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RESEARCH ARTICLE

TROPHY HUNTING AND HUMAN-WILDLIFE INDUCED CONSERVATION THREATS TO WILDLIFE OF HANTO CONTROLLED HUNTING AREA, SOUTHEASTERN ETHIOPIA

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ABSTRACT

Investigation on human-wildlife induced conservation threats to wildlife of Hanto controlled hunting area was carried out between 2016 and 2017. The objective of investigation was to identify the role of trophy hunting and human-wildlife induced conservation threats to wildlife of Hanto. To achieve the objective, questionnaire survey, focus group discussion and wildlife habitat survey techniques were employed to assess conservation threats of wildlife in the study sites. A sample of 172 individual households were randomly selected for questionnaire survey from Hora-Soba, Galama-Hebano and Amalama-Chofera villages, Which were selected purposefully based on their distance from the study sites. Further 8-10 individuals were selected from village elders controlled hunting area scouts and village leaders in each of the three villages for focus group discussions. The major identified sources of conservation threats to wildlife in the study area were: highly dependence of the local community on the resource of the controlled hunting area (82.8%) which was exacerbating the loss, degradation and fragmentation of wildlife habitats, wildlife induced damage on livestock and crop, and negative attitudes (56.1%) of local people towards wildlife conservation are. Hence, practical participatory conservation measure with appropriate management plan is needed to solve the problems and safeguard the endemic and other wildlife in the controlled hunting area.

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INTRODUCTION

Ethiopia is one of African countries which is located at 3˚30'N and 15˚00'N latitude and 33˚E and 48˚E longitudes in the horn of Africa, and home for highly diversified fauna species (Shimelis and Afework, 2008). The country has a land area of 1.12 million square kilometers and a wide variety of topography and climate (Jacobs and Schloeder, 2001). Currently it has more than 284 species of animals of which 31 are endemic (Yalden *et al.,* 1996; Afework and Corti, 1997; Leykun, 2000). However, the negative interaction between people and wildlife has currently become fundamental aspects of wildlife management and complex challenge being faced by all conservationists everywhere. It arises mainly because of the loss, degradation and fragmentation of habitats through human activities such as, logging, animal husbandry, agricultural expansion and developmental projects (Fernando *et al.,* 2005; Yosef and Afework., 2011). As habitat gets fragmented, it leads to greater contact and conflict with humans as wild animals seek to fulfill their nutritional, ecological and behavioral needs (Sukumar, 1990).

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Particularly in Africa, as human populations and demands for natural resources increase throughout the continent, the conflict will continue to increase (Browne and Jonker, 2008). It is a serious obstacle to wildlife conservation worldwide and is becoming more prevalent as human populations increase, development expands, the global climate changes and other human and environmental factors put people and wildlife in greater direct competition for a shrinking resource base (Demeke and Afework, 2013a, b). Human livelihoods can be severely affected by such depredation and generating negative attitudes towards wild animal conservation (Woodroffe and Ginsberg, 1998; Hussain, 2003). In addition, with increasing human population and encroachment into areas bordering wildlife reserves, there is an increasing risk of disease spreading domestic animals to the wild animals (Bourn and Blench, 1999). Despite, Ethiopia is among few African countries with high mammal species diversity, its mammalian resource is significantly degrading (Zerihun *et al.,* 2012). According to, EWCA (2012) reports in Ethiopia, there are 20 National Parks, 3 Sanctuaries, 2 Wildlife reserves, 17 Controlled hunting areas, 3 Community conservation areas, 7 Open hunting areas and 58 Forest priority areas exist but this number increasing from time to time. Despite, different efforts were made by the government in the country for wildlife

conservation, human activities like; habitat loss and fragmentation, land clearance for farming, overgrazing and illegal encroachments to the conservation areas are the most series problem of the 21st century for every nation (IBC, 2007; Tadesse, 2007). Hence, the current study site, Hanto controlled hunting area (HantoCHA) is part of Bale Mountain highlands that encompass Africa's largest alpine plateau and contain the largest populations of Africa's most charismatic species. It is one of the recently established protected areas in Ethiopia. Today, the area is leased to a local investor known as 'Rocky Valley Hunting Safari Privet Limited Company'. The CHA supports a number of wildlife species including endemic mountain nyala and Menelik's bushbuck. It is found in between Dinsho, Agarfa and Adaba districts in the North-West direction of Bale Mountains National Park (BMNP). As per the knowledge of investigator, there was no scientific information on underlying human-wildlife induced conservation threats to wildlife in the study site. Thus, the present study is aimed at contributing to fill the existing gap though investigating the prevailing human-wildlife induced threatening factors to wildlife conservation. Therefore, hope the information compiled here will help to improve wildlife management decisions, facilitate scientific research, and supplement conservation strategies of wildlife of the study site.

