

Full Length Research Paper

Attitudes and perceptions of the local people towards benefits and conflicts they get from conservation of the Bale Mountains National Park and Mountain Nyala (*Tragelaphus buxtoni*), Ethiopia

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A study to examine the attitudes and awareness of the local communities towards conservation values of the park, its flora and fauna with particular emphasis on mountain nyala was carried out in the Bale Mountains National Park in 2007. The study specifically investigated how attitudes vary with different groups of people involved in either recent or long term settlements; people with different livelihood strategies and among people that live at different distances away from the park. Questionnaire and interviews were directed to randomly selected households and key-informants in 7 villages located near the park. Out of the 136 people interviewed, 26% of the respondents felt that they benefited, while 55% experienced conflict by living near the park. The most important benefits were leasing of horses to tourists (62%), serving as tourist guide (44%), and use of the park's vehicles during the time of emergency (38%). A significant portion (83%) of the respondents agreed that there was lack of equity in benefit distribution. The main conflicts were fear of forceful relocation (84%), livestock grazing restrictions (74%) and restriction of firewood collection (54%). Perceived benefits and conflicts varied across livelihood strategy but not proximity to the park and duration of settlement. The majority of respondents (66%) believed that their presence in the area does not contribute to habitat degradation, an attitude more commonly held among recent settlers than long-term settlers. The overall attitude of the local people towards the park and the presence of mountain nyala were positive. 80% of the respondents would support the park's conservation activities suggesting that there is a room to enhance cooperation of the local people and improve the prospects for conservation of the mountain nyala and its habitat.

Key words: Attitude, benefit, conservation, conflict, encroachment, local people, mountain nyala.

INTRODUCTION

For wildlife conservation action to be effective, it is imperative to understand beyond the need of individual

wildlife species in human cultural and economic aspects that profoundly affect conservation (Naughton-Treves

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and Weber, 2001; Baillie et al., 2004). It is increasingly recognized that biodiversity is ultimately lost or conserved at the local level, and it is therefore crucial that the perspective of the local people should be understood if wildlife management programmes are to be sustainable (Pratt et al., 2004).

Information on perceptions and attitudes of local communities living in and around protected areas is important to identify management programmes and strategies that best suit the protection of biodiversity alongside the development of local community livelihoods (Heinen, 1993; Infield and Namara, 2001; Allendorf, 2007; Kideghesho et al., 2007). Moreover, understanding of the attitudes of local communities, particularly where their rural livelihoods are dependent on agriculture is vital for resolving wildlife-human conflicts, which otherwise can threaten the success of any conservation activity (De Boer and Baquete 1998; Webber et al., 2007). Based on the fact that the attitudes are a strong predictor of a person or group's intentions to behave in a particular manner such as complying with wildlife protection regulations (Fulton et al., 1996), therefore, assessing attitudes and perceptions of humans toward wildlife provides insights on the degree to which people are willing to cohabit with wildlife (Carter et al., 2013).

Conflicts between the interest of wildlife conservation and local communities over the utilization of natural resources are well documented (Robert and Martin 2003; Warner, 2000). Human-wildlife conflict is more intense in developing countries where livestock holdings and agriculture are important parts of the rural livelihoods and income (Hackel, 1999). In these regions, competition between local communities and wild animals, for the use of natural resources, is particularly intense and direct (Messmer, 2000). Wildlife can negatively affect human livelihoods where they live in close proximity (Ogada et al., 2003; Woodroffe et al., 2005; Chardonnet et al., 2010), which in turn encourage people to kill wildlife (Woodroffe et al., 2005; Kissui, 2008), degrade wildlife habitat, or not comply with regulations designed to protect wildlife (Nyhus et al., 2005). Increased exposure to wildlife-related risks has been linked to negative attitudes of local people (Newmark et al., 1993; Arjunan et al., 2006). The nature and magnitude of the human wildlife conflicts are seldom uniform across space, and vary from country to country depending on a variety of factors including human population growth, culture, conservation methods and scarcity of critical natural resources especially land and water (Obunde et al., 2005; Sitati et al., 2003; Naughton-Treves and Treves, 2005). It is widely acknowledged that crop damage and livestock predation by wildlife are major sources of economic losses (Naughton-Treves, 1998). Encroachment into wildlife areas by humans has increased almost greatly over the past few decades and often resulted in the elimination of the larger species, particularly the large mammals, and such pressures hinder the success of

species conservation programs in many regions around the world (Hackel, 1999; Woodroffe, 2001; Romanach et al., 2007; Milliken et al., 2009; Linderman et al., 2005; Lepczyk et al., 2008). Destruction of wildlife habitats has taken different forms, for example degradation, fragmentation, total loss of habitat due to the growing human activities prompted mainly by such factors such as human poverty, demographic increase, inadequate land tenure systems, lack of proper conservation and development policies and economic incentives (Kideghesho, 2007).

In Ethiopia, human-wildlife conflict is often linked to crop damage by wild animals on farms adjacent to protected areas and also by negative attitude and/or stereotype held by the exclusion of local communities towards wildlife (Kidane, 1982; Hillman, 1993; Hundessa, 1997). Moreover, exclusion-protected area approach followed by the Ethiopian Wildlife Conservation Authority has contributed its share in nurturing of negative attitude by the local people towards wildlife conservation. Widespread destruction of wildlife in 1991, during change of the government, by local communities occurred in protected areas like the Bale Mountains National Park (BMNP), partly as an expression of resentment over the exclusionary approach followed by the Ethiopian Wildlife Conservation Authority (Tedla, 1995; Beltran, 2000). So far, no attempt has been made to diagnose what went wrong and what lessons can be learned to avoid such destruction from happening again in the future. Thus, the general aim of this study was to examine the attitudes/perceptions and awareness of the local communities surrounding the northern boundary of the park towards conservation of the BMNP, its flora and fauna with particular emphasis on mountain nyala. The specific objectives were to: 1) determine and compare the types of benefits and conflicts that the local people are associated with the park's flora and fauna; 2) determine perceptions attitudes held among various groups of residents on land use/cover change, environmental/ecological services, conservation values of the park and their willingness to support the park; 3) assess in particular, the attitudes and perceptions of residents' towards mountain nyala; and 4) assess how the type of villages, their proximity to the park headquarters, duration of settlements and livelihood sources have impacted the perceptions and attitudes of local communities towards conservation of the park and mountain nyala..

