

Human-Wildlife Conflict in Kafta-Sheraro National Park, Northern Ethiopia

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Abstract: Human-wildlife conflict occurs across the globe; however, developing countries are more vulnerable than developed countries. This is probably due to the rapidly growing human populations and expanding settlements that reduce the areas for wildlife and increasing the interactions between humans and wild animals. This study investigated human-wildlife conflict using a questionnaire survey of 435 randomly selected respondents. The survey was conducted in Kafta-Sheraro national park in 2015. Details of damage events, estimates of crop loss and human-wildlife conflict mitigation options were collected. We also used park archives data on species abundance and diversity collected during December 2014 using 11 line-transects and massive involvement of scouts (n=90). We found that mainly crop depredation (elephant) and livestock depredation (spotted hyena, leopard and jackal) were primary and secondary reasons for human-wildlife conflict in the study area. Majority (45.33%) of the respondent's experienced crop and livestock depredation, some (36.8 %) experienced livestock depredation, while some (17.69%) of the respondents experienced crop depredation. Most respondents (96.87% farmers and 97.98% extension workers) suggested that increasing competition for natural resources and living space as the main cause for human-wildlife conflict in the park. Human-wildlife conflict incidents are widespread in Kafta-Sheraro national park mainly due crop raiding by elephants. Conflict between human and wild animals is an increasing concern because local people depend on agriculture that causes habitat loss in the study area. It is becoming more frequent and severe due to human population growth and activities such as deforestation, settlement, poaching, charcoal production and traditional gold mining. We recommend capacity building of scouts and an awareness raising campaign to create awareness on the need for conservation of wildlife and the park. We suggest further research on mitigating human-wildlife conflict in the area.

Key words: Human-wildlife conflict • Threats • Kafta-Sheraro national park

INTRODUCTION

Historically, throughout the African continent wildlife populations have been rapidly declining mainly due to civil wars, hunting, pollution, poaching and other human interference. Craigie *et al.* [1] provided a first continent-wide assessment, suggesting a 59% decline in large mammal population abundance in Africa's protected areas between 1970 and 2005, with declines in eastern Africa (52%), a collapse in western Africa (85%) and a surprising 24% increase in southern Africa.

Human-wildlife conflict occurs when the needs and behavior of wildlife impact negatively on humans and these conflicts may result when wildlife damage crops, threaten, kill or injure people and domestic animals [2].

Nowadays human-wildlife conflict exists across the world as wildlife requirements encroach on those of human populations and involve several animal species [3, 4]. Though human-wildlife conflict occurs across the globe, developing countries are more vulnerable than developed nations [5]. This is related to the rapidly growing human populations and expanding settlements are reducing the areas left for wildlife habitat and increasing the interactions between humans and animals [6, 7]. As wildlife habitat becomes more and more fragmented wildlife populations are increasingly coming into contact [4, 8].

Ethiopia is a large and ecologically diverse country [9, 10]. Across Ethiopia, there are many designated protected areas of land including National Parks, Wildlife

Reserves, Priority Forests, Biosphere Reserves and Community Conservation Areas. These not only act as biodiversity ‘banks’, but also provide important spiritual places and centers for traditional ecological knowledge. These protected areas can also have a direct economical benefit; bringing in revenues from tourism and carbon trading [11]. The natural vegetation of the country has been destroyed by human and natural catastrophic and converted into agricultural and pastoral land [12]. As a result, wild animals resources of the country are now largely restricted to a few protected areas [13]. Most protected areas in Ethiopia are increasingly degraded. Land is being converted for subsistence and commercial agriculture, timber used for fuel wood and construction, protected grasslands used for livestock grazing [11]. The loss of forests and other protected land is underpinned by a growing population, unsustainable natural resource management, poor enforcement of existing legislation, uncertain land tenure and very low public awareness of the impact of climate change and the importance of biodiversity and ecosystems [11].

Human-wildlife conflict incidents are widespread in Kafta-Sheraro national park in northern Ethiopia. One of the major courses of human-wildlife conflict in the park is crop raiding due to elephants. Increasing human population adjacent to the park aggravates this human-wildlife conflict. As human population increases and the demand for resources grow, the frequency and intensity of such conflicts increases [14]. Crop raiding is not a new

phenomenon; it has most likely been occurring since humans first settled down and started practicing agriculture. The damage caused has variable effects on the livelihood of households. The present study was conducted to assess the extent of conflict between the local community and wild animals in Kafta-Sheraro national park in northern Ethiopia.

