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Resident Hunting Ban in Serengeti District and Its Implications to People's Livelihood and Wildlife Population

Abiud L. Kaswamila and Augustino E. Mwakipesile

Abstract

In 2002 Serengeti District Council entered an agreement with Singita Grumeti Reserve Limited to ban resident hunting by compensating the District Council TZS 460 million (USD 200,000) per annum. This study assessed the implications of the ban on communities' livelihood and wildlife populations in the district. Up to 2011 about TZS 1.7 trillion (USD 727, 000) had been paid to the District Council. Findings reveal that communities were not involved in the decision and that the ban had mixed results on community livelihood. Communities mentioned provision of development infrastructures and students' scholarship and increase of game species as benefits emanating from the ban. Denial to access game meat, increased destructive wildlife particularly elephants, misallocation of funds by the Council, increased food insecurity, and killings of people by wildlife were perceived as costs. The study concludes that the ban has significantly boosted the Council's revenues and increased wildlife populations. However, communities have been denied their constitutional rights of hunting and access to cheap source of protein. Further, communities have witnessed increased human-elephant conflict and food insecurity. The study recommends involvement of communities in such major decisions affecting people's livelihood and the need for research before implementing such a decision.

Keywords: conservation, development, Singita Grumeti reserve, human-wildlife conflicts, human-wildlife interactions, ecosystems

1. Introduction

Around the world, resident hunting as part which is generally organized and managed by the state as a public service [1] has proven to be a powerful tool to promote conservation when conducted in ways that are biologically sound within appropriate governance and institutional settings [2]. License fees and taxes are set and taken by the state and in most situations are reinvested in managing the resource. In developing countries apart from conservation, public hunting can be regarded as a source of income as well as a livelihood strategy in terms of food security and in combating malnutrition. On the other hand, public hunting model has not worked effectively for conservation in Africa and other developing regions

such as Central Asia and even Mexico [3]. For example, governance, accountability mechanisms, and state agencies are unable to capture and channel license or tax revenues to manage and support conservation programs as they do in the North American Model [3].

In Tanzania resident hunting is recognized by the wildlife policy [4] which states that it is the right of indigenous Tanzanians to have legal access to wildlife use, and different scales of fees for tourists and residents to hunt have been established through the enabling legislation. The country has over 140 hunting concessions covering an area in excess of 250,000 km² that are licensed to conduct both tourist hunting and resident hunting. These concessions are distributed throughout the country in either Game Reserves and Game Controlled Areas, open areas, or Wildlife Management Areas. Schedules of the Hunting Regulations that support the Wildlife Conservation Act specify types of animals that may or may not be hunted on a hunting license. A wide range of animals (approximately 60 species) can legally be hunted by tourist hunters in Tanzania. However, the giraffe, cheetah, rhino, and wild dog are protected game and cannot be hunted in Tanzania. The Hunting Regulations stipulate the fees for hunting every type of animal and further specify a minimum number of hunting days. Currently there are over 40 hunting outfitters leasing concessions in Tanzania.

In Serengeti District before the 2002 joint venture between Serengeti District Council (SDC) and Singita Grumeti Reserve Limited (SGRL) which banned resident hunting, the latter was undertaken using existing regulations. Resident hunting was formally carried out in Nyichoka and Sibora open areas of Serengeti District. The chapter assesses the implications of the hunting ban on local communities' livelihood and examines the wildlife population trend after the ban.

2. Study area

Serengeti District (10,373 km²) is located on the Eastern part of Mara region (**Figure 1**). The district has 10 wildlife areas, viz., Serengeti National Park (7000 km²), Grumeti Game Reserve (68.37 km²), Ikorongo Game Reserve (189.68 km²), IKONA Wildlife Management Area (WMA) (148 km²), and open areas—IKONA Open Area, Issenye Open Area, Issenye Reminder, Nyakitono Reminder, Robanda Open Area, and Sasakwa, having a total of 2306 km². About 659 km² is the area for agriculture, livestock keeping, and for settlements.

Average rainfall in the area is about 700 mm per annum. The temperatures in the area show a relatively constant mean monthly maximum of 27–28°C. The minimum temperature varies from 16°C in the hot month of October–March to 13°C during May–August. The relief ranges from 1144 to 1380 m above sea level.