MATERIALS AND METHODS

The Study Area: The current study site is known as Hanto controlled hunting area (Hanto CHA). It is located in the southeastern part of Ethiopia, in the Oromia administrative region of Bale Zone, Dinsho district. Hanto CHA is 378 km from Addis Ababa. The area is established in 1998, and leased to a local hunting concession. Therefore, currently the local investor known as Rocky valley hunting safari P.L.C, hold the rights for hunting throughout the area (OFWE, 2013). The study site is located within geographic coordinates of 7°04'– 7°20' N latitude and 39°34'– 39°50' E longitude along the Southeastern highlands of Ethiopia at about 7 km North-West direction from the border of Bale Mountain National Park (Figure 1). It encompasses an area of 190 km^2 and characterized by a chain of mountains and sub-alpine forest ecosystem. The topography of the study area is dominated by high and rugged mountainous ridges with high slopes and gently rolling steep hills with all of the areas elevation ranging from 2,980 - 3,585 m asl. It is also characterized by sub-afrolapine and upper montane ecosystem vegetation type which are dominated by *Hageniaabyssincia*, *Hypericumrevolutum*, *Juniperusprocera, Sinarundinariaalpina* and *Erica* vegetation. The mean annual temperature of the area is 10.9°c while the mean lowest and highest temperatures are 4.7°c and 17.1°c respectively. March is the hottest month (18.75°c) and December is the coldest (2.01°c) months. The area has a bimodal local climate with two wet seasons that have heavy and small rains. The data obtained from National Meteorological Agency of Bale branch directorate shows the area were having the mean annual rainfall of up to 1120 mm for the past ten years (2004-2014). The heavy rains occur from July to October, with the highest peak in August and the small rains from March to June, with a peak in April (NMABD, 2015).

Methods

Sampling Design: The present study was carried out by means of a questionnaire and focus group discussion. In order to collect basic information about the location, climatic condition, topography, habitat types and approximate size of the study area a preliminary survey was carried out in the first two week of February 2016in the CHA. Habitat types, landscape of the study area, surrounding villages between 0 to5km distance from the CHA and wildlife distribution were identified. Data on conservation threats to wildlife in the controlled hunting area were collected using semi structured questionnaire survey and focus group discussion from the sample households of the Hora-Soba village (Dinsho district), Galama-Hebano (Agarfa district) and Amalama-Chofera (Adaba district), Which were selected purposefully (Table 1). These villages have distance of less than 5km from the CHA and have high contact with the area. A sample of 172 individuals of the households were selected randomly as used by Kangwana (1993), Maddox, (2003) and Tewodros and Afework, (2008).Prior to formal data collection, pilot test for questioners were carried out on some individuals that are not included in the sample and little modification were made on the questionnaire. Similarly, as indicated by Kleiber (2004), focus group discussion is a useful device to have insights on perceptions, opinions and attitudes of research subjects on research problem under investigation. Therefore, for the current investigation 8-10 individuals were selected from village elders, controlled hunting area scouts and village leaders in each of the three villages. Focus group discussion participants were selected purposively based on criterion of having better information about the CHA(Tewodros and Afework, 2008). The discussions were conducted at each village separately ina local language Afan Oromo and used as a complement for questionnaire survey.

Data Collection Methods

Following similar techniques of Tewodros and Afework (2008), and Demeke and Afework (2013b)questionnaire data was collected for the assessment of the impacts of human and wildlife related activities in the study area. A semi structured questionnaires were designed and conducted to households of the local people that selected from Hora-Soba, Galama-Hebano and Amalama-Chofera villages to get the necessary information about conservation threats. The questions were addressed to household heads within their area of farming and residence (Hill, 2000). The questionnaire was administered in a random manner based on first come first serve basis (Newmark *et al.,* 1994), and alternating male and female respondents as much as possible. The questions were emphasis on collecting data's on conservation challenges of wildlife and their habitats (such as: deforestation, human and livestock encroachment, fire, farm expansion, damage caused to crops and livestock by wild animals, attitudes of local communities towards wildlife and the control hunting area management and benefits of local communities from controlled hunting area. In addition to questionnaire survey, focus group discussions were used as a support for the semi-structured questionnaire interview. Three focus group discussions (8-10 individuals for each village) were held with local peoples. To get further information from the focus group discussion five open-ended questions were pre-designed and used. The questions were emphasized on collecting information on how local peoples and their livestock affect wildlife? How local peoples and wildlife co-exist? And measures to be taken to maximize the benefit of local communities while sustainably managing wildlife? Information obtained from group discussions were summarized using text analysis method, and reported as narrative form as noted by Tewodros and Afework (2008).

