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LIVING WITH WILDLIFE AND ASSOCIATED CONFLICTS IN A CONTESTED AREA WITHIN THE NORTHERN GONAREZHOU NATIONAL PARK, ZIMBABWE

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ABSTRACT

Human-wildlife conflicts (HWC) are a common phenomenon world-wide, particularly in areas where humans and wild animal's requirements overlap. In this study we focused on the nature of HWC in an area occurring within the northern Gonarezhou National Park (GNP), Zimbabwe. We collected data using focus group discussions, key informant interviews and field observations in January–February 2011. Our results show that elephant, lion and spotted hyena were identified as the main problem animals. Setting fires around fields at night, burning chilli pepper mixed with elephant dung, scaring animals by beating drums and shooting in the air, linearization of huts in order to block elephants from accessing the fields, herding and kraaling livestock were the common methods employed to minimise HWC. It is suggested that a combination of HWC control strategies and establishing a temporary barrier would help to minimise HWC in northern GNP.

Keywords: Conservation, human-wildlife conflicts, large carnivores, large herbivores, protected area

INTRODUCTION

Human-wildlife conflicts (HWC) is a world-wide phenomenon (Kamweya, Ngene, & Muya, 2012; Kgathi, Mmopelwa, Mashabe, & Mosepele, 2012). HWC is a term commonly used by conservationists to describe friction between wild animals and people (Monney, Dakwa, & Wiafe, 2010). HWC has also been referred to as land-use conflict (Omondi, Bitok, & Kagiri, 2004). It is a growing problem, which threatens both human lives, livelihoods and the survival of wildlife throughout the world (Granados & Weladji, 2012; Packer, Ikanda, Kissui, & Kushnir, 2006) as a result of increasing human populations, loss of natural habitat, and, in some regions, growing wildlife populations resulting from successful conservation programmes (Granados, Weladji, & Loomis, 2012; Madden, 2006; Saberwal, Gibbs, Chellam, & Johnsingh, 1994). Additionally, the conflict is linked to other factors such as poor land-use planning and flawed development policies (Madden, 2006).

People and wildlife increasingly compete for area and food as human populations grow and wildlife habitats shrink, and the impact of HWC on crops, livestock, and life at the "hard edge" can be huge (Hanks, 2006). HWC reduces local support for conservation and engenders resentment and opposition to it (Gadd, 2005; Madden, 2006). According to Datta-Roy, Ved, & Williams (2009), there are four different situations when wild animals can come into conflict with humans: i) direct threat to human life, ii) destruction of property by wild animals, iii) direct competition for forage between domestic livestock and wild herbivores, and iv) damage of agricultural crops by wild animals. Therefore, HWC

have potential to negatively influence the sustainable development and sustainability of local communities, especially those, living on the edges of protected areas where conflict is high.

Accordingly, in many parts of the world the conflict between local people and wildlife is probably the most serious problem experienced by those living within and/or adjacent to nature reserves (Davis, 2011; Kaltenborn, Bjerke, & Nyahongo, 2006; Newmark, Leonard, Sariko, & Gamassa, 1993; Pérez & Pacheco, 2006). Considering the magnitude of the problem and the emotions HWC elicits, it is therefore, important to contribute information on HWC in a contested area, Chitsa community occurring within the northern Gonarezhou National Park (GNP), southeast Zimbabwe. Specifically, the objectives of this study were to: 1) identify the wildlife species that are regarded as problematic, 2) determine the nature of problems or conflicts and 3) determine the measures that are employed to minimise the conflicts in the contested area within the northern GNP.

METHODS AND MATERIALS

Study area

This study was carried out in a contested area, namely Chitsa community within the northwestern GNP, comprising of 10 villages and 740 households, occupying approximately 45 km^2 in extent (Fig. 1). A more detailed description of the study area is provided by Gandiwa, et al. (2011), Muboko (2011) and Tavuyanago & Makwara (2011). There is a wide variety of large herbivore species in the GNP and these include African buffalo (*Syncerus caffer*), waterbuck (*Kobus ellipsiprymnus*), plains zebra (*Equus quagga*), blue wildebeest (*Connochaetes taurinus*), and African elephant (*Loxodonta africana*). The park has a number of large carnivores such as cheetah (*Acinonyx jubatus*), lion (*Panthera leo*) and spotted hyena (*Crocuta crocuta*) (Gandiwa, 2012).