This study involved three communities of Natta Mbiso, Machochwe, and Park Nyigoti. The criteria for picking these communities were their traditional link to wildlife utilization and adjacency to former hunting areas and/or protected area networks in the district. As for game population, emphasis was on IKONA WMA, which entered an agreement with Singita Grumeti Reserve Limited (SGRL).

SGRL under a multi-billionaire businessman Paul Tudor II was registered in 2002 and has tourism right tenure over the Grumeti Game Reserve, Ikorongo Game Reserve, and Ikoma Wildlife Management Area. The SGRL which is one of the most ambitious conservation and tourism projects in Africa is a private game concession and has excellent year-round game viewing and is also ideally placed for annual wildebeest migration. Currently SGRL project operates three 7-star tourist lodges in the area: the Sasakwa Hilltop, Sabora plains, and Faru Faru River lodges with a total of 72 beds. The vision of SGRL is rehabilitation and maintenance of the

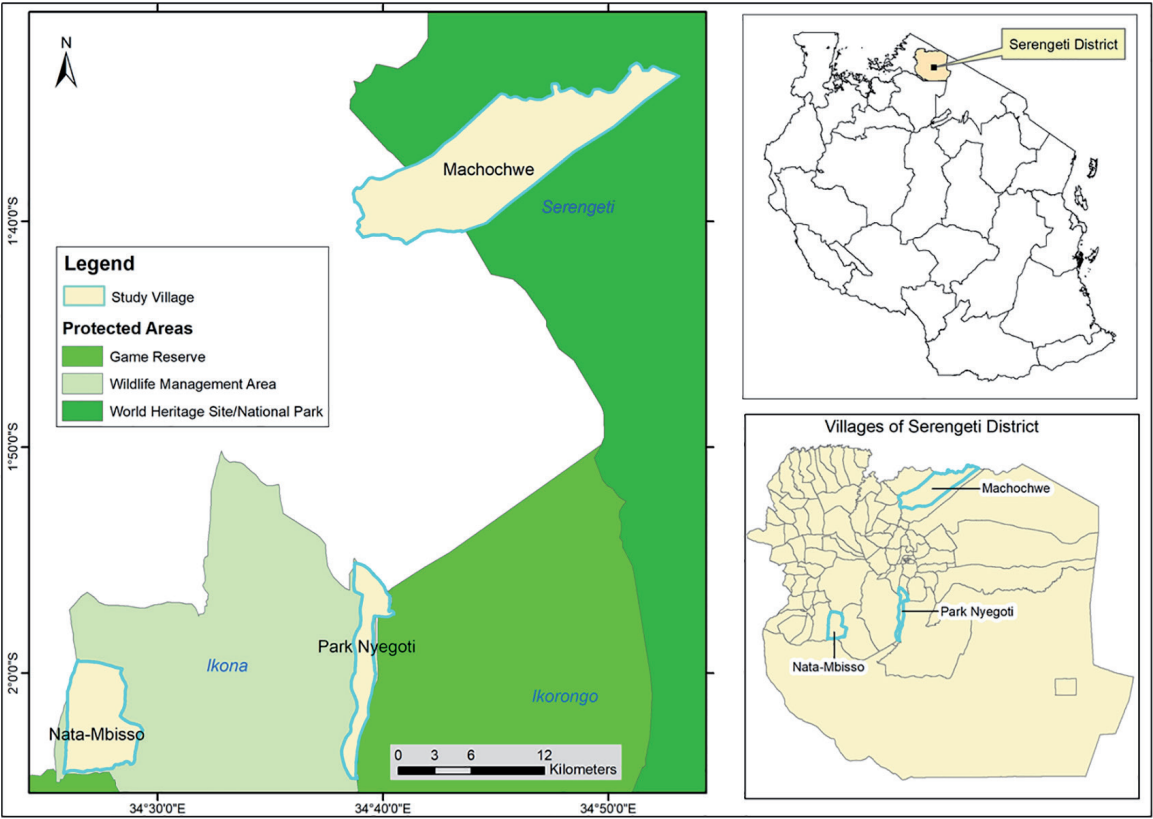


Figure 1.
Location of the study area.

indigenous biodiversity of the western Serengeti-Mara ecosystem for the benefit of the local communities within the Serengeti District and the nation as a whole through structures that are financially and economically sustainable, ecologically and environmentally responsible, and politically acceptable.

From 2003 to 2011 the company had invested a huge sum of money into lodges, community development, and environmental projects in Serengeti and Bunda Districts. Out of this funding, 2.8 and 2.3% have been used for community development projects and wildlife management activities, respectively. Among the community development projects include President Kikwete scholarships, provision of clean and safe water, education, and beekeeping projects.