MATERIALS AND METHODS

Study Area:

The study was conducted in Kafta-Shiraro national park located in western Tigray in northern Ethiopia (Fig. 1.). The park covers 2,176 km² situated in the northwest of Ethiopia between 13° 50' and 14° 23' N and 36° 31' and 37° 29' E, it is established in 2007. Altitude ranges between 550 and 1800 m.a.s.l.. The main rainy season is from July to September, with a short rainy season from February to April with mean annual rainfall about 400-650mm. It conserves 42 mammals 167 birds and 9 reptile species. It hosts larger mammals such as Caracal (*Felis caracal*), Leopard (*Panthera pardus*), Greater kudu (*Tragelaphus strepsiceros*), Oribi (*Ourebia ourebi*), Waterbuck (*Kobus ellipsiprymnus*), Aardvark (*Orycteropus afer*) and Roan antelope (*Hippotragus equinus*) (Shoshani and Yirmed, 2008). The site is extremely important and could be the only site in Ethiopia for wintering Demoiselle Crane (*Anthropoides virgo*).

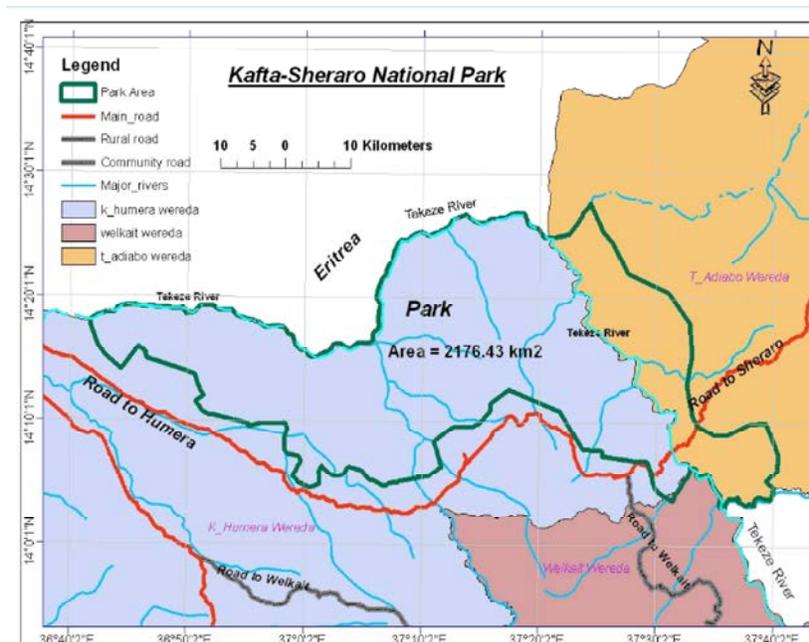


Fig. 1: Continued

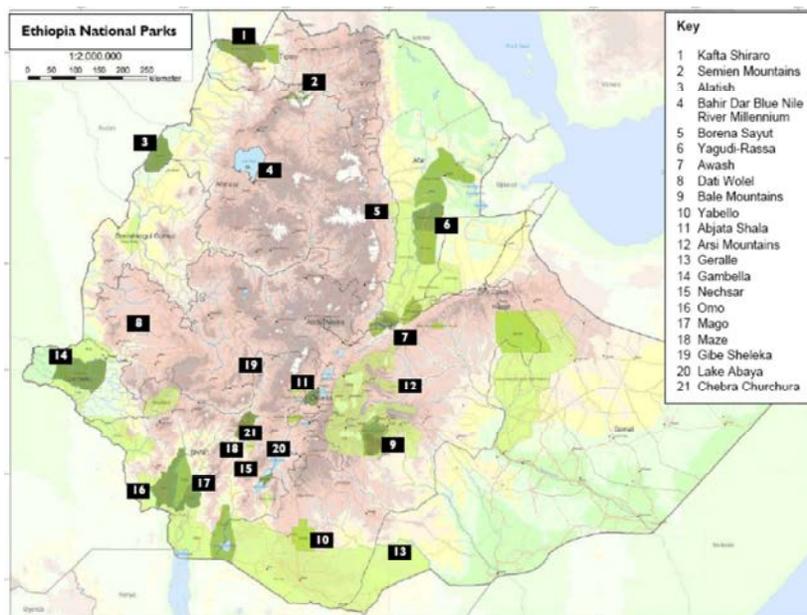


Fig. 1: Map of Ethiopia showing the location of Kafta-Sheraro national and map of Kafta-Sheraro national showing the boundaries of the park

We used semi-structured interviews in nine villages for randomly selected 435 respondents (388 local farmers and 55 scouts and extension workers) in the study area. For random selection we used a random table per study villages. Details of damage events, estimates of crop lose and human-wildlife conflict mitigation options were collected. Focus group discussion was used to investigate human-wildlife conflict with selected farmers and extension workers of the area (n=).