The study area

The study area is located within 6°20' and 7°40'N latitude, and 39°30' and 39°58'E longitude in the southeastern highlands of Ethiopia. The area supports more than 75% of the global population of mountain nyala.

The current conservation status of the mountain nyala, as designated by IUCN (2002), is endangered due to reduced populations and continued decline. The

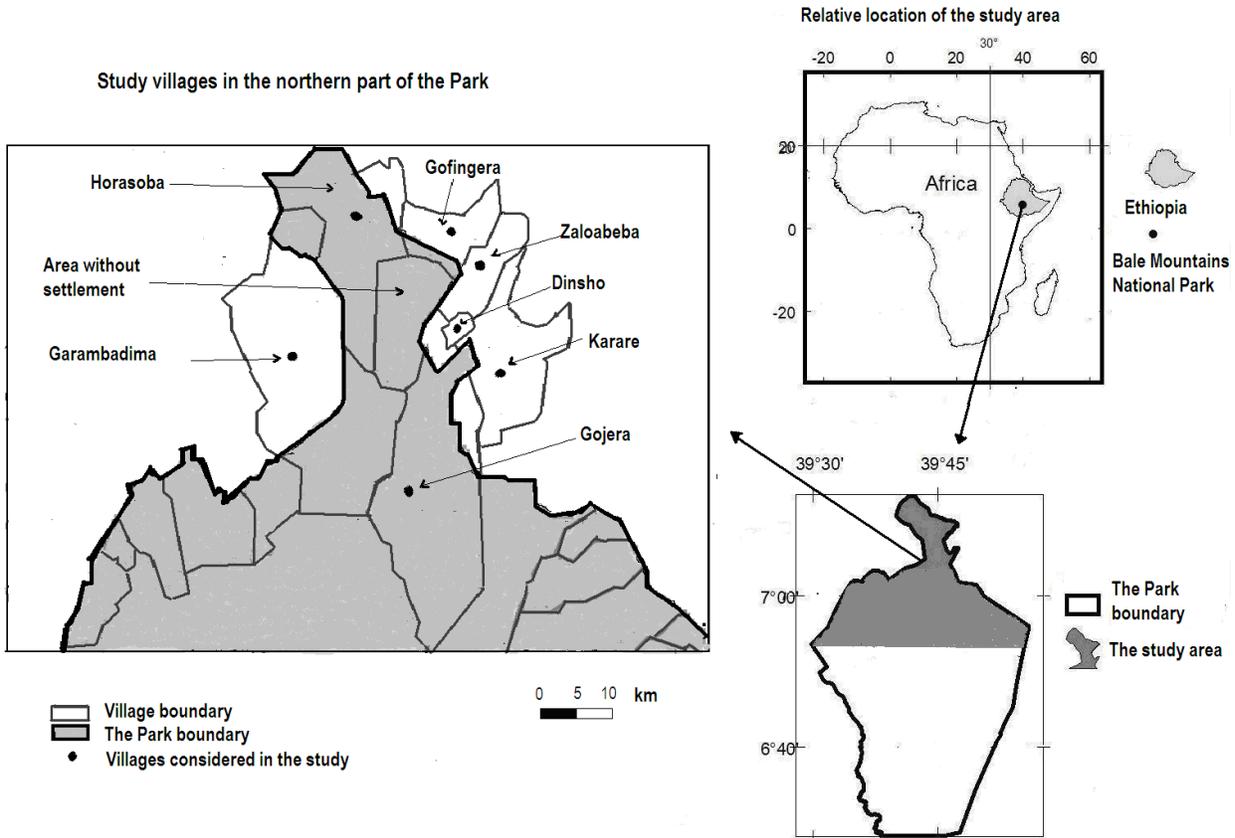


Figure 1. Map of the study area showing the different villages.

altitudinal range of the study area varies between 3000 - 3400 m asl. Seven villages or peasant associations (Dinsho, Zaloabeba, Karare, Gojera, Horasoba, Gofingera and Gerambadima) were selected that fall in and around the mountain nyala habitat range (Figure 1). Some of the villages were exclusively within the park. The focus animal, mountain nyala, was brought to the attention of science at the beginning of the 20th century (1908) by Major Ivor Buxton (Lydekker, 1911). The species is endemic to Ethiopia and under pressure due to encroachments by the local people and livestock (Hillman, 1986a).

The local people are mainly from Oromo ethnic group. They are subsistence farmers where their livelihood primarily dependent on crop cultivation and animal rearing.

The contribution of the natural resources particularly of natural forests of the area to their livelihood is crucial. More than 20,000 people settle and cultivate in and around the study area along with 50,500 heads of livestock and the trend is increasing from time to time (Tedla, 1995).

METHODS

Data were gathered using a cross-sectional survey of residents

from seven villages located within or close to the northern part of the park. Using a combination of interviews with key informants and a questionnaire to household heads, quantitative and qualitative data were collected relevant to the research objectives. Seven villages were selected after discussion with the park staff, the Kebele (the lowest administrative unit in Ethiopia) administrators and the District Agricultural Development experts to identify which villages have direct access to the northern part of the park. Geographically, these seven villages encircle the northern part of the park. The number of households residing in the villages and their names were obtained. One of the villages was small town, which was the main administrative centre of the district. From these seven villages, 5% of the heads of household (HH) out of the total 2,720 were randomly selected as respondents (N = 136). Out of a total of 136 HH considered in the survey, 97 were males and 39 females. In addition key informants, generally elderly members of the communities and conversant with the happenings in the locality were identified with the help of Kebele administrators and villagers. Two key informants were interviewed for each village. A checklist of questions/issues was developed to guide the interview and discussion with the key informants.