In 2002 SGRL project entered a joint venture agreement with Serengeti District Council (SDC) on resident hunting ban, and Clause 4.1.6 of the contract states that: “SGRL shall compensate the District Council a sum of TZS 200 Million only for the community development quota allocated to the District Council. The amount will be allocated in a transparent and accountable manner involving all stakeholders in the Serengeti District” (JVA, Pp. 12).

However, SGRL continues with tourist hunting in the former hunting areas incongruent to the joint venture agreement.

3. Methodology

3.1 Socioeconomic data collection

Data involving humans were collected using household questionnaire and structured interviews. The main subjects were households, district officials, and village leaders. Using the village register book, a sample of 30–35 households was picked using simple random sampling technique. Gender balance was considered in

picking the household sample. The sample was approximately 7–9% of the village population and can be argued to be an appropriate sample for the study. A total of 100 household respondents were interviewed. As for District officials, officials involved were the District Natural Resources Officer (DNRO) and District Game Officer (DGO). At village level, Village Executive Officers from the three villages were the main respondents. Socioeconomic data were analyzed using SPSS version 16, and this was supplemented with qualitative data analysis techniques such as content analysis and memoing.

3.2 Wildlife population estimates

Between August 16 and August 21 of 2010, the survey of wildlife (large mammals) was undertaken in the census area (data presented are for IKONA WMA). During game census, the census was preceded by a generally above-average wet season rain. The 2 months prior to the census were, however, well below average. No rain was recorded in August and none fell during the census.

Temperatures were generally moderate to warm. Three methods were applied to estimate wildlife populations in IKONA WMA. These include (i) “known groups” method, (ii) total area aerial counts, and (iii) sample aerial counts. In the “known group method,” an attempt was made to count all groups and individuals in the population by individual and group recognition. This was only suitable for the rarer species, and so far, it was only attempted for the roan antelope.

For aerial counts using a helicopter (90 m above ground), two forms of aerial counts were implemented simultaneously, namely, total area count and sample estimate based on distance sampling principles [5]. The techniques were implemented following the standard procedures as described by [6]. The air speed was between 40 and 60 knots. Transects were flown morning and afternoon, up to maximum of 3 hours. The hottest part of the day was avoided, as animals tended to rest under the shade at this time and as a consequence are more difficult to spot. Data analysis also followed standard procedures [6].

4. Results and discussion

4.1 Demographic characteristics

On average the majority of the respondents were female which formed 46% (N = 100) except in Natta Mbiso where the majority were males (**Table 1**). As for age about 74% were aged between 18 and 45 years implying that the majority of the sample populations were youths and therefore an economically active workforce.

Village	N	Sex (%)		Age (%)				Education (%)		
		M	F	18–25	26–35	36–45	>45	Inf.	Pry	Sec
Park Nyigoti	35	47.4	52.6	31.6	10.5	21.1	36.9	15.8	68.4	15.8
Natta Mbiso	30	54.5	45.5	27.3	13.6	36.4	22.7	0	63.6	36.4
Machochwe	35	35.5	64.5	17.6	23.5	41.2	17.6	11.8	82.4	5.8
Average	33.3	45.8	54.2	25.5	15.9	32.9	25.7	9.2	71.5	19.3

Table 1.
Demographic data of the sample population.

At specific village level, Machochwe and Natta Mbiso had the highest proportion of youths with 82 and 77%, respectively. In terms of education, the majority (72%) had attained primary school education, 9% have not been to school, and 19% had secondary school education and above. Of the three villages, Natta Mbiso had the highest proportion of people with secondary education. This could be attributed to its strategic location as it is along the Musoma-Arusha main road and the village's sub-township nature compared to the remaining two villages.

4.2 Awareness and people involvement in the hunting ban

On average 95% of household respondents in the three villages were aware of the ban (**Figure 2**). The high awareness could probably be attributed to the fact that these communities have for a long time been linked to bush meat hunting and/or consuming. The fact that they are no longer enjoying access to bush meat as it used to be has probably made them to be aware of the ban. On whether they were involved in meetings and/or discussions before implementing the ban, 95% argued that they were not involved at all, and the remaining proportion were not sure.