We also used park archives data on species abundance and diversity collected during December 2014 using 11 line-transects and massive involvement of scouts (n=90). This census data is unpublished report submitted to Ethiopian Wildlife Conservation Authority with the reference number Qa/Sh/B/Po/04/07 dated on February 8, 2015.

RESULTS

Community Characteristics: Local farmers depended almost exclusively on subsistence agriculture and the rearing of livestock. A majority (62 %) of respondents were within the age range of 21 – 40 and 146 (33.56 %) of the respondents were illiterate (Table 1). Of the total respondents 439, (353 males and 86 females) and the majority (75%) of the respondents lived for more than 10 years inside the park. Reasons given for the importance of wildlife and the park included its attraction to people,

Table 1: Demographic characteristics of respondents in Kafta-Sheraro national park, northern Ethiopia (n=439)

	Farmers	Extension worker	Total
Gender			
Male	304	49	353
Female	84	2	86
Age			
19- 20	13	0	13
21- 40	271	47	318
41-60	85	4	89
•61	19	0	19
Education			
No formal school	146	0	146
Primary school	202	10	212
Secondary school	34	25	59
Degree	1	10	11

firewood and other benefits such as charcoal, crops, domestic animal feed and enjoyment derived from viewing wildlife.

Community Perception Towards Wildlife and the Park:

The understanding of the respondents on the ownership of the park indicated that most of them (68.88%) believe that the national park is the property of the government. Only a minority of the respondents (24.2%) say the park belongs to the community. A majority (70.6%) suggested that the park should be

owned by either community or by both government and the community. Some respondents (29.4%) proposed that the park should be owned by government. Almost all respondents indicated that the park reduces their agricultural and grazing areas.

Reasons for Human-wildlife Conflict: Conflicts common in the park during the study period were mainly crop depredation (elephant) and livestock depredation (spotted hyena, leopard and jackal). Majority (45.33%) of the respondent's experienced crop and livestock depredation, some (36.8 %) experienced livestock depredation, while some (17.69%) of the respondents experienced crop depredation. Most respondents (96.87% farmers and 97.98% extension workers) suggested that increasing competition for natural resources and living space as the main cause for human-wildlife conflict in the park. The growing population requires more land for agricultural and settlement and these are at the expense of wildlife resources. The maximum damage on crop due to wild animals was estimated to be greater than 31 quintals, which 40.58% of the farmers and 48.5 % of the extension workers responded. Similarly the maximum damage on domestic animal was greater than 31, which was responded by 58.12% of the farmers.

During focus group discussion, discussants raised the unique behavior of ape and monkey. The unique behavior of the ape and monkey of KNP unlike the other apes and monkeys, they eat sheep and got. The public said that the meat eating behavior of the ape and monkey was observed after the 1984/1985 famine, whereby many sheep and got died in the open field and at the same time, as it was a drought and there was no food for these animals and then they started eating on the dead body of sheep and got. The discussants thus consider the apes and the monkeys are attacking the livestock of the residents.

Species Diversity and Abundance in Kafta-sheraro National Park: We used the park archives in order to determine abundance of species that exist in the park. A total of 28 mammal species were reported to exist in Kafta-Sheraro national (Table 2). The most abundant mammal species in the park were *Papio anubis* and *Chlorocebus aethiops*, which account 44% of the total population. On the other hand the least encountered species were *Acinonyx jubatus* and *Mellivora capensis*.