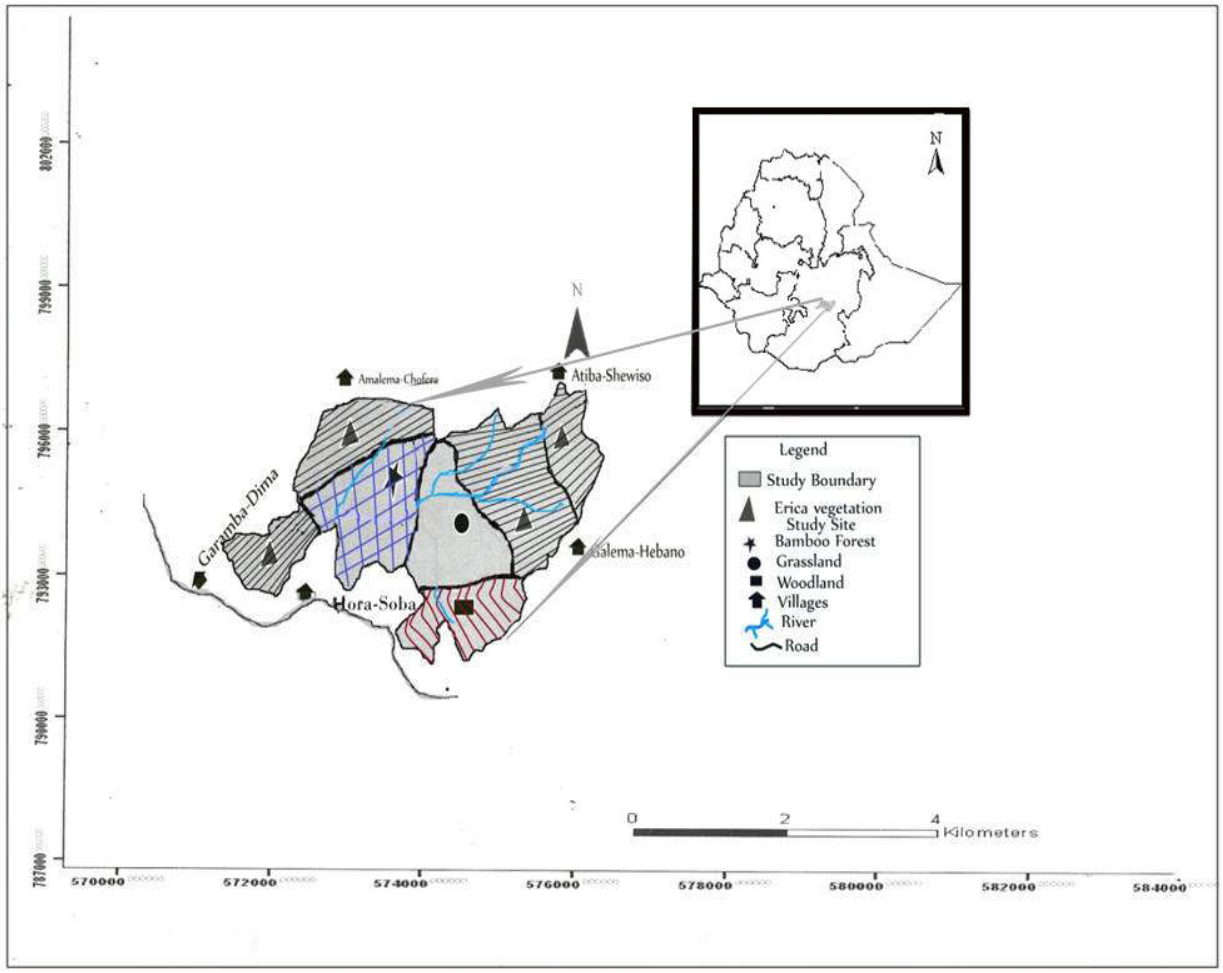

Figure 1. Map of study area with location of study sites

Data Analysis: For data analysis SPSS computer software version 20 and descriptive statistics (mean, frequency, and percentage) were used. Further, Chi-square tests at were used at 95% confidence interval and 0.05 levels of significance to compare significance differences between village's attitude on conservation of the CHA, education level and attitude of the local people towards conservation of wildlife, households' livelihood activities, loss of livestock at each village, damage on crop, benefits from controlled hunting area, resource use from the CHA, and other parameters.

RESULTS

Demographic Information

Age of Respondents: Totally, 172 respondents were interviewed during this study (Table 2). Majorities (77%) of the respondents were males and 23% were females (Table 1). Ages of the respondents were ranges from 25 years to 75 years. However, 75% of the respondents' ages were greater than 31 years.

Education Background: Out of total number of respondents, 62.8% were illiterate, 11 % had adult education, 23.3% elementary education and only 2.9% had secondary education. Education level and attitudes of the local people are given in Table 3.56.1% of the respondents had a negative attitude towards conservation of the controlled hunting area and43.9% of the respondents have positive attitudes towards conservation of the CHA. Those educated groups were showed more positive attitude for conservation of the CHA than illiterate groups. The difference in attitude of the respondents on educational level were statistically significant (χ^2= 13.2, df = 2, P< 0.05).