However, the District Natural Resources Officer (DNRO) and District Game Officer (DGO), when asked about community involvement, both argued that the decision was reached through the Serengeti District Full Council, and therefore councilors being community representatives had the duty to give feedbacks to them. According to Tanzania administrative setup, each ward should have a councilor who is normally elected by village members (aged >18 years). A Ward may consist of more than three villages.

Local communities were further probed to comment on whether the ban has led to conflicts or not. Results indicate that in Natta Mbiso and Machochwe, 92% had the view that the decision has not led to conflicts (**Figure 3**). However, in Park Nyigoti, 62% argued that the ban has led to increased conflicts. Human-wildlife conflicts in particular between elephants and local communities are widespread in Africa and are a major concern for both elephant conservation and rural development [7]. The increase in conflict in this village could be due to its location. The village is almost an island as it is surrounded by several protected areas (Serengeti National Park, IKONA WMA, and Ikorongo Game Reserve). This has made the village to have very little livelihood options mainly because of very limited land for crop production, increased crop destruction, and livestock predation by wild animals.

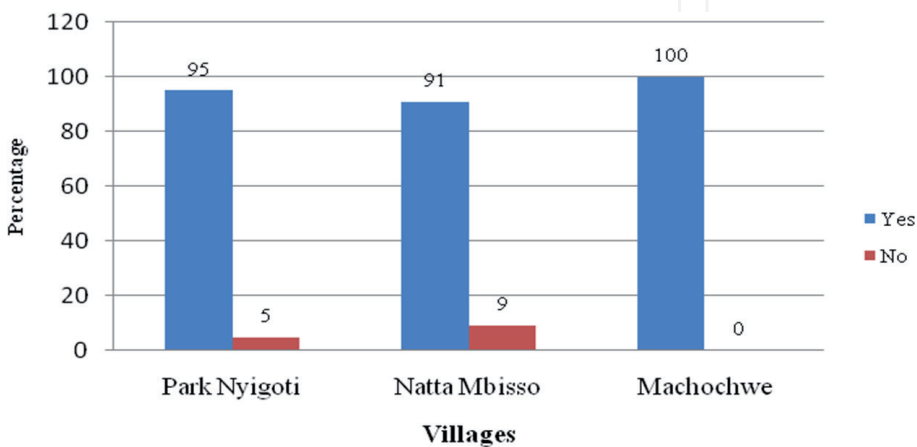


Figure 2.
Awareness on hunting ban.

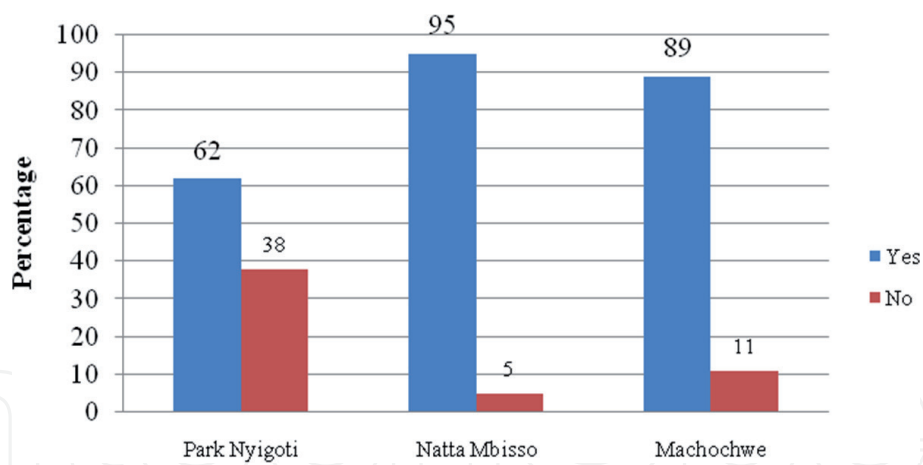


Figure 3.
Ban and increased conflicts.

Park Nyigoti	Natta Mbiso	Machochwe
Construction of dispensary	Employment	Construction of dispensary
Student scholarships	Sell of farm products	
Increased tourists		
Reduced burden on levy		
Construction of deep wells		

Table 2.
Perceived benefits of hunting ban.