A combination of closed and open-ended questions was developed and pre-tested before administering it to the intended household heads. The questionnaire was designed to query residents about a range of issues concerning their settlement history, benefits obtained and conflicts faced due to the PARK, views on land cover change, conservation values of the park and local knowledge and perceptions about mountain nyala. The questionnaire was translated into the local language and enumerators, with good knowledge of the local language (Oromifa), were selected to administer the questionnaire. Since the respon-

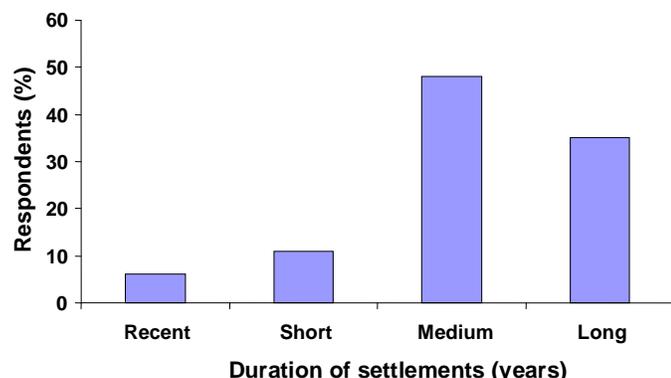


Figure 2. Proportion of residents settled in the area for different durations [Recent (<10 years), Short (10-20 years), Medium (21-40 years) and Long (>40 years)].

dents were illiterate, the enumerators read and explained each questions to the respondents and recorded their response in writing. The differentiation in the nature of the benefit types obtained by residents was made during the pre-test exercise of the questionnaire. Accordingly, two categories were identified: 1) Authorized or direct benefits; and 2) Unauthorized benefits. The data were summarized, analyzed using non-parametric tests by using SPSS version 14 statistical software.

RESULTS

The average family size of the respondents was 8.3 (95%CI = 7.6 – 9.0) and differed among villages ($F = 2.062$, $df = 6$, $P = 0.062$). The highest family size was observed in Dinsho and Zaloabeba with 9.8 and 9.6, respectively, while the lowest was in Gojera at 6.7. The average number of children per family was 6.4 and varied from 5.8 to 7.1 and was marginally different across villages ($F = 2.073$, $df = 6$, $P = 0.061$). Ages of the respondents varied between 18-90 years. Among the respondents, 61, 19, 17 and 3% were married, widowed, divorced and single respectively. On average, 67% of the respondents across the seven villages were permanent settlers, 25% were seasonal and the rest (8%) practice both (Figure 2). All the respondents in Dinsho were permanent settlers. The highest number of residents that use seasonal settlements and move between areas was recorded in Gofingera (60%) and Zaloabeba (52%). Duration of settlements is significantly different among the villages ($\chi^2 = 12.668$, $df = 6$, $P < 0.05$). Recent and short term settlers were observed in villages that are very close to the park headquarters, of which Dinsho and Gofingera each supports 20% and Karare 12%, Gojera 6% and Garambadima 5%. Horasoba (57%) and Zaloabeba (57%) villages supported the highest number of settlers residing over 40 years (long term settlement).

A clear majority (72%) of the respondents preferred to stay in the area in the future and their views were not significantly different across villages ($\chi^2 = 12.801$, $df = 6$,

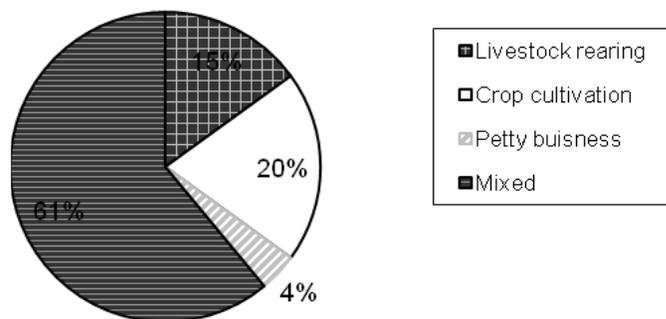


Figure 3. Livelihood sources of the local communities.

$P > 0.05$). Respondents from Garambadima were different from the others with only 40% expressing the desire to stay. The majority of the respondents (58%) were against the idea of relocation and only about a third (32%) supported the idea, while the rest (10%) were unsure about its benefits. Their views were not significantly different across villages ($\chi^2 = 11.486$, $df = 6$, $P > 0.05$). The most important views against the idea of relocation were: they will become economically poor and dependent; difficulty in adapting to the new environment; their harmonious relationship with the mountain nyala and other animals will be affected; they fear enough land will not be available for re-settlers; and they wish to stay on the land of their ancestors. Subsistence agriculture was the dominant livelihood activity of the communities. The farming system involved complex linkages between crop production and livestock rearing. The majority of the households practice settled and mixed agriculture, producing crops and rearing livestock, followed by only crop cultivation (Figure 3).

The major types of livestock holdings were sheep and cattle. Each household on average has 10 heads of sheep and 8 cattle. The cattle ($\chi^2 = 13.950$, $df = 6$, $P < 0.05$) and sheep ($\chi^2 = 20.751$, $df = 6$, $P < 0.01$) holding size were significantly different across villages at 0.05 level. On average, 87, 78, 72, 71, 44 and 21% of the households were owners of cattle, horses, dogs, sheep, goats and donkeys, respectively. The highest number (15) of cattle per household was observed in Karare village, which was one of the closest villages to the park boundary.

58,000 heads of livestock and transport animals were roaming in and around the northern parts of BMNP. Nearly three quarter (74%) of the respondents wished to have more livestock than they have at present, although 78% of them experienced shortage of feed for their livestock. Their desire to have high number of livestock was significantly different across the villages ($\chi^2 = 17.986$, $df = 6$, $P < 0.01$), while their opinion on shortage of feed showed no significant difference ($\chi^2 = 6.272$, $df = 6$, $P > 0.05$). About 73% of the respondents felt that they rear or keep livestock mainly for reason of insurance in time of crop failure rather than to signify their status, which was

Table 1. Perceived benefits and conflicts by the local communities ($n=136$) from the park.