Livelihood Activity: On average, about 91% of the households' livelihood activities were dependent on both crop production and livestock keeping (Table 4). There was no significant difference in livelihood activity among the villages (χ^2 = 0.33, df = 2, p > 0.05). The distances of the villages vary from zero to five kilometers from the CHA. However, Hora-Soba village is more close to the CHA than other villages and Galama-Hebano is far from the CHA.

Land holding per household: There was no significant difference (χ^2 =1.56, df=2, P> 0.05) in the size of land holding between the study sites. In the CHA 42.3% of the respondents have a land size of 0- 1.5 ha and 21.7%have greater than 3.1 ha. But in Galama-Hebano 48% of the households have a maximum of 1.5 ha (Figure 2).

Wildlife Induced Conservation Threats

Loss of Livestock: In this study, local peoples identified four most common prey species of domestic animals such as sheep, goat, cattle, horse and donkey. The predator species were: Spotted hyena, Leopard, Anubis Baboon and Common Jackal (Table 5).

They are perceived as severe problem posing predators on livestock's in the area. The opinion of respondents on the extent of carnivore threats on livestock were statistically significant (χ^2= 26.9, df = 3, P< 0.05). Most respondents indicated that, spotted hyena and leopard were the most threat posing predators. It is indicated that, the numbers of domestic animals attacked for the last 3 years were increasing (Table 6).The number of domestic animals killed in Hora-Soba is the highest (381), while Galama-Hebano is the lowest. There were statistically a significant difference among villages in the total number of domestic animals killed (χ^2 =412.38, df = 2, P < 0.05). A total of 635 domestic animals, were killed by predators in the past 3 years.

Crops Damage

The local peoples described, Barley, bean, maize, potato and vegetables were the widely cultivated crops in the area. The report showed that all these crops are preferred by most of crop riding wild animals species such as Mountain nyala, Menelik's bushbuck, Common warthog, Bushpig, Bohoor Reedbuck, Grey duiker, Porcupine, Vervet monkey, and Anubis baboon. Among the respondents, 48.5% noted, these animals caused very much problem, while 16.5% noted that the animals caused no damage (Table 7).

Opinion on Trends of Wildlife Population: Most of the respondents (77.4%) were noted that, *wildlife population* in the CHA have *been increasing* whereas, 4.3% indicated *that wildlife* population were not changed from previous situation and 16.7% of respondents did not know. But 1.5% indicated that their number decreased (Table 8).However, the opinion of respondents on the *abundance of* wild *animals has* no significant difference (χ^2= 4.2, df = 2, P > 0.05) around the controlled hunting area.

Human Induced Conservation Threats: The resources used by local community from the CHA were given in Table 9. 82.8% of the respondents noted that, the local communities are highly dependent on the resources of the controlled hunting area. Of 172 respondents, 70.2% used the area for livestock grazing, 59.0% were cutting trees for construction, and about 27.8% use the CHA for farming and 70.6% use for fuel wood collection. Only 17.2% of the households are not dependent on the CHA.

Impacts due to Livestock Encroachment: On average each household has about 35 livestock (16cattle, 10sheep, 4goat, 1 donkey and 4horses) (Table 10). The questionnaire survey identified 70.2% of the local community were dependent on the CHA for grazing. Hence, the observed large number of domestic animals might result overgrazing and increased competition with wildlife for resources. The length/duration of livestock grazing in the CHA is given in Table 11.The respondents were showed that the controlled hunting area occupied large area where the local communities used for livestock grazing. Out of the total respondents on average, 45.5% of the communities were grazing their livestock for almost 10-12 months within a year, only 5.2% of the respondents grazing for 1-3 months. The duration of livestock grazing among three local communities around the CHA was statistically significant (χ^2 = 9.4, df= 2, P<0.05).

Benefit Sharing from Trophy Hunting and Attitudes for Conservation: Benefits obtained from the controlled hunting area were given in Table 12. The local communities were expecting different infrastructures, social service, job opportunities and free utilization of all types of resources from the CHA. Yet, most of them were not put into practical, except free gazing and fuel wood collection. From respondents, 55.5% believe that they did not receive any benefit from the existence of the controlled hunting area. However, 44.5% noted that they have received some benefits from the protected area. There was a difference on benefit sharing among respondents of the study sites. In Hora-soba 63.9% received some benefit but only 34.1% in Galama-Hebano. On the other hand, 56.1% of the respondents opposed the existing wildlife conservation activities, while 43.9% have positive attitude about its conservation. There was no significant difference on the attitude of the respondents towards the conservation of CHA (χ^2 =3.3, df= 2, P > 0.05).

Focus Group Discussion: The focus group discussions presented here summarizes the views and interests of discussants in each of the study area. The discussion results showed that majority of the communities have negative attitude towards the existence of the CHA. However, some participants support the existence of the CHA and they need to see wildlife and their habitats well protected. These some discussants recognized the presence of endemic mammalian species in the CHA despite the fact that, communities had not received direct benefits from the trophy hunting. In addition, these discussants were listed certain benefit of the CHA such as: the role of forests in retention and percolation of rain water, soil erosion prevention and climate stability. Further, these group stated ecological and economic role of wild animals, especially the presence of endemic mammal species (Mountain Nyala and Menelik's bushbuck) and its contribution to the national and regional economy through tourism and trophy hunting activities.

