

Perceived impacts of veterinary fences on local live-lihoods in northern Gonarezhou National Park, Zimbabwe

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Abstract

The role of veterinary fences in wildlife conservation and livestock production has increasingly been receiving attention in semi-arid ecosystems. Previous research has shown that veterinary fences play an important role in reducing disease outbreaks between wildlife, humans and domestic livestock; enhances security in wildlife conservation and reduces human-wildlife conflicts. However, the establishment of veterinary fences in some protected areas has led to conflicts between local people and wildlife authorities. This study examined community views of a newly contracted veterinary cordon fence through 78 household questionnaire surveys in a community adjacent to the northern Gonarezhou National Park, Zimbabwe. Data were collected between February and March in 2013. Our results show that despite the key roles that local communities place on the fences, most local people were concerned about reduced livestock grazing area and protected area boundary location. Our study suggests that protected area management and local people relationships are important in the long-term sustainability of veterinary fences demarcating adjoining rural and protected area landscapes. We, thus, recommend for the: 1) effective community engagement in natural resources conservation programs, and 2) development of innovative livestock production systems in areas adjacent to protected areas in savanna ecosystems.

Keywords: human-wildlife conflict, livestock, questionnaire survey, wildlife

Introduction

Protected area networks, notably national parks, are often regarded as the most important mechanism for conserving biodiversity. Most protected areas are commonly associated with management systems, usually characterised by strict regulations based on exclusionary principles, where local people are excluded from accessing areas that they may have previously used to gather natural resources for their domestic use or trade (Gaston et al. 2008). Fences are constructed for a variety of reasons, but their main purpose is to control access (Boone & Hobbs 2004). In protected

areas, fences may improve security from illegal activities and/or delineate boundaries. Some of the reported beneficial aspects of fences include reduction in human-wildlife conflict and disease outbreaks between wildlife and livestock (Taylor & Martin 1987; Lindsey et al. 2012). In contrast, some of the reported detrimental effects of fences include death of wildlife through entanglement, misuse of wires for snares by poachers and alterations in animal migrations across landscapes (Taylor & Martin 1987; Boone & Hobbs 2004; Hayward & Kerley 2009; Jori et al. 2011; Lindsey et al. 2012).

Fences in Zimbabwe have been erected in most protected areas bordering communal

areas by Veterinary Services Department to manage diseases such as trypanosomiasis and foot-and-mouth in areas where wildlife and livestock co-exist (Taylor & Martin 1987). For instance, foot-and-mouth disease is endemic in Zimbabwe, particularly in the southeast of the country adjacent to the Gonarezhou National Park (hereafter, Gonarezhou). Though in rural areas adjacent to wildlife reserves, the presence of a fence is arguably important (Taylor & Martin 1987), it is often a source of conflict as fences are misconstrued as synonymous with land use boundaries, which is not always the case.

However, of late in order to reinforce boundary lines, some protected areas in Zimbabwe, for example, Gonarezhou (Gandiwa & Gandiwa 2013), have increased the enforcement of park boundaries through fencing. This may look contradictory to the growing importance of the community-based conservation approach, but is it? Focusing on perceptions of local people in a community bordering Gonarezhou, Zimbabwe, this paper provides an update of the strengthening of

protected areas boundaries in Gonarezhou by responsible authorities versus local communities' responses to veterinary fences? Understanding local opinion is vital to the success of conservation programmes, especially in areas of expanding human populations.