Failure to attach conflicts to the ban in Natta Mbiso could be attributed by the socioeconomic benefits local communities are currently enjoying from SGRL. Natta Mbiso currently has a suburban environment as a result of several business enterprises (lodges, hotels, shops, tourist souvenirs, etc.) and the fact that most SGRL employees are settled here. Furthermore, SGRL is currently supporting income-generating enterprises to adjacent communities. As for Machochwe, the possible explanation could be continued poaching as the village boundary is very close to SNP and therefore easy to poach without being easily noticed. In some parts park boundaries are less than a kilometer from the village boundary (Senior Author, pers. Obs.).

4.3 Perceived benefits of hunting ban

Communities had the view that probably the hunting ban has led to increased social services infrastructures (e.g., construction of water wells and dispensary) particularly in Park Nyigoti and Machochwe villages (**Table 2**). The question of what happens to local people is one that remains poorly addressed in conservation literature. This is because it is being produced in an institutional and ideological climate in which there is a widening gap between rhetoric and reality [8]. In such a context [9], it becomes easy to present facile paradigms of how local people will participate in and benefit from conservation interventions.

According to the contract between Serengeti District Council and SGRL, the former is obliged to support social infrastructure developments in the district. SGRL apart from the contribution as per contract also have corporate social responsibility of supporting local communities. In Park Nyigoti other perceived benefits include student bursary, increased tourists, and reduced levy contributions. SGRL

continues to sponsor District Council staff and local communities to pursue different short and long courses within and outside the country. Employment and increased number of tourists were also mentioned as benefits. Selling of farm products such as horticultural crops, meat, eggs, milk, etc. to SGRL staff was also seen as benefit. As for levies, the contribution of SGRL in supporting socio-economic projects has to a greater extent reduced local community contributions toward development projects. On the other hand, wildlife experts viewed increased revenue to Serengeti District Council (SDC) as a benefit since before the initiative the Council used to receive an average of US \$7000/annum (District Game Officer, Pers. Comm).

4.4 Perceived costs of hunting ban

Local community’s perceived costs after hunting ban include decreased cash income, food insecurity, malnutrition, increased human-wildlife conflicts, disease transmission, funds’ failure to trickle down to primary beneficiaries, and denial of human rights (Table 3). Resident hunting has denied village governments and/or local communities to sell game meat, and this has directly denied them from realizing cash income. Local communities used to sell excess bush meat and the former Serengeti Regional Conservation Project (SRCP) had community cropping scheme which made communities to access bush meat at a relatively cheaper price than cattle meat. [10] argue that illegal hunting in the Serengeti has been flourishing, despite stringent law enforcement, because its returns were 45 times greater than those provided legally through the Serengeti Regional Conservation Project community cropping scheme.

Failure to access bush meat has also led to increased protein deficiency in the area. Bush meat was a relatively cheap source of protein, and now most local communities are unable to buy cattle meat due to high price attached to it. During the time of survey, the price of a kg of meat stood at TZS 4000 (US \$ 3). This is a relatively high price taking into account the fact that the majority live below a dollar per day. According to [11], per capita income of communities adjacent to Western Serengeti National Park was about US \$ 280/annum, an equivalent of US \$ 0.77/day.

Increased human-wildlife conflicts were also seen as costs inflicted to communities. The conflicts are of different forms ranging from loss of life due to increased wildlife particularly elephants, transmission of zoonotic diseases to domesticated cattle, and crop destruction by wildlife. Other costs were denial of human rights to access wildlife use contrary to the country’s wildlife policy and failure of funds to reach the wider community. The Tanzania Wildlife Policy has the following statement related to wildlife use: “Resident hunting is the right of indigenous Tanzanians

Park Nyigoti	Natta Mbiso	Machochwe
Decreased income	Decreased income	Decrease in income
Increased destructive animals	Increased destructive animals	Increased destructive animals
Protein deficiency/malnutrition	Lack of game meat	Funds do not reach communities
Increased zoonotic diseases	Increased loss of life	Increased loss of life
	Increased poverty	Food insecurity
	Food insecurity	Denial of human rights

Table 3.
Perceived costs of hunting ban.

Year	Amount in USD (US\$*)
2004	18,000
2005	75,000
2006	85,000
2007	85,000
2008	71,430
2009	142,850
2010	137,900
2011	133,300
Total	727,000

Source: DGO Office—Serengeti District Council.
*1 USD = TZS 2300; NA = not applicable.

Table 4.
SGRL revenue contributions 2004–2011.

to have legal access to wildlife use” [4]. During informal discussion with one resident in Natta Mbiso (located close to SGRL) who preferred anonymity had this to say: “SGRL objective is not for conservation and development but to protect her lodges from disturbances (increase visitor attraction) as they own several lodges in the area including her luxurious lodges such as Sasakwa lodge, Sibora-Grumeti lodge, Zebra-Grumeti, Serengeti, Banguesi, Ramahi and Farufaru lodges.”