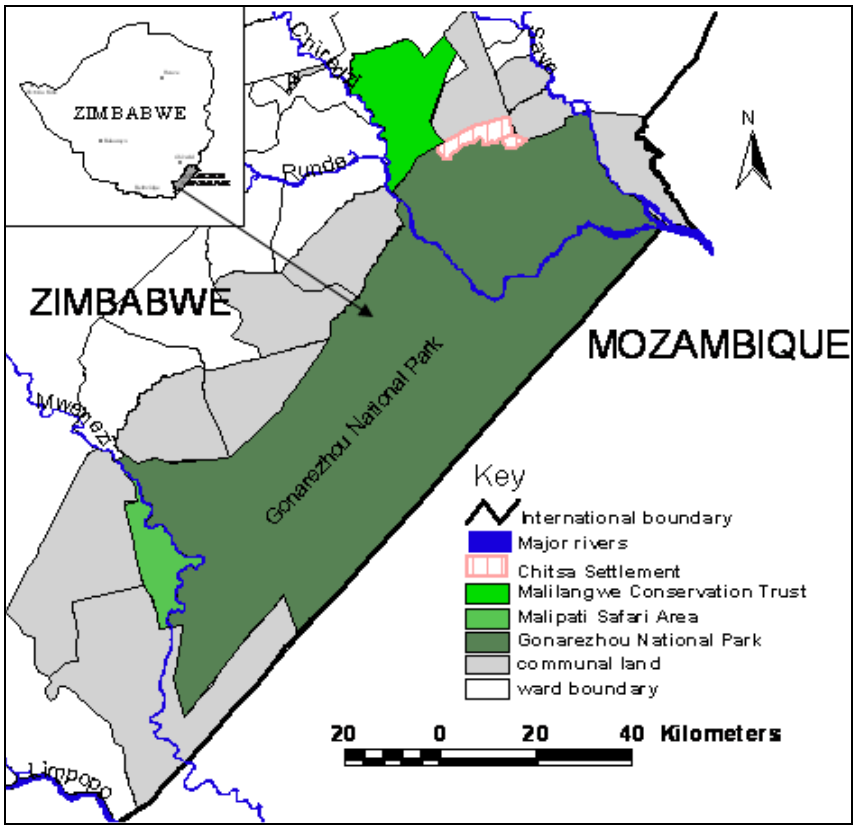

Figure 1: Location of the contested area, namely Chitsa settlement, within the northern Gonarezhou National Park, Zimbabwe. Source: Gandiwa & Zisadza (2010).

Data collection and analysis

Data were collected at the peak of the HWC in January–February 2011. To thoroughly explore the questions surrounding the conflicts we used three methods to gather data for this study: a) a focus group discussion with 20 community members, i.e. two representatives from each village, b) interviews with key informants, and c) field observations in the form of visits to the affected fields in order to have an appreciation of the nature of the conflicts between humans and wildlife. Field observations comprising visual observations, physical inspection of fields through field excursion with a group of farmers were conducted at both affected and non-affected fields. Collected data were summarised using descriptive statistics and qualitative approaches.

RESULTS

Problem animal species in Chitsa settlement within the northern GNP

We recorded that in all the 10 villages in Chitsa community within the northern GNP, crop raiding was a common problem that existed, especially, between humans and elephants. Furthermore, lions and spotted hyenas were mentioned as problem animals by the discussants (Table 1). Lions and spotted hyenas were cited to be a threat to livestock rearing through livestock depredation.

Table 1. Problem wild animal species in Chitsa settlement within the northern GNP (*n* = 10 villages)

Common name	Scientific name	Number of villages where the animal was considered a problem	Percentage (%)
Elephant	*Loxodonta africana*	10	100
Spotted hyena	*Crocuta crocuta*	5	50
Lion	*Panthera leo*	4	40

Source: Field work–2011

Nature of the HWC problems in Chitsa settlement within the northern GNP

Elephants were reported to invade fields, raid crops, destroy vegetable gardens, fences and other infrastructure (Table 2). Local villagers reported that elephants fed and trampled crops in the fields. Crops mostly grown in the study area are presented in Table 3. Maize and cotton were the common crops grown. Villagers named sorghum as the crop most often destroyed by elephants. Consequently, some fields with sorghum suffered repeated raids that resulted in heavy losses. Other crops cited as being preferred by elephants included maize and ground nuts. Crop raids by elephants on fields were reported to be highly seasonal, with most crop raiding cases occurring in the growing season from December to April. Crop raiding was reported to occur usually during early morning before 04:00 hours and late evening, after 19:00 hours. The size of the elephant's crop raiding herd were reported to vary between fields, but ranged from 2 to 15 animals. Discussants mentioned that most damage was recorded when elephants with calves invaded their fields. In addition, discussants specifically mentioned that spotted hyenas attacked livestock, mostly cattle and goats at night even in the kraals.