Methods

Study area

This study focused on Chibwedziva community (ward 8) occurring in Chiredzi district adjacent to the north-western Gonarezhou, Zimbabwe (Fig. 1). We selected this study area because it is representative of a community adjacent to Gonarezhou where a 19 km boundary fence (2.4 m high) was recently erected, i.e., in 2012 (Fig. 2). Chibwedziva, with a spatial extent of about 350 km², saw one of the well documented community-based wildlife management initiative, the Communal Areas Management Programme for Indigenous

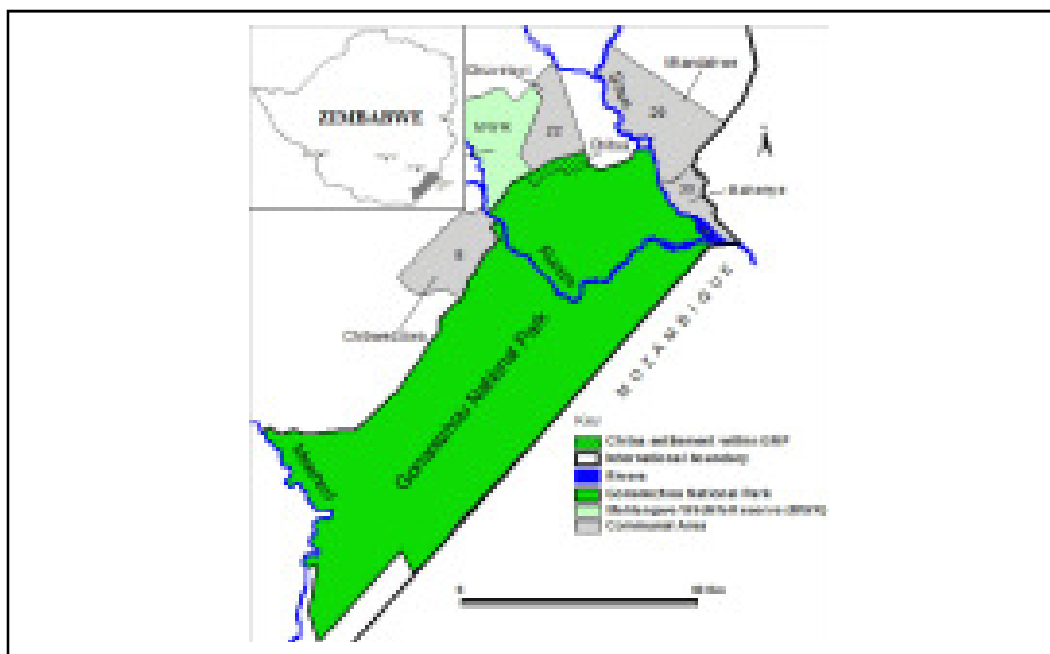


Fig. 1: Location of Chibwedziva community adjacent to the north-western Gonarezhou National Park, Zimbabwe. Source: Gandiwa (2012).

Resources (CAMPFIRE) being introduced in 1993 (Gandiwa et al. 2013). As indicated in Fig 1, Chibwedziva is bordered to the east by Gonarezhou, which was established in the early 1930s as a Game Reserve and upgraded into a national park in 1975 under the Parks and Wildlife Act of 1975. Located in south-eastern Zimbabwe, Gonarezhou covers an area of about 5000 km² and occurs in a semi-arid savanna ecosystem with an average annual rainfall of between 400 and 600 mm. The park is endowed with a wide variety of both large carnivores and herbivore species. Local residents in communities adjacent to the northern Gonarezhou practice a combination of subsistence, cash crop farming and livestock production. The dominant ethnic group in the study area is Shangaan.

Data collection

We conducted face-to-face interviews using semi-structured questionnaires with 78 randomly selected households located close to park boundary in Chibwedziva community between February and March in 2013. Pre-testing of the questionnaire was undertaken in one village that was not part of the selected sample. The most senior member of the household present at the time of the visit was interviewed. For each interviewee we recorded their sex, age, educational background, the number of cattle owned and how long they had lived in the area as background data. Table 1 shows the questions that were asked regarding the interviewees perception about the boundary fence.



Fig. 2: Boundary fence showing some cattle grazing adjacent to northern Gonarezhou National Park, Zimbabwe. Photo credit: E. Gandiwa.