Table 2: Mammals of Kafta-Sheraro national park

no	Scientific name	English name
1	<i>Loxodonta africana</i>	African elephant
2	<i>Xerus rutilus</i>	Unstrapped ground squirrel
3	<i>Hystrix cristata</i>	Crested porcupine
4	<i>Tragelaphus strepsiceros</i>	Greater kudu
5	<i>Hippotragus equines</i>	Roan antelope
6	<i>Taurotragus oreyx</i>	Eland
7	<i>Gazelle rufifrons</i>	Thomson's grant gazelle
8	<i>Kobus ellipsiprymnus</i>	Defassa waterbuck
9	<i>Sylvicapra grimmia</i>	Bush duiker
10	<i>Madoqua saltiana</i>	Dikdik
11	<i>Ourebia ourebi</i>	oribi
12	<i>Oreotragus oreotragus</i>	Klipspringer
13	<i>Phacochoerus africanus</i>	Common warthog
14	<i>Precavia habessinica</i>	Ethiopian rock hyrax
15	<i>Ichneumia albicauda</i>	White tailed mongoose
16	<i>Galerella sanguinea</i>	Slender mongoose
17	<i>Civettictis civetta</i>	African civet
18	<i>Crocula crocuta</i>	Spotted hyena
19	<i>Canis aureus</i>	Common jackal
20	<i>Canis mesomelas</i>	Black-backed jackal
21	<i>mellivora capensis</i>	Honey badger
22	<i>Papio anubis</i>	Anubis baboon
23	<i>Chlorocebus aethiops</i>	Grivet monkey
24	<i>Lepus habessinicus</i>	Abyssinian hare
25	<i>Orycteropus afer</i>	Aardvark
26	<i>Panthera pardus</i>	Leopard

Source: archives of Kafta-Sheraro national park

Anthropogenic Impact on the Park: We witnessed many anthropogenic impacts such as fire, cutting trees, keeping wild animals inside the park, many species illegally hunted/ poaching, domestication of wild animals and farmland in the park. However fire, cutting trees and keeping wild animals inside the park were ranked first, second and third threats in the park.

DISCUSSION

This survey is very significant for conservation of wildlife in Kafta-Sheraro national park. Livestock encroachments, burning of forests, deforestation, traditional gold mining, poaching and agricultural expansion were the main anthropogenic threats in the park that negatively impact populations of wildlife. The impact of human on the wildlife is primarily on their habitat and it is very likely to continue this loss of habitat from illegal hunting, livestock grazing, forest fire, illegal settlement and agricultural expansion. In Ethiopia, 40 protected areas

cover roughly 16.4% of the country's land area (186,000 km²) and these areas face many challenges due to growing populations, border conflicts and recurring drought [15]. A chronic and growing issue for Ethiopia's largely pastoral rural people is local access to grazing lands [16, 17].

Local people make extensive use of any easily accessible areas of forest to satisfy their needs such as fire wood, charcoal and construction material. These anthropogenic pressures resulted greatly in habitat loss. There is elephant poaching for ivory trade. Conflict between humans and wildlife a widespread and intractable issue facing conservation biologists today [18]. Humans have profoundly impacted wildlife and the environment in many ways, through habitat loss, pollution, introduction and spread of exotic and invasive species, overexploitation and climate change. Human-wildlife conflicts vary according to geography, land use patterns, human behavior and the habitat and behavior of wildlife species or individual animals within the species [19]. Human-wild animals' conflict forms in all ecological zones are crop destruction, killing of domestic animals and human death and injuries [20]. Human-wildlife conflict is one of the most widespread issues in conservation [21, 22]. These conflicts can impose a wide range of costs upon local people, varying from livestock predation [23], crop-raiding [24], attacks on humans [25] and disease transmission [26].

Our results suggest that community perceptions towards wildlife conservation and the park were negative indicating very low support of local communities to protect the park and wildlife species. Mutually supportive relationships between communities and nearby protected areas are critical to the long-term success of conservation efforts [15]. In 1991, community-based conservation programs were established in several Ethiopian national parks in an effort to gain local support for conservation [15]. Given the recurring nature of conflict between conservation and local communities, it is critical that conservationists better understand local views with respect to wildlife and protected areas [15].

CONCLUSION

Human-wildlife conflict incidents are widespread in Kafta-Sheraro national park mainly due crop raiding by elephants. Conflict between human and wild animals is an increasing concern because local people depend on

agriculture that causes habitat loss in the study area. It is becoming more frequent and severe due to human population growth and activities such as deforestation, settlement, poaching, charcoal production and traditional gold mining. The main causes of human wild animals' conflict were habitat loss, agricultural expansion in the park, livestock depredation and crop raiding especially by elephants. Crop raiders cause significant loss on farmers' production.

Recommendation: We believe that this information is crucially important for a better understanding of the potential actions of local people. We recommend capacity building of scouts and an awareness raising campaign to create awareness on the need for conservation of wildlife and the park. We suggest further research on mitigating human-wildlife conflict in the area.

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