Table 2. Common problems as a result of the HWC in Chitsa settlement within the northern GNP

i) Crop damage and garden destruction
ii) Loss of livestock to large carnivores
iii) Fear to move at night and at times during the day by the local residents and school pupils
iv) Injury to humans especially by elephants
v) Social disruption of family units as men and young boys spend more time at night guarding the fields in makeshift huts during the cropping season. This also probably led to school drop-outs by some young boys as they spend more time in the fields at night and herding cattle during the day
vi) Negative attitudes towards wildlife as a result of HWC
vii) Destruction of infrastructure including houses, granaries and garden fences
viii) Fear of disease transmission amongst people, livestock and wildlife

Source: Field work–2011

Table 3. List of crops commonly grown in the fields in Chitsa settlement within the northern GNP.

Common name	Scientific name
Sunflower	*Helianthus annuus*
Maize	*Zea mays*
Sorghum	*Sorghum vulgare*
Cotton	*Gossypium* spp.
Groundnuts	*Arachis hypogaea*
Round nuts	*Voandzeia sublerranea*
Watermelons	*Citrullis lanatus*
Pumpkins	*Cucurbita maxima*

Source: Field work–2011

Methods used to minimise HWC in Chitsa settlement within the northern GNP

Local villagers in Chitsa community have developed several measures to minimise crop raiding elephants from their fields and livestock depredation. Some of the reported methods include guarding fields in makeshifts huts at night, setting fires mostly at the edges of the fields at night (also used to burn chilli pepper and elephant dung) and scaring animals by beating drums and cracking whips mostly at night (Table 4). For example, mostly men were reported to spend some nights in makeshift huts in the fields to protect their crops from crop raiding by elephants (Figure 2). Furthermore, the Zimbabwe Parks and Wildlife Management Authority staff in northern GNP was reported to be increasingly using diverse strategies to mitigate the crop raiding activities of wild animals in northern GNP when called to assist and thereby improving the attitudes to conservation by local people. The mitigation methods used by the GNP rangers include scaring animals away from crops, lethal control and educating the community on HWC mitigation measures and/or methods.

Table 4. Methods currently being used to minimise HWC within Chitsa settlement in GNP

i) Setting fires at the edges of the fields at night
ii) Beating drums and cracking whips close to fields at night
iii) Erecting fences around the fields
iv) Linearization of human settlements along the fields as a way to block elephants accessing fields
v) Chilli pepper and elephant dung burning at the edges of the fields at night
vi) Clearing trees along the roads for visibility and easy sighting of elephants
vii) Scarring away problematic wild animals and at times lethal control of elephants by the Parks Authority
viii) Training community members on HWC and Problem Animal Control strategies by non-governmental organisations and Parks Authority
ix) Herding cattle during the day
x) Constructing and maintaining livestock kraals to minimise livestock depredation by large carnivores

Source: Field work–2011

Figure 2: Makeshift hut and fires as methods to minimise HWC in Chitsa community within the northern GNP. Photos: P. Gandiwa. Source: Field work–2011.

DISCUSSION

Local people in Chitsa settlement area, a contested area, within the northern GNP reported that elephants, lions and spotted hyenas were the main problematic animals. This may suggest that local people have challenges in controlling these animal species. It is likely that the underlying factor in the crop-raiding problem is the encroachment of settlements and fields within the northwestern portion of GNP since the settlement of Chitsa community in the year 2000 (Gandiwa, et al., 2011; Muboko, 2011). Local people reported that crop raiding reached peak in the wet season whilst the least raids occurred in the dry season. According to Wolmer, et al. (2004), the first crops were planted by Chitsa community in the northwestern portion of GNP in the 2001–2002 planting season. However, herds of elephants not only destroyed the growing crops but also ripped down people's newly built huts (Wolmer, et al., 2004). Elsewhere, similar conflicts