Discussants from Hora-Soba villages additionally stated that even though it is not satisfactory, they have received some benefits from the CHA management. These benefits are 30,000 Ethiopian birr for road construction, one animal health post was built, about 45 quintals of basic seed were distributed for farmers, office was constructed for the village, some people rent their horses for trophy hunters and four people were employed in the CHA for scouts from their village. Due to these facts respondents from Hora-Soba villages have relatively positive attitudes towards the conservation of the CHA than other villages who do not received such benefits. Most of the focus group discussion participants described that before the establishment of the CHA, they were used to cut trees and bamboos freely, and hunt different wild animals including mountain nyala and Menelik's bushbuck. But now we are prevented not to use freely the animals and cut trees and bamboos for different economic purposes they said. They also indicated that, populations of wildlife were increasing; as a result the negative effects of wildlife (Threat to human and damage to crop and livestock) are increasing from time to time. Hence, most discussants were dissatisfied with the existence of the controlled hunting area. They considered the controlled hunting area as a limiting factor in improving their livelihood. As a result, theyare considering the controlled hunting area as if it has no use for the local community. Moreover, the discussants blame the absence of benefit sharing from trophy hunting fees and absence of compensation for the damage caused by wildlife.

Table 1. Total household and sample size of the study sites

Study villages	Total household number			Sampled households		
	Male	Female	Total	Male	Female	Total
Hora-Soba	764	67	831	70	13	83
Galama-Hebano	337	73	410	26	15	41
Amalem-Chofera	432	47	479	37	11	48
Total	1533	187	1720	133	39	172

(Source: Hora-Soba,Galama-Hebano and Amalem-Chofera Village Administration, 2015)

Table 2. Age category of the respondents

Age category	Age of respondentsin each village			
	Hora-Soba	Galama-Hebano	Amalama-Chofera	Total
18-30	23	9	11	43
31-45	32	17	16	65
≥ 46	28	15	21	64
Total	83	41	48	172

Table 3. Education level and attitude of people towards conservation of wildlife

Level of education	N	Percentage	Attitude of people towards wildlife	
			Positive (%)	Negative (%)
Illiterate	108	62.8	21.5	41.3
Elementary education	40	23.3	13.4	9.9
Secondary education	5	2.9	2.3	0.6
Adult education	19	11.0	6.4	4.6
Total	172	100	43.9	56.1

Table 4. Livelihood activities of the households

Study Villages	N	Distance	Livelihood activities (%)		
		from CHA in km	Crop production only	Livestock keeping only	Both
Hora-Soba	83	0-2	3.6	1.2	95.2
Galama-Hebano	41	2-5	7.3	2.4	90.2
Amalama-Chofera	48	0-5	8.3	4.2	87.5
Mean/Total	172	0-5	6.4	2.6	91.0

Table 5. The extent of carnivore threats on livestock (N=172)

Common name	Species name	Extent of the problem (%)		
		Major threat	Minor threat	No
Leopard	*Pantherapardus*	84.3	14.0	1.7
Spotted hyena	*Crocutacrocuta*	89.0	11.0	0.0
Common Jackals	*Canismesomelas*	43.0	50.0	7.0
Anubis baboon	*Papioanubis*	46.0	48.8	5.2
Total/average	4	65.6	31.0	3.4

Table 6. The number of domestic animals killed in the last 3 years

Study villages	N	Types of livestock's killed					
		Sheep	Goat	Cattle	Donkey	Horse	Total
Hora-soba	83	117	67	111	42	44	381
Galama-Hebano	41	28	19	26	13	11	97
Amalama-Chofira	48	61	22	42	9	23	157
Total	172	206	108	179	64	78	635

Table 7. Major crop raiding wildlife identified in the CHA (N= 172)

Common name	Species	Extent of the problem (%)		
		Major	Minor	No
Mountain Nyala	*Tragelphusbuxtoni*	70.9	23.8	5.3
Common warthog	*Phacochoerusafricanus*	85.5	12.8	1.7
Menelik's Bushbuck	*TragelphusscriptusMeneliki*	62.8	22.7	14.5
Bush pig	Potamochoeruslarvatus	43.0	30.8	26.2
Grey duiker	*Sylvicapragrimmia*	16.9	41.3	41.8
Bohoor Reedbuck	*Reduncaredunca*	29.1	61.0	9.9
Vervet monkey	*Chlorocebuspygerythrus*	23.8	45.9	30.3
Anubis baboon	*Papioanubis*	66.9	25.6	7.5
Porcupine	*Hystrixcristata*	37.8	51.2	11.0
Total/average	9	48.5	35.0	16.5