Local communities	Perceived benefits	Perceived conflicts
Across villages (df = 6)	$\chi^2 = 26.550$; $P = 0.000^*$	$\chi^2 = 10.576$; $P = 0.102$
Across distance (df = 2)	$\chi^2 = 3.977$; $P = 0.134$	$\chi^2 = 6.030$; $P = 0.049$
Settlement duration (df = 3)	$\chi^2 = 1.443$; $P = 0.695$	$\chi^2 = 1.724$; $P = 0.632$
Livelihood source (df = 3)	$\chi^2 = 21.862$; $P = 0.000^*$	$\chi^2 = 10.720$; $P = 0.013^{**}$

*Significant at 0.01, **Significant at 0.05 level.

about 4%. Their views were significantly different across villages ($\chi^2=20.948$, $df = 6$, $P <0.01$) with lowest number of respondents who rear livestock for insurance recorded in Dinsho villages (47%); while the highest in Karare (94%) and Garambadima (95%) villages. Those local communities relatively close to the Park boundary, mainly Karare (94%) and Zaloabeba (81%), desire to have and/or own relatively more cattle in the future than they have at present as compared to the rest of the villages. However, Garambadima, which is the farthest village with a similarly high percentage of the respondents (95%) indicated a desire for more livestock in the future. The dominant type of feed source for livestock was free range grazing on communal lands (79%), followed by seasonal grazing (35%) based on the availability of feed. However, the sources of feeds for livestock were different across villages except for free grazing. Cut and carry ($\chi^2=59.419$, $df = 6$, $P <0.01$) and seasonal grazing ($\chi^2=20.392$, $df = 6$, $P <0.01$) practices adopted by the communities were significantly different across villages.

Attitude of settlers towards dogs as shepherds of their livestock was evident from the number of dogs they own. More than 3,500 dogs have been estimated during the present study. On average, 2 dogs were owned by each household. Most of them were untamed and have been observed ranging freely in the wild and sometimes chasing mountain nyala calves. When they are in groups, they were also observed occasionally chasing adult mountain nyala. The local people also rarely associate dogs with the risk of disease transmission such as rabies to wild animals.

Perceived benefits were significantly influenced by the types of villages and livelihood sources than other group variables, that is, distance and duration of settlements (Table 1). Sources of livelihood appeared to be important group variables to have significant influence on perceived benefits and conflicts by the local people (Table 1). About a quarter (26%) of the respondents felt that they benefited while more than half (55%) experienced conflict by living near the park. The frequencies of conflicts by the local communities were similar across villages, proximity and settlement duration except for livelihood source; while perceived benefits were significantly different across villages and livelihood source (Table 1). With regard to livelihood strategy, those who principally

depended on livestock rearing faced higher incidences (75%) of conflicts than mixed farming (57%) and crop cultivators (44%); and petty business with no reports of incidences of conflicts. The most beneficiaries from the park were those who depended on petty business (100%) and livestock rearing (35%), followed by mixed farming (27%) and crop cultivators (4%).

The majority of Dinsho village residents (68%) and the least (10%) in Garambadima felt that they have benefited a lot from the park. Large proportion of respondents (78%) from Gojera experienced more incidences of conflicts, while the least (47%) were reported from Karare villages. However, Karare village residents had more than double (15.2 cattle per HH) herds of cattle owned by residents such as in Zaloabeba (5.9). As distance increased from the park headquarters, perceived benefits and conflicts by the communities decreased. Recent (38%) and short-term (36%) settlers felt that they get more benefits than medium (26%) and long-term settlers (23%). Short-term settlers experienced more conflict (71%) than the recent settlers (50%). Views on conflicts ($\chi^2 = 1.724$, $df = 3$, $P >0.05$) and benefits ($\chi^2 = 1.443$, $df = 3$, $P >0.05$) across settlement duration were not different.

The most frequently mentioned benefits were horse lease (62%), tourism (44%) and use of the park vehicles during the time of emergency (38%). The least cited benefits were employment (15%) and infrastructure development (13%) (Table 2). Benefits obtained in terms of employment opportunity including the NGO's, leasing horses, serving as tourist guide and use of park vehicles during the time of emergency were different across the village and proximity to the park (Table 2). High proportion of respondents from Dinsho (45%) and Gofingera (21%) villages had employment opportunities as their benefits. More respondents residing very close to the park headquarters obtained more benefits than those residing faraway.

Village types and proximity of villages to the park headquarters influenced perceptions of the local communities towards authorized benefits as compared to other categories (Table 2). The perceptions of local communities were more variable and diverse towards authorized benefits than unauthorized ones (Tables 2 and 3).

From the customary benefit category, the most

Table 2. Perceived benefits (externally demanded benefits) by the local communities from the park.

Benefit type	Percentage that responded positively	Across Villages (df = 6)	Across proximity (df = 2)	Settlement duration (df = 3)	Livelihood source (df = 3)
Employment opportunities	15	X ² =22.780 P=0.001**	X ² =12.181 P=0.002**	X ² =1.523 P=0.677	X ² =2.389 P=0.496
Leasing horses	62	X ² =28.829 P=0.000*	X ² =21.591 P=0.000*	X ² =1.681 P=0.641	X ² =0.166 P=0.983
Tourist guide	44	X ² =18.792 P=0.005**	X ² =15.314 P=0.000*	X ² =11.014 P=0.012	X ² =2.428 P=0.489
Infrastructure development	13	X ² =6.035 P=0.419	X ² =3.403 P=0.182	X ² =2.156 P=0.541	X ² =19.113 P=0.000*
Employment by NGOs (EWCP)	37	X ² =17.496 P=0.008**	X ² =9.547 P=0.008**	X ² =1.234 P=0.745	X ² =1.653 P=0.648
Use of park vehicles	38	X ² =46.301 P=0.000*	X ² =41.092 P=0.000*	X ² =3.237 P=0.357	X ² =4.217 P=0.239

*Significant at 0.01 level, **Significant at 0.05 level

Table 3. Perceived benefits (customary benefits) by the local communities from wildlife of the park.