4.5 Compensation realized by the district council

Between 2004 and 2011, the Serengeti District Council received compensation from SGRL amounting to TZS 863 million (US \$ 375,217) which in essence was supposed to be used for initiating or improving socioeconomic projects (**Table 4**). Taking into account the fact that the district has more than 50 villages, one can argue that the amount disbursed per village is too little to make an impact on people’s livelihood. For example, if the compensation is equally distributed among 50 villages forming the district, each village will get approximately TZS 4 million/ annum (US \$ 1739) or TZS 11,000/day (US \$ 4.8). With the current average household size of six people in the district, each household is likely to receive about TZS 1833/day (US \$ 0.8). By all standards this is very little money for any meaningful poverty reduction contribution at community level. The game species commonly hunted by residents are mainly impala, Thomson’s gazelle, wildebeest, topi, eland, buffalo, bohor reedbuck, and Grant’s gazelle. Other wildlife species counted during the survey were the elephant, giraffe, hartebeest, and zebra.

5. Population trends for selected wildlife species

The population trends for selected wildlife species in IKONA WMA, that is, impala, Thomson’s gazelle, wildebeest, buffalo, and eland, are presented in **Figures 4–8**. These species are preferred for bush meat. Results indicate that for the first 2–5 years after the ban, the population showed an increasing trend before declining for impala, Thomson’s gazelle, wildebeest, buffalo, and eland (**Figures 4–7**). The increase for the first 5 years before recording a decline could be attributed to fewer disturbances and/or the presence of conducive environment to wildlife. Hunting activities normally disrupt wildlife

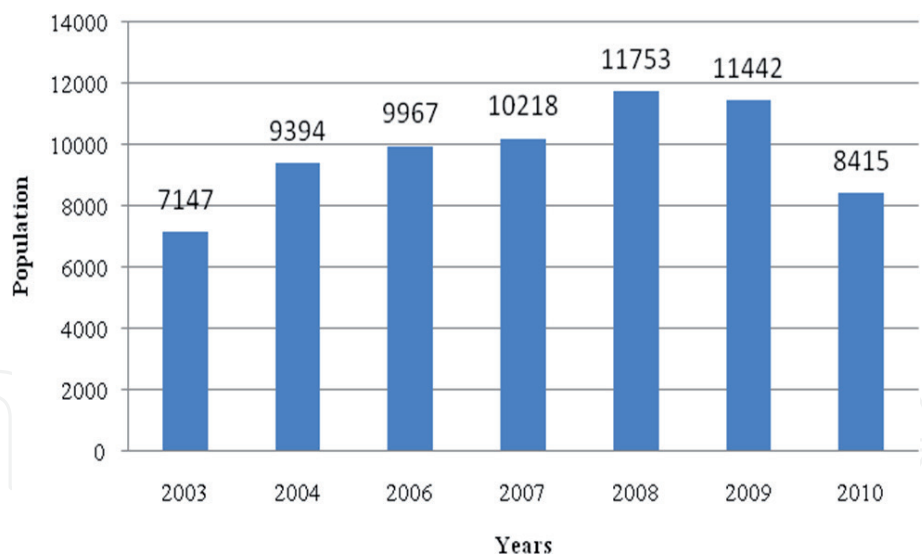


Figure 4.
Population trend of impala.