Table 8. Respondent's opinion on the trend of wildlife population

Study Villages	N	Trends of animal population (%)			
		Increase	Decrease	No change	Don't know
Hora-Soba	83	85.5	0.0	3.6	10.8
Galama-Hebano	41	63.4	2.4	7.3	26.9
Amalama-Chofera	48	83.3	2.1	2.1	12.5
Mean		77.4%	1.5%	4.3%	16.7%

Table 9. Types of resources used from the CHA

Study villages	N	Resource type and use in%				
		Farm land	Grazing	Fuel wood	Construction	Never use
Hora-Soba	83	33.7	85.5	80.7	60.6	10.8
Galama-Hebano	41	26.8	58.5	56.1	56.1	22.0
Amalama-Chofira	48	22.9	66.7	75.0	60.4	18.8
Total	172	27.8	70.2	70.6	59.0	17.2

Table 10. Number of livestock's in each of the study sites in 2016

Study Villages	Types of livestock					
	Cattle	Sheep	Goat	Donkey	Horse	Total
Hora-Soba	16639	6891	2943	761	3324	30558
Galama-Hebano	5171	4720	2342	1043	993	14269
Amalama-Chofera	5262	5748	1437	191	1916	14554
Total	27072	17359	6722	1995	6233	59381

(Source: Hora-Soba,Galama-Hebano andAmalama-Chofera Villages Administration, 2016)

Table 11. Livestock grazing duration in the CHA

Study Villages	N	Length of grazing time				
		Never use	1-3 month	4-6 month	7-9 month	10-12 month
Hora-Soba	83	14.5	2.4	9.6	10.8	62.7
Galama-Hebano	41	41.5	4.9	9.7	9.8	34.1
Amalama-Chofera	48	33.3	8.3	6.3	12.5	39.6
Total	172	29.8	5.2	8.5	11.0	45.5

Table 12. Benefits from controlled hunting area other than grazing and firewood collection

Study Villages	N	Benefit of local peoples from the CHA (%)		Attitude of People	
		Some benefit	No benefit	Positive Attitude	Negative Attitude
Hora-Soba	83	63.9	36.1	53.0	47.0
Galama-Hebano	41	34.1	65.9	39.0	61.0
Amalama-Chofera	48	35.4	64.6	39.6	60.4
Total/average	172	44.5	55.5	43.9	56.1

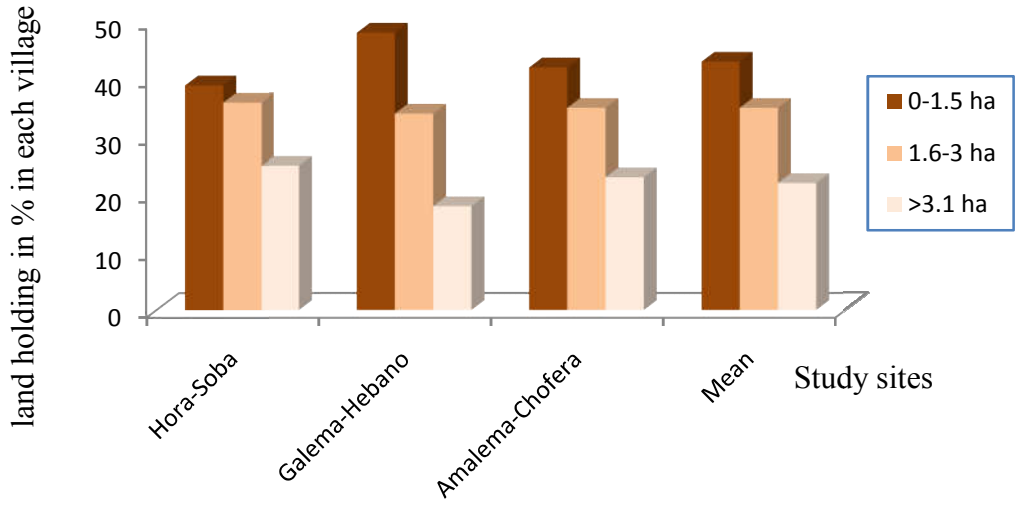

Figure 2. Land holding per house hold

Figure 3. Human and livestock encroachments in to wildlife habitats in Hanto

They also believe that, the CHA had conserved large area beyond its need. Due to this fact, they feel that small area is enough for the existing wildlife and some part of conservation area should be given for them for settlements, and agriculture. They also feel that the CHA management should allow them to use resources like, free access to bamboo and other forest products for different economic purposes without restriction like that of free access to grazing and firewood collection. They also stressed that governments should give them compensation for wildlife induced damage to their crops and livestock.