Benefit types	Percentage that responded positively	Across villages (df= 6)	Across proximity (df=2)	Settlement duration (df =3)	Livelihood Source (df =3)
Firewood collection	31	X ² =8.256 P=0.220	X ² =2.495 P=0.287	X ² =0.438 P=0.932	X ² =6.266 P=0.099
Construction materials extraction	15	X ² =8.643 P=0.195	X ² =0.930 P=0.628	X ² =1.234 P=0.745	X ² =5.540 P=0.136
Extraction of non-wood forest products	12	X ² =0.523 P=0.998	X ² =0.619 P=0.734	X ² =2.697 P=0.441	X ² =2.807 P=0.422
Grazing land	74	X ² =5.398 P=0.494	X ² =1.400 P=0.497	X ² =4.540 P=0.209	X ² =0.518 P=0.915
Cultivation land	4	X ² =13.362 P=0.038*	X ² =1.130 P=0.568	X ² =1.064 P=0.786	X ² =3.597 P=0.308
Extraction of fodder	15	X ² =7.180 P=0.305	X ² =0.337 P=0.845	X ² =2.107 P=0.550	X ² =0.488 P=0.921
Extraction of Bush meat	2	X ² =5.440 P=0.489	X ² =0.664 P=0.717	X ² =1.812 P=0.612	X ² =1.338 P=0.720

*Significant at 0.05 level.

frequently cited benefits were the source of grazing land (74%) and fuel wood collection (31%). While the least cited includes extraction of non-wood forest products (12%), land for cultivation (4%) and bush meat extraction (2%). The highest proportion of respondents who cited firewood as important benefit were from Dinsho (47%) and Gofingera (45%) villages, while the least was from Garambadima (15%). Most of the views of local communities on customary benefits were not variable across villages, proximity, settlement duration, and livelihood source, except for cultivation across villages.

Respondents from Zaloabeba, Karare and Gojera villages, which are partly within the park boundary, felt that they get no benefits concerning land for cultivation from the park area, while 11 and 15% of Dinsho and Gofingera residents acknowledged that local communities use land from the park area for cultivation. Dinsho had the highest proportion (32%) of respondents who cited construction material as source of benefit. 83% of the respondents thought that benefits were not fairly and equitably available to the local communities. The same view was held by key-informants that those settlers

Table 4. Perceived conflicts by the local communities.

Types of conflicts	Percentage that responded positively	Across villages (df=6)	Across proximity (df=2)	Settlement duration (df=3)	Livelihood strategy (df=3)
Competition with wild animals	32	X ² =7.604 P=0.269	X ² =2.491 P=0.288	X ² =4.202 P=0.240	X ² =2.708 P=0.439
Disease transmission	38	X ² =28.268 P=0.000*	X ² =3.422 P=0.181	X ² =6.166 P=0.104	X ² =5.639 P=0.131
Predation (depredation)	47	X ² =7.834 P=0.250	X ² =4.580 P=0.101	X ² =2.950 P=0.399	X ² =2.977 P=0.395
Crop damage	71	X ² =8.994 P=0.174	X ² =10.115 P=0.028**	X ² =1.386 P=0.709	X ² =1.273 P=0.736
Resentment due to forceful relocation in the past	84	X ² =31.906 P=0.000*	X ² =12.889 P=0.002**	X ² =1.146 P=0.766	X ² =2.653 P=0.448
Firewood collection restrictions	54	X ² =35.397 P=0.000*	X ² =19.081 P=0.000*	X ² =2.503 P=0.475	X ² =1.389 P=0.708
Construction wood collection restrictions	53	X ² =26.268 P=0.000*	X ² =7.857 P=0.020**	X ² =1.880 P=0.598	X ² =0.374 P=0.946
Restrictions to access roads	39	X ² =20.371 P=0.002*	X ² =9.365 P=0.009**	X ² =0.750 P=0.861	X ² =3.512 P=0.319
Livestock or grazing restrictions	74	X ² =15.645 P=0.016**	X ² =5.236 P=0.073	X ² =1.205 P=0.752	X ² =1.865 P=0.601

*Significant at 0.01 level, **Significant at 0.05 level.

from Dinsho town were more privileged than residents in other villages when it comes to benefits such as employment, leasing horses and serving as tourist guide.

Key informants recommended the benefit types that they thought as direct and would serve common interest of all their members. Their main recommendations were: 1) Free distribution of food grains in times of drought; 2) Financially assist the local communities when they are constructing and restoring religious sites such as mosques; and 3) Subsidies, if possible, provide first-aid drugs free of charge to local communities from existing human and vet clinics.

The most frequent cited source of conflict was fear due to forceful relocation experience in the past (84%) from the park area although grazing restrictions (74%) and crop damage (71%) were also commonly cited by residents experiencing conflicts. Those villages very close to the park have significantly felt fear of relocation as the major source of resentment towards the park, particularly all in Gojera and Horasoba villages. The least cited conflicts were grazing competition between wild animals with the domestic stock (32%) and disease transmission from wild animals to domestic stocks (38%). Villages closer to the park area, as revealed from key informants, frequently cited crop damage and livestock depredation as the main conflicts. Warthog and baboons were the main causes of crop damage. Crop damage also occurred by mountain nyala during the evening, especially when the crops, mainly barley, ripened

(Table 4).

Village types and proximity to the park headquarters appeared to have influenced more the perceptions of local communities towards most conflict encounters than other group variables (Table 4). On average, 70 and 40% of the respondents felt that forest cover had decreased and land covered by agriculture increased over the past 5 to 10 years, respectively. However, a clear majority (66%) did not believe that their livelihood activities were contributing to decrease in forest cover. This view was more common among recent settlers than medium and long-term settlers (Figure 2). Almost all (98%) the respondents agreed that if the park was left open access, the park's resources (forests and wild animals) would be severely affected.

Views about trends of land size covered by crops differed significantly among different villages ($X^2 = 29.061$, $df = 6$, $P < 0.01$) and across proximity ($X^2 = 15.315$, $df = 2$, & $P < 0.01$). The proportion of respondents that felt big game population have increased over the past 5-10 years ranged from 15 (Garambadima-the farthest village) to 74% (in Dinsho town), with the average being 54%. The views were different across villages ($x^2 = 15.182$, $df = 6$, $P < 0.05$) and proximity ($x^2 = 8.186$, $df = 2$, $P < 0.05$). Similarly, views of respondents on changes of land cover (forests) in the past five to ten years were highly different across proximity ($x^2 = 15.315$, $df = 2$, $P < 0.001$).