Question	Options provided
Are you happy with the fencing activities being done in Gonarezhou?	Yes/no
What do you think is the fence purpose and associated positive effects?	Open
What do you think are the negative effects of the fence?	Open
What do you think should be done for the fence to co-exist well with local people?	Open
What do you think is the main purpose for Gonarezhou?	Open
Do you have any other comments about the boundary fence?	Open

Table 1: Outline of the semi-structured questionnaire used in the household survey.

Data analysis

Descriptive statistics were used to summarize the questionnaire response data set. Where multiple responses were possible on an open-response question, data are presented as the percentage of respondents giving each response, and may sum to over 100%. Chi-square (χ^2) tests were applied using the Statistical Program for Social Sciences version 19 for Windows (IBM SPSS Inc, Chicago, USA) to find out if the responses occurred with equal probability.

Results

Demography

The sample was comprised of more males ($n = 62$, 79%) than females ($n = 16$, 21%) ($\chi^2 = 25.96$, $df = 1$, $P < 0.0001$). There were no significant differences in the age groups of the respondents with about 21% ($n = 16$) of the respondents being between 21 and 40 years, 41% ($n = 32$) being between 41 and 60 years whereas 38% ($n = 30$) were more than 60 years ($\chi^2 = 5.85$, $df = 2$, $P = 0.054$). However, there were significant differences in educational levels among the respondents ($\chi^2 = 33.38$, $df = 3$, $P < 0.0001$). Accordingly,

thirty-eight percent ($n = 30$) of the respondents had no formal education, 44% ($n = 34$) had primary level education, 13% ($n = 10$) had secondary education whereas 5% ($n = 4$) had tertiary education. The average cattle herd owned by the respondents was 18 (standard deviation [SD] = 10). The respondents' average length of stay in the study area was 47 years (SD = 12).

Perceptions about the boundary/veterinary fence

Overall, most people expressed displeasure with the boundary or veterinary fence ($\chi^2 = 30.78$, $df = 1$, $P < 0.0001$; Table 2). With regard to the purpose of the fence and associated positive effects respondents gave five responses with protecting cattle from thieves across the border with Mozambique recording the highest frequency and the least being reducing disease spread between livestock and wildlife ($\chi^2 = 51.61$, $df = 4$, $P < 0.0001$). The reduction in grazing area for livestock since the park boundary was close to local villages was highlighted as the main negative effect of the fence ($\chi^2 = 33.93$, $df = 3$, $P < 0.0001$; Table 2). There were no significant differences on responses regarding what was perceived as important for the co-existence of the fence and local people

Table 2. Respondents perceptions about the boundary fence, northern Gonarezhou, Zimbabwe.

Categories	Responses	N	%
Are you happy about the fence?	Yes	14	18
	No	64	82
What is the fence purpose and associated positive effects?	Protect cattle from rustlers/thieves	48	52
	Protect cattle and people from wildlife	38	49
	Enhance tourism	18	23
	Show boundary between park and communal area (enhances park integrity)	8	10
	Reduces diseases	10	13
What are the negative effects of fence?	Reduced grazing area since the fence is close to villages	52	67
	Killing of domestic animals and people which poses threat to lives of young children (possible electrocutions)	26	33
	Negatively affecting CAMPFIRE as large herbivores find it difficult to leave the park into the adjacent area	16	21
	Reduced land available for local people	14	18
What should be done for the fence to co-exist well with local communities?	Change location of the fence as the fence is put at the wrong boundary line	32	41
	Engage community and educate local people about the importance of the fence	22	28
	Need to consider local people needs such as grazing	18	23
What do you think is the main purpose for Gonarezhou?	Conserving the national wildlife resources	74	95
	Wildlife is important for tourism (brings foreign currency to the nation)	56	72

despite a relatively higher proportion of respondents mentioning that changing the location of the fence was important ($\chi^2 = 4.33$, $df = 2$, $P = 0.115$). Overall, the park was viewed as important for conserving the national wildlife resources and also as a source of foreign currency to the nation

primarily through tourism ($\chi^2 = 2.22$, $df = 1$, $P = 0.136$).