DISCUSSION

The assessment of human-wildlife induced conservation threats to wildlife in the study area required information from the most responsible and informed members of the households. Therefore, the samples of the study for questionnaire survey consisted adult age class (age > 31 years) accounting 75% of the total respondents (Table 2).Such age class was important in identifying the detailed information of conservation threats (Maddox, 2003; Tewodros and Afework, 2008). The increasing demand for land and the increasing livestock population around the study area have putmore pressure on the semi-protected CHA area. FAO(2009) also identified related problems that associated with human and livestock population increase in different protected areas in Africa. Feyera and Demel (2003) also indicated that the protected areas have been hardly managed in Ethiopia due to increasing human population pressure coupled with poor management. A questionnaire survey identified the average family size of each respondent were 10 person. This is likely to increase the abundance in the area. Literatures also shows in Bale Mountains rapid loss of critical habitat due to increasing human land-use activities is a significant and immediate threat to wildlife in the area (Stephens *et al.,* 2001; Evangelista *et al.,* 2007; Frankfurt Zoological Society, 2007). The local people were agro-pastoralists and their household economy depended exclusively on agricultural and livestock production. Consequently, all the respondents were dependent on land to generate their income that made the competition with wildlife more direct and intense. All members of the villages consider the CHA as their communal pasture area. According to the respondents, the productivity of the land for the majority of farmers is less than sufficient and has no guaranteed source of income to supplement their livelihood. Besides, such lower income groups around the CHA; there was no appropriate benefit sharing from the CHA. Similar study of Hemson *et al.* (2009) in Botswana and Tewodros and Afework (2008) in Senkele Sway's Hartebeest Sanctuary also indicated that, in the absence of alternative sources of income, the local people are more likely to resist rules and regulations, and continue to encroach in the wildlife habitat and exploit resources from the protected area. Consequences of human-wildlife conflict for resource can be both direct, including injury and death with dangerous animals, and indirect, including loss of crops and livestock. Human-wildlife conflict, which is one of the major conservation threats in the CHA become more frequent and severe over the past three years. As a result of, livestock and human population increase, expansion of agricultural activities, human and livestock encroachment on previously uninhabited areas are increasing. Carnivore induced damage is one source of conservation threats in the CHA.

The respondents indicated as the number of wildlife increases around the CHA, threats to human and livestock have been increasing. As a result most respondents have a desire of the number of carnivore wildlife to decline and they dislike the species. Marker *et al*. (2003) and Demeke and Afework (2013a) also stated similar problems especially with large carnivores. However, even if carnivores cause a problem on livestock and human welfare, they also perform a vital role in balancing ecosystem and controlling pest wildlife on crops. The most common predators of livestock in the study area were includes Spotted hyena, Leopard, Anubis Baboon and Common Jackal. Village distance from the CHA and damage caused by wildlife were negatively correlated. As distance from the CHA boundary increased, predation on livestock decreased. Due to this fact more attack on livestock was observed in Hora-Soba village, which is very close to the CHA and less in Galama-Hebano. Similar findings were observed in Tsavo ranches in Kenya by Patterson *et al*. (2004), Serengeti National Park, Tanzania by Holmern *et al*. (2007) and Chebera Churchura National park, by Demeke and Afework (2013a). The exact reasons why carnivores prey on domestic animals are not well understood by the current investigation. However, in some areas, it is thought that livestock are easy prey

(Maddox, 2003). Most respondents in the CHA mentioned that predation was high during calving period. As described by Michalski *et al. (*2006) this might be as calves are easier to attack than adult cattle because of limited escape abilities. Therefore, carnivore attach on domestic livestock enforces people to develop negative attitudes towards wildlife conservation. Crop damage by wild animals is also identified as the other source of wildlife induced conservation threats to wildlife of the CHA. The damage influences staple food grain like barley and non-grain food crop like potato that are commonly planted for subsistence food in the area. Respondents indicated that damages resulted not only from the animals feeding on crop, but also from trampling, footing and other forms of wastage. The most plausible reason for the loss of crops in the area might be due to the presence of farming land in and close to the border of the CHA. A similar finding was observed by Michalski *et al*. (2006) in Amazonian forest landscape. The questionnaire survey also showed farmers residing close to the CHA were severely attacked by crop damaging wildlife. During the study 83.5 % of crop damage occurred mainly within 0-5 km radius from the CHA. Studies by Tewodros and Afework (2008) in Senkele Swayne's Hartebeest Sanctuary also showed that those people closest to protected area boundaries faced more crop damage than far distance people's from the protected area. Similarly, Demeke and Afework (2013b) also indicated that more than 80% of the respondents around Chebera Churchura National Park described damage to crops by wild animals as the most serious problem in the area. Damage to crop was season dependent and commonly occurred in the crop growing season when the wildlife disperses from the protected area into the neighboring community land. Similar finding was observed by Demeke and Afework (2011, 2013b) in Chebera Churchura National Park. Mountain nyala and Menelik's bushbuck damage crops mainly at its young stage. However, other wild animals like warthog and baboon continue to damage until the crop is harvested. Different studies show that ungulates have a positive selection of plant species (Tewodros and Afework, 2008). This holds true in the case of mountain nyala and Menelik's bushbuck that eat crops mainly at its young stage. Except for those of primate, the pest wildlife damages crop mostly during night time when guarding is difficult due to different factors. Local communities used various methods to keep their livestock against predators and crops against herbivore wildlife. Some of the methods used are; using physical barriers; guarding, using domestic dogs and fear-provoking stimuli around the farmland and livestock. These methods are similarly applied around other protected areas across the world.