Awareness of local communities on the relationship

between park protection or conservation and continuous flow of streams and rivers were significantly variable across villages ($\chi^2=13.853$, $df = 6$, $P < 0.05$). The highest number of respondents, who differed on the association of continuous water flow with park protection was recorded from Zaloabeba (57%) followed by Gojera (28%), while the lowest number from Garambadima and Horasoba was 10% each. Garambadima and Horasoba villages have suffered from recurrent drought in recent history more than the other villages. The majority (61%) of the respondents agreed that conservation efforts of the park influenced the amount and quality of water for drinking (both livestock and humans) and irrigation. The highest number (81%) was recorded in Horasoba village while the lowest in Zaloabeba, which is very close to the park. Respondents' perception concerning rainfall, soil productivity and forest cover change were not different. On average, 56 and 61% of the respondents felt that the rainfall and soil productivity decreased in the last five to ten years, respectively.

94% of the respondents felt that BMNP is a heritage site for all Ethiopians and their views were significantly different across villages ($\chi^2 = 16.678$, $df = 6$, $P < 0.05$). All respondents in Dinsho town agreed with the idea that they were beneficiaries of hospitality services to a range of visitors. 79% of the respondents held an inspiration to support the park conservation activities if given the chance. However, almost comparable number (78%) felt that they were alienated or were never consulted on issues that matter to the park development. Views of willingness to support the park were highly significantly different across the villages ($\chi^2 = 48.036$, $df = 6$, $P < 0.001$) and proximity ($\chi^2 = 9.792$, $df = 2$, $P < 0.01$). High proportion (95%) was recorded in Garambadima village agreeing to support while 82% of respondents in Karare disagreed on the idea of supporting the park.

Three quarter (75%) of the respondents across the villages agree with the idea that tourism is good for the regional economy although their views were significantly different across proximity ($\chi^2 = 6.106$, $df = 2$, $P < 0.05$). 83% of respondents from villages relatively closer to the park and 55% from villages far away from the park headquarters agreed with this idea. Positive behavior was observed from the local communities concerning the importance of the park as a centre of recreation.

Nearly three quarter (73%) of the respondents felt that the mountain nyala population size has increased in the past ten years, while 6% stable and 15% have no idea about its trend. Their views were similar across villages, proximity and duration of settlements. The proportion of respondents in livelihood category, felt the increase of the mountain nyala was from small businesses holder (100%), farming/crop cultivation (89%), mixed farming (71%) and livestock rearing (50%). Out of the total respondents, 75% felt that poaching was a common practice, although they did not think it is a threat to the mountain nyala, while 17% considered it as a minor

threat and 8% a major threat. 18% of the respondents have encountered dead mountain nyala in their lifetime, and the highest number was recorded in Karare Village (65%), which was very close to the park headquarters, and the lowest in Horasoba (5%). Most respondents assumed that the cause of death was predator. On average, 60% of respondents encountered live mountain nyala on their farmlands and the encounter rates were highly significantly different across villages ($\chi^2=30.841$, $df = 6$, $P < 0.05$) and proximity ($\chi^2=11.399$, $df = 2$, $P < 0.01$). About 64% of the respondents thought that mountain nyala follow daily regular paths while moving and their knowledge were highly significantly different across villages ($\chi^2 = 37.138$, $df = 6$, $P < 0.001$) and proximity ($\chi^2 = 22.554$, $df = 2$, $P < 0.001$). Clear majority (64%) of the respondents recognize daily pattern of movements of mountain nyala in the area.

The proportion of respondents in favor of having high number of mountain nyala in the area ranged from 81 to 94%. Their views were not statistically different across villages ($\chi^2=3.654$, $df = 6$, $P > 0.05$), proximity ($\chi^2=0.896$, $df = 6$, $P > 0.05$) and duration of settlements ($\chi^2=2.252$, $df = 6$, $P > 0.05$) and livelihood source ($\chi^2=0.901$, $df = 6$, $P > 0.05$). However, group discussion with key informants revealed that numbers of mountain nyala were growing and they were concerned about its impact on their agricultural crops.

Traditional and cultural uses of the mountain nyala products such as horns and hides were rarely practiced in the area with only 2% of the respondents having knowledge of such uses. Their knowledge were significantly different across villages ($\chi^2=55.642$, $df = 6$, $P < 0.05$), with the highest number of respondents in Zaloabeba (10%) and Gofingera (5%); and with no record in other villages. About three quarter (77%) of the respondents had views that livestock has no impact on the mountain nyala although their views were significantly different across the villages at 0.01 level ($\chi^2 = 21.418$, $df = 6$, $P < 0.05$) and proximity ($\chi^2 = 8.049$, $df = 2$, $P > 0.05$). Almost equal proportion (76%) of them felt that there were no common diseases affecting both the mountain nyala and their livestock, although these were significantly different across villages ($\chi^2=13.987$, $df = 6$, $P < 0.05$) and duration of settlements ($\chi^2 = 9.104$, $df = 3$, $P < 0.05$). However, 61% the respondents acknowledged that mountain nyala were seldom observed feeding on areas overgrazed and often frequented by livestock.

DISCUSSION

Local people negative influences on the park and the mountain nyala that include crop cultivation, deforestation, illegal settlement and livestock grazing were common in the study area. Similar finding was reported in other National Park of Ethiopia (Tewodros and Afework, 2014). Land use practices in the area have

changed considerably in the past 40 years. Expansion of agriculture and subsequent loss of forest cover (mainly *Juniperus/Hagenia* woodlands) in the area have been enormous. The contrast of forest cover change was obvious to a casual observer between scattered trees of *Juniperus* and *Hagenia* in some of the villages, for example Gojera farmlands; and the Sanctuary, which was covered relatively by dense trees of these two species (Hillman, 1988). Unlike the early 1970's, when the local people were predominantly pastoral, at present, the majority of households practice settled agriculture as well as keeping livestock. Principal sources of feed for livestock were from communal land, which includes the park area; hence the park's authority was faced with a challenging task to implement the required measures to conserve wildlife of the park vis-à-vis the prevailing high grazing pressure. The land which otherwise was used for grazing was put under cultivation and this has led to a shortage of grazing land. This was especially the case during the wet season when crops mature in the farmers land and the pressure often mounted on 'unused' land from the park area.

