondents were not used keeping dogs to the safeguard livestock. The conservation attitude of local communities living adjacent to the protected areas is highly influenced by the problems associated with wildlife. People living surrounding the protected areas that are unable to control the losses caused by wildlife are likely to develop negative attitude towards wildlife (Newmark *et al*., 1994). Bajracharya *et al*. (2006) and Esilaba *et al*. (2007) stated that there is a need for pastoralists to participate in conflict resolution and decision-making processes pertaining to sustainable use and conservation of wildlife. Conflicts that have been occurring between the adjacent community and wildlife in the Maze National Park shall be minimized and, peaceful coexistence between humans and conservation of wildlife enhanced, if the pastoral communities are actively involved in conflict resolution and Park management processes. A participatory approach to management of wildlife should be developed within MNP, if conflicts between local communities and the National Park management are to be avoided in the future.

Another source of conflict between locals and the Park management is the encroachment of the community and illegal exploitation of Park resources. This activity might be due to the long period interaction of the local community with the natural habitat for free access of resource exploitation without any hindrance before the establishment of the area. One of the great challenges of wildlife in MNP area is illegal hunting. Both the local people and other intruders have practiced poaching of wildlife for food and other traditional marriage purposes. Such illegal hunting activity for bush meat still persists in most of the Kebeles. Mesochina *et al*. (2003) explained that poaching is the main cause of decline or extinction of desert antelopes. The traditional hunters, such as the Malie tribes come from distant Woredas, to poach on African buffalo for the purpose of getting wife through traditional marriage and to get honour. During the period of their stay in the Park, they also kill other wildlife to obtain food, skin and horn. The selective poaching had caused dwindle the number of buffaloes. Such illegal hunting practice does not only affect the safety of the wildlife but also disrupt the normal and seasonal scientific investigation of the researchers.

In general, this study indicates the need for the park management to involve the local community more in conservation of wildlife around MNP. It emphasizes the potential negative effect of depredation of livestock and people that reduces local tolerance for wildlife leading to revenge killings of carnivores, and also hampers conservation efforts in broad. Awareness creation on the significant values of the wildlife resources in the newly established Maze National Park to enhance the perception of the local community towards the biodiversity conservation effort is the immediate and crucial task of the Park management and other concerned stakeholders to alleviate the existing serious problems of the area.

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