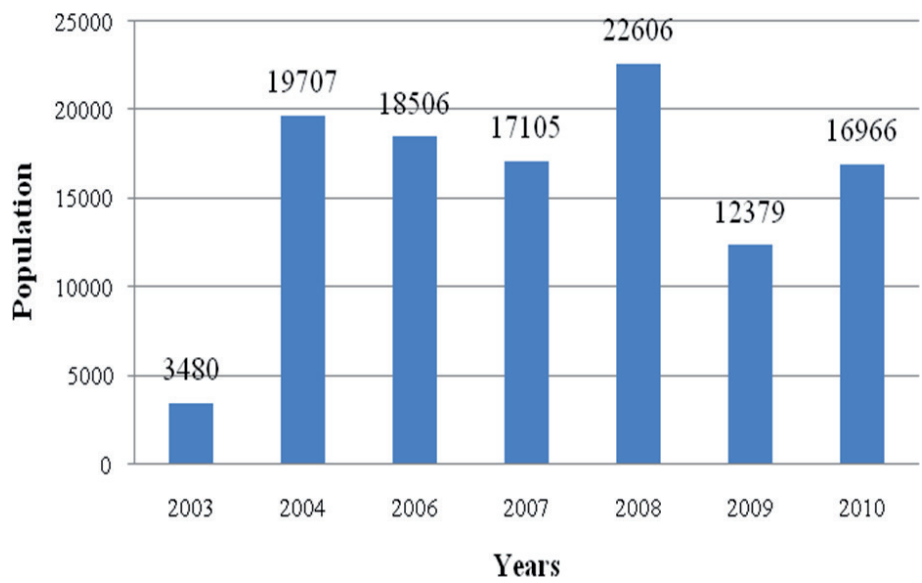


Figure 5.
Population trend of Thomson's gazelle. Source: Goodman [6].

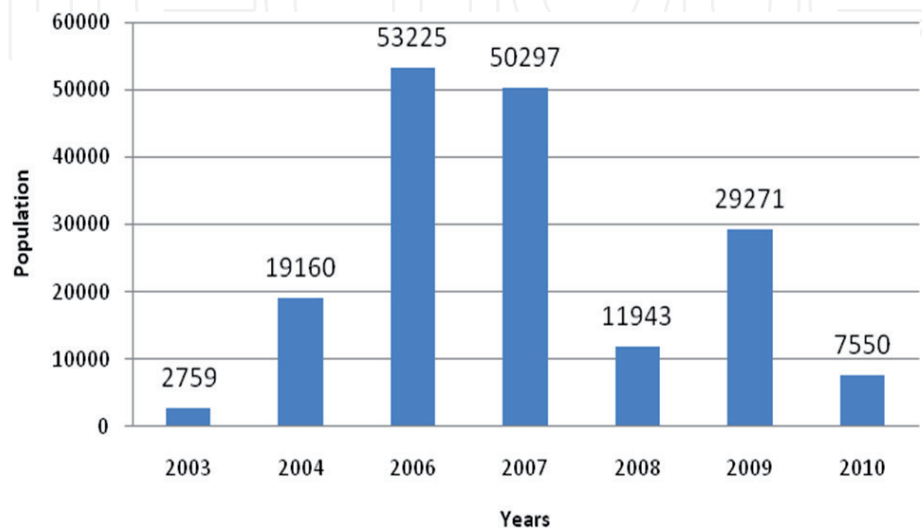


Figure 6.
Population trend of wildebeest.

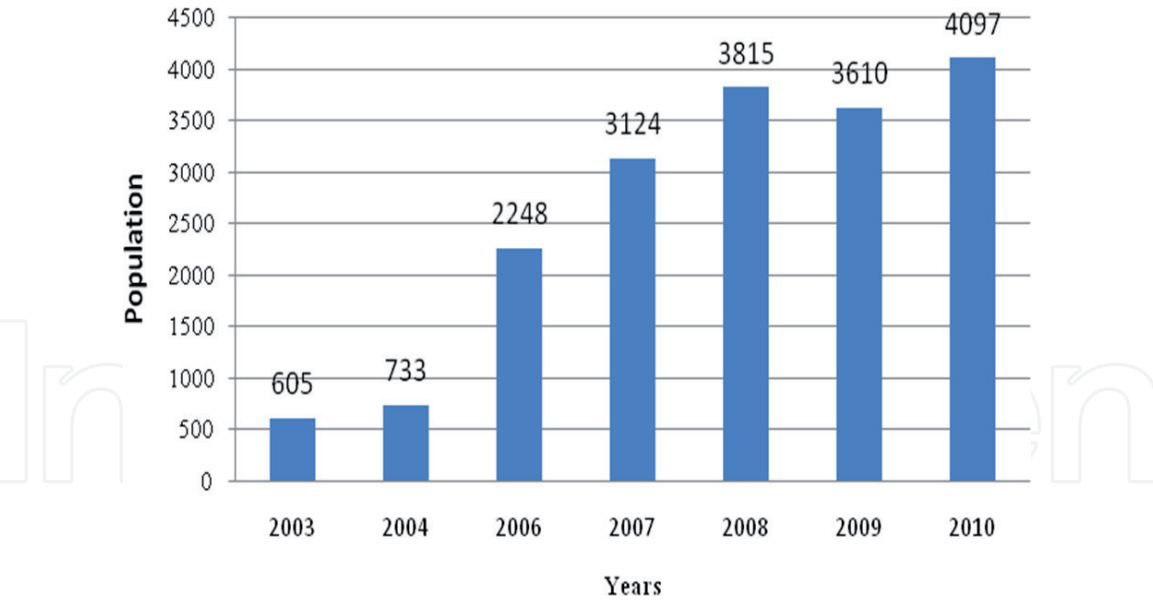


Figure 7.
Population trend of buffalo.