The park was not legally gazetted and accordingly with no clear boundary that makes applying law enforcement a difficult task (BMNP, 2007), and hence these uncertainties seemed to have affected the relationship between the park authority and the local communities. Legitimacy are largely based on the degree of accord with a person's values and beliefs, it may also be expected that personal evaluations of benefits and disadvantages associated with a given management system may be linked to views of legitimacy (Stern, 2008). Such rational evaluations may form a strong basis for individuals' perceptions and attitudes toward the protected areas (Fiallo and Jacobson, 1995; Ajzen, 2001). This basic view of legitimacy, which is largely based on acknowledging of protected areas authorities for reasons of self-interest, has been termed 'pragmatic legitimacy' by Suchman (1995).

Perceptions of legitimacy around protected areas, and therefore voluntary compliance, may also be related to local perceptions of the benefits and disadvantages associated with the existence of the protected area (Stern, 2008). Similarly, this study revealed that conservation in the park heavily relied on voluntary compliance of the local community due to their perceived benefits from the park. Similar finding was noted by (Nielsen, 2003) that if the risk is perceived by local community to be too high in relation to the potential benefits of violating protected areas regulations, then compliance is likely to be enhanced. Ways of achieving voluntary compliance with protected areas regulations have been widely debated (Stern, 2008). There have been many argument for more people-oriented approaches, including stronger emphases on environmental education strategies, integrated conservation and development projects (ICDPs) and community-based natural resource

management (CBNRM) (Stern, 2008). Such arguments often advocate the participation and empowerment of local residents in natural resource-based decisions and management processes (Gurung, 1995; Wells and McShane, 2004; Moorman, 2006; Baral et al., 2007). Meanwhile, others have cited failures in such approaches to call for a continued reliance upon more traditional coercive measures, suggesting that relying on voluntary compliance, even in exchange for some benefits, fails to account for people's desires to maximize their take of common resources (Rabinowitz, 1999; Terborgh, 1999.).

The majority of the respondents rear or keep livestock mainly for insurance in time of crop failure. This was a change in attitude of the local communities towards livestock ownership from the widely held attitude in which high numbers of livestock irrespective of quality are mainly kept to signify social status in rural areas than household food security in Ethiopia (Misginaw, 2013). The change in attitude might be influenced by a deteriorating natural environment. For example, the overwhelming majority of Garambadima residents have experienced recurrent droughts in recent years due to poor agricultural practices and insufficient rainfall. They acknowledged that livestock ownership for prestige is something of the past.

Hence, there is good reason for optimism for an intervention related to animal husbandry that focuses on promoting ownership of few quality animals rather than quantity. Nevertheless, the study revealed that the local people still own a lot of animals, which might suggest the need for awareness education that can lead to behavioral change (Tedla, 1995). The local people that were relatively close to the park have higher desire to own more cattle in the future than they have at present. The proximity to grazing lands within the park may partly explain this attitude of having more cattle. The majority of the local communities were dependent on free range grazing as sources of feed for their livestock, and they have also experienced animal feed shortage. The grazing pressure on grassland habitat of the park was undoubtedly clear because virtually no open grazing land was kept aside by the farmer especially during cropping season.

Land use practices in the area have changed considerably in the past 40 years. Expansion of agriculture and subsequent loss of forest cover (mainly *Juniperus/Hagenia* woodlands) in the area have been enormous. The contrast of forest cover change was obvious to a casual observer between scattered trees of *Juniperus* and *Hagenia* in some of the villages, for example Gojera and the Sanctuary, which were used to be covered relatively by dense trees of these two species (Hillman, 1988). Unlike the early 1970's, when the local people were predominantly pastoral, at present, the majority of households practice settled agriculture as well as keeping livestock. Principal sources of feed for livestock were from communal land, which includes the park

park area; hence the park's authority was faced with a challenging task to implement the required measures to conserve wildlife of the park vis-à-vis the prevailing high livestock grazing pressure. The land which otherwise was used for grazing was put under cultivation and this has led to a shortage of grazing land. This was especially the case during wet season when crops mature in the farm land and the pressure often mounted on 'unused' land from the park area.

The study reveals that the local communities did not consider the park, as it stands, as a source of substantial benefit. Denying people benefits and access from natural resources, people opt to develop negative attitudes and engage in activities that are detrimental to conservation (Ebua et al., 2011). However, they acknowledged the eco-tourism potential of the park because the legal benefits they were getting from the park such as horse lease, employment as tour guide are tourism related. Hence, the local people have a strong belief and hope that the future development of tourism sector of the park could bring them sustained benefits. Kruger (2005) highlighted the importance of ecotourism as a means of generating much needed foreign currency, both locally and nationally, while at the same time providing a strong incentive to manage nature's strongholds in a way that would conserve them. Irrespective of the consent of the park's authority, the study revealed that, the local people were able to extract what they call 'their customary right' such as fuel wood and construction materials from the park area in their day-to-day activities. This customary use was not considered as benefit.

Provisions of tangible benefits and alternative sources of livelihoods to the local communities should be considered as the central theme. Previous studies have shown that socioeconomic benefits affect attitudes of local people toward wildlife (Kellert and Berry, 1987; Gadd, 2005; Naughton-Treves and Treves, 2005; Romanach et al., 2007; Morzillo et al., 2010). Part of the revenue generated from the tourism sector should be available for common needs of the local community. A system should be sought on how to share benefits generated from trophy hunting of mountain nyala in nearby controlled hunting area. In addition, some of the revenue should go to the efforts on the conservation of mountain nyala on the site. The hunting affair was owned by private entrepreneurship with no financial input for the park management. To maximize the tangible benefit that the people are getting, allowing low-impact sustainable use of resources from the park area such as bee keeping and collection of dry fuel wood could be an option. Realizations of tangible benefits to local communities living around protected areas in Africa are curtailed by political and economic regimes that are not accommodative of such provisions (Emerton, 2001). The case of BMNP was not different, since all revenue generated at the park level goes to regional or central government, with nothing left for the park authority to augment such

provisions. Equity of benefit distribution that accrued from the park also remained a problem and the overwhelming majority of respondents in this study clearly indicated that benefit access to the park's resources was unfair and unbalanced. Such unfairness must change since some authors like Robinson (2006) argue that conservation of wildlife can only be achieved through proper resource management and by establishing effective governance by allocating resources fairly and equitably.