involving elephants were reported in Okavango Panhandle in Ngamiland, northern Botswana (Woodroffe, Thirgood, & Rabinowitz, 2005). It has been suggested that rainfall may indirectly influence crop-raids by directly affecting the growth and maturation of crops (Danquah, Oppong, & Sam, 2006). Therefore, rainfall has an interesting effect on crop raiding; it encourages raiding in the crop-growing period while the reverse occurs in the dry season due to the unavailability of crops in the fields. Consequently, understanding the timing of raids and selection of crops can help design locally appropriate mitigation and management strategies (Webber, Sereivathana, Maltby, & Lee, 2011).

The present study gives insights to the nature of HWC on communities in the contested area within the northern GNP. It has been reported that factors affecting levels of crop raiding by wild animals include location, crop species grown, season and animal density in the adjacent or inside the protected area (Fungo, 2011). Moreover, HWC are influenced with the expansion of human community into wildlife areas, likely leading to increasing occurrences of human-elephant conflicts (Le Bel, et al., 2010), as recorded in this study. The economic and emotional costs of human-wildlife interactions within the contested area in northern GNP may be quite enormous, both at the household and community level. Wildlife related damage, fear induced by wildlife presence and disruption in social systems especially in the crop growing season points to the fact that the HWC may result in negative impacts on social life, household income, food security and potential conflict between the park management and Chitsa community. More research is however, needed to illuminate the economic and social impact on HWC on the study community.

The need for effective resolution of HWC among communities neighboring wildlife protected areas, or inside protected areas is increasing becoming important (Kassilly, Tsingalia, & Gossow, 2008). HWC is a complex problem that requires a combination of approaches to manage the conflict, including the establishment of wildlife barriers, property protection, traditional methods and removal of the specific problem animals (Le Bel, et al., 2010). According to Hill, Osborn, & Plumpter (2002) nonlethal methods for minimising HWC can be separated into three categories namely: i) vigilance methods that aim to alert farmers to the presence of approaching wildlife, ii) passive methods that aim to impede the passage of potential crop-raiding animals using simple physical barriers and deterrents, and iii) active methods to scare off crop-raiding elephants using various forms of disturbance measures such as fires, noisemakers and chemical deterrents. Some of these methods were observed and recorded as being used in Chitsa community in this present study. Additionally, improved livestock management practices are crucial for reducing HWC involving predators. These include improved group herding practices and kraaling cattle at night in strong enclosures. The construction of boma, the presence of watchdogs, and high levels of human activity around bomas has been associated with lower losses to predators in Laikipia District, Kenya (Ogada, Woodroffe, Oguge, & Frank, 2003). However, it should be noted that for any HWC management strategy to succeed, it should be sustainable and therefore, ideally administered by the local community itself (Le Bel, et al., 2010).

CONCLUSION

HWC should be addressed to meet the respective goals of sustainable conservation, development and rural livelihoods sustainability. Therefore, we suggest the following: first, integrating traditional and modern-day scientific methods in order to mitigate HWC. There is need for collaboration amongst stakeholders to develop robust strategies which can be applied easily and cheaply by local communities. For example, the recently developed HWC toolkit which suggests strategies and practical tips to make the increasingly tight cohabitation between people and wildlife safer may contribute

to mitigating HWC in the contested area within the northern GNP if local villagers are fully exposed to the toolkit (see Le Bel, Mapuvire, & Czudek, 2010 for details). Additionally, there is need to intensify human vigilance in the study area. Vigilance is an important component of crop or livestock protection and HWC management. The fear for man normally prevents wild animals from committing damage (Lamarque, et al., 2009).

Second, it may be beneficial to establish a temporally barrier to prevent people from bringing their cattle getting further in the park while at the same time deterring large herbivores from accessing fields in the contested area within the northern GNP. For example, this can be achieved through establishing a fence. Fencing can be considered as a more sophisticated and efficient solution: a) it is more durable, due to the reduced physical pressure from animals; b) it deters a wider range of species and c) it is more aesthetically appealing (Lamarque, et al., 2009). However, the costs of installation are high and also require significant resources for recurrent maintenance. Furthermore, the local villagers should be involved in the consultation process to ensure that villagers take ownership of the fences for maintenance purposes and to ensure reduced vandalism of the fence.

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