Michalski *et al*. (2006) described human encroachment in to wildlife habitat for resource sharing causes human-wildlife conflict which is a major threat to wildlife conservation. This concept holds true for Hanto CHA. Because in the study area it was observed that, 82.8% of local people were dependent on the resource of CHA that putts high pressure on the CHA and exacerbate human wildlife conflicts. The dependency of majority of local people on the resources of the CHA might affect wildlife habitat range in addition to wildlife management and conservation activities in Hanto CHA. Study by Demeke and Afework (2011) in Nechisar National Park was also identified similar conservation problems. This study noted 70.6% of the local communities exploiting fire wood from the CHA for source of energy and income generation. This might be due to the absence of source of alternative energy in majority of rural Ethiopia other than fuel wood. Especially, those who live closer to the controlled hunting area collected firewood more frequently than those who are live far from the controlled hunting area. Prins and Grootenhuis (2000) described that, changes in land use, farming, and inadequate wildlife control will aggravate conservation threats of wildlife. In Hanto CHA, among human induced impacts: habitat degradation as a result of uncontrolled settlement, overgrazing, agricultural land expansion, tree and bamboo cutting to generate income, low participation of community on conservation activities, setting fire to the CHA for search of better grass, poor attention of owner P.L.C (only 4 scouts employed with 400.00 Ethiopian birr per month) and the use of domestic dogs as a guard of livestock and crop from wildlife damage were identified as the major threats to wildlife conservation in the study area. During investigation respondents stressed that domestic dogs have been frequently killing the young (juvenile) of wildlife in the CHA. In the present study, large numbers of livestock dominating the wildlife habitats were observed during field survey (Figure 3). Questionnaire survey also identified that 70.2% of local peoples were grazing their livestock almost year round in the CHA. Generally, as the CHA is semi protected area; gazing in the CHA was freely accessed for everybody who is in need of it. Other studies by Stephens *et al. (*2001) in BMNP and Zerihun *et al*. (2012) on Mount Kaka and Hunkolo fragments also revealed that livestock were the most commonly sighted animals in the wildlife habitat.

The other sources of conservation threats that developed negative attitudes towards the CHA was the limited/ absence of benefit sharing for local communities. Even though a number of endemic and other wildlife were killed frequently by professional hunters and the strategy of conservation supports benefit sharing for local communities, yet there were no significant benefit shared to local communities (only Hora-soba village received some benefit). Similar study by Newmark *et al*. (1994) showed attitudes of local people were influenced by the services and benefits that they received from the protected area. Wildlife conservation success depends on the attitudes of people towards conservation (Katrina, 2000). Also Kiss (1990) described that many communities in wildlife areas do not receive benefits and yet they bear the costs of living with wildlife. Therefore, success of wildlife conservation depends on the attitudes of the local population; their positive perception helps conservation programs to be fruitful. But in Hanto all these problems together lead the majority (56.1%) of community to develop a negative attitude towards conservation of the CHA. However, the percentage of current observation of people's attitudes towards conservation of the CHA is notrelated with the findings of Tewodros and Afework (2008) in Senkele Swayne's Hartebeest Sanctuary that noted86.4% opposed the existing wildlife conservation and only 9.5% supported conservation. The reason for the differences might be as Hanto is semi protected; grazing and fire wood collection is not prevented. In addition there is no displaced person from the area like that of Senkele. Therefore, the respondents suggested that future conservation and management of the CHA need to solve the major problems identified during the study period.

Conclusion

The present investigation provides valuable information on human-wildlife induced conservation threats to wildlife in Hanto CHA. The study revealed that, due to human population

increase, human activities like, encroachment to the wildlife habitat, deforestation, animal husbandry, agricultural expansions, dry season forest fire are fueling the loss, degradation and fragmentation of habitats of wildlife. This may leads to greater contact and conflict with humans while wild animals seek to fulfill their nutritional, ecological and behavioral needs. Additionally, insufficient scout number, high number of domestic dogs in the CHA, and negative attitudes of local people towards conservation due to loss of livestock and crop by wild animals and absence of benefit sharing are identified as source of conservation threats to wildlife in the controlled hunting area. As a result, the CHA needs strong attention and immediate action from Rocky valley hunting concession and concerning regional and Federal government institutions. In addition farmers should also cooperatively keep their farm against crop raiders and guard their livestock's day time and build enclosure to prevent them from predators at night. Generally, as the study was the first formal investigation on human-wildlife induced conservation threats to wildlife in the study area, the findings could serve as a baseline to make comparison against future research findings.

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