The utilization of certain resources within a protected area on a sustainable basis could decrease conflicts and nurture positive attitudes of the local people towards wildlife conservation and ultimately encourage them to reduce poaching, timber felling and other consumptive land uses (De Boer and Baquete, 1998; Kruger, 2005). The local people will start to appreciate the significance of the protected area if income from tourism and employment would be made available to them (Nepal, 2002). Studies showed that the attitudes of people towards protected areas are positively influenced by the benefits, which they acquire from the protected areas (Lewis et al., 1990; Saberwal et al., 1994; Fiallo and Jacobson, 1995; Studsrod and Wegge, 1995; Emerton, 2001; Kruger, 2005; Allendorf, 2007). However, if benefits are perceived as small in relation to losses or inequitably distributed, they may not achieve the required positive effect (Homewood et al., 1997). Unfortunately, realization of tangible benefit to the local communities living around protected areas in Africa is curtailed by political will and economic regimes that were not accommodative of such provisions (Emerton, 2001). The case of BMNP was not different.

With regard to conflict, 40 years ago, the memory of infamous relocation, carried out by the then regime, of the people living in Gojera village appeared to be fresh and alive in the minds of the local people. Most residents still fear that one day they will be displaced. Relocation with very limited consultation with the people, has negatively affected the relationship of the park authority with the local people.

Relocation of the local community should not be forceful, as it had been done in the past, which could be counterproductive and would aggravate the existing conflict between the park authority and the local communities. Reducing conflicts between wildlife and people is likely to reduce the negative attitude that many communities have towards wildlife and conservation (Emerton, 2001; Muruthi, 2005; Kideghesho et al., 2007). Relocation should be based on consent of the local communities. Rigorous conservation awareness education and communication coupled with compensation schemes are mandatory before attempting any relocation activities of the local communities from the park area.

The traditional knowledge of the local people concerning change in their surrounding environment such as forest cover, soil and wild animals were enormous. The

majority of them felt that rainfall and soil productivity have decreased in the last five to ten years. However, there seemed to be a gap in awareness on some ecological issues. The majority of these people predominantly from recent settlers did not associate their livelihood activities with dwindling forest cover and also most believe that big game animals were increasing in the park. This could indicate that there would be a need for targeted and concerted environmental awareness education in order to achieve positive change in the perception of the local people. Particular emphasis on awareness education should be given to recent and short-term settlers within the park. The existing awareness education, which was mainly undertaken by the Ethiopian Wolf Conservation Project, was narrow in scope targeting only on the conservation of the Ethiopian Wolf (*Canis simensis*). The park authority should apply such awareness education to target wider issues of wildlife conservation in the Park. Most of the local people were positive to support the conservation activities in the park if they are given the chance, even though they were alienated or never consulted before on issues of the park management and matters that would ultimately affect them. Moreover, the overwhelming majority of the respondents have supported the idea of BMNP as a national heritage for all Ethiopians, which is probably a good indicator of how the local people perceive the importance of the park beyond their immediate use.

The knowledge of the local people about the mountain nyala was diverse. Most were not antagonistic towards having mountain nyala in their vicinity, even though some were concerned about their impact on agricultural crops. Wildlife crop damage was often the major cause of human-wildlife conflict, particularly in situations where the site of farming community border protected areas (Gillingham and Lee, 2003). Malcolm and Evangelista (2002) have noted that mountain nyala are peaceful and do not appear to infringe directly on the lives of many people; and therefore, the antelope is not seen as a competitor. Group discussions revealed that the existence of mountain nyala was tied up to their existence and livestock as well. Surprisingly, some argued that mountain nyala are attracted to the smoke and household rubbish coming out of their house and accordingly they thought that if they are displaced, the same would happen to the animals. Part of their assertion was because mountain nyala often spend the night roaming around the farmers' field. However, the cause of the movement was not related to loving of smoke or people but presumably for search of habitat requirement from the area that were taken by the local communities. The local communities were also concerned about the apparent high population number of mountain nyala. Particularly, they were concerned about crop damage and disease transmission to their livestock. As a measure against these, some suggested culling the mountain nyala population and if possible fencing out the area. Traditional

hunting of wild animals for their skins, horns and meat were practiced to a limited extent (Hillman, 1986b).

Conclusions and recommendations

Proximity of settlements to the park and types of villages appeared to have influenced perceptions held by the local people more than the duration of settlements and livelihood sources. The views on perceived benefits and conflicts, forest cover change and ecological variables and local knowledge about the mountain nyala to some extent were diverse across the livelihood source. The overall attitude of the local people towards the park and the mountain nyala conservation seemed positive. However, having positive attitude does not guarantee positive behavior because majority of the local people carry out unchecked exploitation of the park's natural resources.

The results were indicative of the attitudes of the local people. Awareness education to bring positive required behavioural changes among the local communities would be indispensable. Arguably, even if the local communities were allowed to have free access to the park by abolishing restrictions, the sustainability of their livelihood could not be guaranteed in the longer term Hurni and Ludi, (2000).

Settlement and its associated problems could remain as formidable challenge facing the park authority. Re-demarcation of the park boundary is paramount. Particularly, relocation of settlements out of Gojera village should be carried out as a matter of urgency. Resettling the remaining bordering villages like Karare, Horasoba and Zaloabeba at least at 5 km radius away from the park border should also be considered if conservation of the mountain nyala is anticipated. Establishment of a liaison committee including representative from the park staff, local communities and Dinsho town that would serve as a link between the park authority and the local people is paramount. Such committee would oversee issues like natural resources use including benefit sharing, control or regulation of settlements and immigration, control of illegal use of the park's resources and would also assist law enforcement concerning wildlife.

Conflict of interest

The author has not declared any conflict of interest.

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