Furthermore, 41% ($n = 32$) of the respondents suggested that there is need to consider livestock production in the study area as the study area was generally semi-arid in which crop production was not usually

profitable; 33% ($n = 26$) suggested the need to engage communities when establishing fences, i.e., there is need to consider communities in developments in their areas and lastly, 23% ($n = 18$) suggested the importance of undertaking scientific research before fencing to solicit and incorporate local people's views ($\chi^2 = 3.89$, $df = 2$, $P = 0.143$).

Discussion

People are rarely asked what they think about fences that restricts their movement (Chaminuka 2010). Accordingly, to interrogate this common thinking, our study aimed at understanding local people's perceptions about boundary or veterinary fences in northern Gonarezhou. Consistent with McGahey (2011), fences offer both positive and negative impacts on the livelihoods of local people. For example, in this study fences were seen as helping in reducing cattle thefts and illegal trade between the study area and Mozambique. On the other hand, the fence was viewed as leading to reduced grazing area as mostly livestock encroached in the park for grazing (Gandiwa et al. 2011). It would, therefore, appear that the local communities give more preference to the aspects of the fence that affect their daily livelihoods than those concerning biodiversity conservation.

Our findings illustrate that there is a clear dissatisfaction among the local residents about the location of the park boundary where the veterinary fence was erected. The dissatisfaction is partly related to colonial forced settlement relocations when Gonarezhou was established and the subsequent park boundary changes. Similar, park-people conflicts with boundary issues has been reported for the northern Gonarezhou (Mombeshora & Le Bel 2009; Muboko 2011). Moreover, local people feared that the veterinary fence could: a) entangle or electrocute livestock and also pose a hazard to young children, and b) negatively affect

the CAMPFIRE projects in the study community.

The use of park boundary and veterinary fences to separate wildlife, people and livestock is increasingly threatening greater fragmentation of African rangelands and are another important cause of isolation for African protected areas (Newmark 2008) and a factor reported to result in wildlife population declines in some protected areas (Mbaiwa & Mbaiwa 2006). However, the curtailment and eradication of wildlife borne animal diseases has necessitated the use of fencing as a blunt instrument (Ferguson & Hanks 2012). Furthermore, there is need for proper planning in transboundary conservation areas (TFCAs) to ensure that veterinary fences do not negatively affect the objective of local communities living in or close to TFCAs to benefit from biodiversity conservation (Spierenburg & Wels 2006).

While the primary role of protected areas is the conservation of species diversity, biodiversity conservation, along with sustainable resource management, can and must result in material benefits to neighbouring communities. Conservation and poverty reduction need to be tackled together for best results and, as such, achieving local cooperation and support without jeopardising conservation goals has become a top priority for most parks around the world (Taylor & Atkinson 2012). In fact, the skills and ability to strike a balance between social and ecological needs is becoming imperative, an ideology being elevated as depicting an epitome of effective wildlife management and conservation especially in this 21st Century and probably beyond. Moreover, government agencies, rural populations, and the public at large should recognize and support the objectives for which veterinary fences are planned for, and respect the fence physical structure (Taylor & Martin 1987).

Our results suggest that although a high proportion of respondents disliked the fencing activities in the study area, local people see both the positive and negative effects of

veterinary fences on their livelihoods. Our study show that protected area management and local people relationships are important in the long-term sustainability of fences in rural landscapes adjoining protected areas. Moreover, Gonarezhou was largely viewed as important in the conservation of wildlife resources and also as an important source for foreign currency to the nation through tourism. We, thus, recommend for i) further research on the influence of socio-demographic attributes, such as education and gender, on local people's perceptions of veterinary fences and protected areas needs further investigation; ii) community engagement in natural resources conservation programs through improved environmental education and awareness campaigns about biodiversity conservation including the role of

veterinary fences, and iii) development of innovative livestock production systems in areas adjacent to protected areas.

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