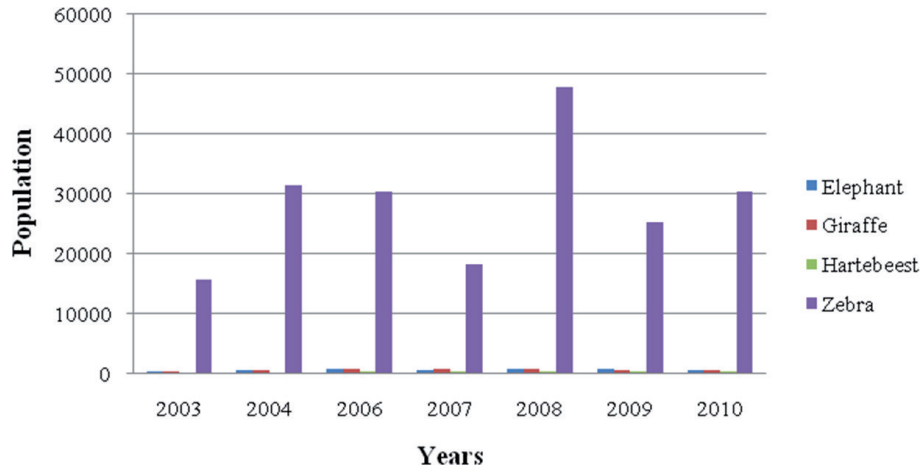


Figure 8.
Population trends for species not in hunting quota. Source: Goodman [6].

ecological systems and make wildlife timid and less productive. The reasons for the decline after the fifth year could not be established. However, this can be attributed to poaching as illustrated in **Table 5**. According to [12, 13], incidences of wildlife crimes and/or animal killed led the wildlife to flee to nearby protected areas and/or distant protected areas particularly for wide-ranging animals such as elephants. The discussion with one elder who preferred anonymity had this to say: “after the ban communities have now intensified poaching to compensate for the previous opportunity of getting bush meat at a cheaper price.”

Population trends for other wildlife species (normally not included in hunting quota in the area), namely, elephant, giraffe, zebra, and hartebeest, are presented in **Figure 8**. Field findings indicate that the population for zebra fluctuated over time, but for the rest (elephant, giraffe, and hartebeest), the population remained constant. For the first 2 years, the population of zebra increased before dropping for 2 years and then rose to the maximum (about 5000) in 2008. It then dropped and rises again. The rise in the first 2 years can be attributed to the safe environment after the ban and availability of habitat. The decline could be associated with hunting for commercial and subsistence. In the study area, zebra meat is highly preferred bush meat by the community due to its deliciousness (Magoiga, pers. comm.).

Year	Wildlife crime incidents	Animals killed	Traditional weapon
2003	147	238	1573
2004	330	824	4826
2005	342	325	3295
2006	481	1387	6160
2007	353	524	371
2008	300	395	2019
2009	315	278	1571
2010	271	406	2792
2011	361	216	2346
2012	238	213	848
2013	266	152	1884

Source: Mwakalobo et al. [12].

Table 5.
Trend of wildlife crime incidents, animals killed, and traditional weapons caught.

6. Conclusion and recommendations

The study concludes that the ban has significantly boosted the District Council revenues. Despite this positive development, the livelihood of the communities has been significantly affected in many ways including increased human-wildlife conflicts, food insecurity, malnutrition, and lack of bush meat which to many is regarded as cheap source of protein. In addition, the ban led to the increase of wildlife populations particularly in the first 2–5 years. This increase corresponded with increased human-wildlife conflicts as a result of crop destruction and livestock predation. The study recommends the need for involvement of communities in major decisions affecting people’s livelihood such as hunting ban. We also recommend that before instituting hunting ban(s), this has to be informed by research.

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Conflict of interest

Authors declare no conflict of interest.

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