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Full Length Research Paper

Patterns of human – wildlife conflicts in Zambia, causes, consequences and management responses

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A study was carried out to determine causes, consequences and management responses of human – wildlife conflicts in Zambia during the period 2002 to 2010. Data was collected by field staff in the four management regions of Zambia Wildlife Authority and analyzed to establish patterns and species responsible for human fatalities, livestock predation, crop damage and other damages to human property. During the period of 2002 to 2008, a total of 347 people were killed or 49 people killed annually by five species of wildlife; crocodile, elephant, hippo, lion and buffalo. Nile crocodile killed the largest number of people 185 (53%) and was the most significant cause of human fatalities, the second was hippo 65 (19%) and elephant was third 63 (18%). There were fewer livestock predation incidences and only 305 incidences were recorded which was 12% less than human fatalities. With regard to livestock, the largest number killed was for cattle 159 (52%) and the least was the dog, 8 (2.62%). Lion was responsible for 157 (51%) of all livestock predation incidences and the least was python 1 (0.32%). The most important livestock predators were lion, crocodile and hyaena. Overall, crocodile was responsible for the greatest number of human fatalities and livestock predation combined, 273 (42%) while elephant was responsible for the largest number of crop damage incidences 1,799 (42%). Further research is required to determine gender and age group of people killed, time of the day and activity conducted by the victims at the time of the fatality incidence. Smaller species such as rodents and red billed quelea should also be considered rather than concentrating on large species such as elephant, hippo and buffalo which have meat value.

Key words: Human-wildlife conflict, crocodile, predation, crop damage, control, retribution.

INTRODUCTION

Conflicts between humans and wild animals are as old as the co-existence between them. They occur in all continents only varying in typology and circumstances. In Zambia, human – wildlife conflicts can be direct when humans are injured or killed by wild animals or indirect when wildlife causes damage to crops, infrastructure such as destroying grain stalls or predation on domesticated stock. When human – wildlife conflicts occur, negative media reporting often exacerbates negative perceptions of the general public towards those species which cause the most conflicts such as the crocodile.

Lamarque et al. (2009) noted that human – wildlife conflicts have been in existence for as long as humans and wild animals have shared the same landscape and resources. Conflicts between humans and crocodiles for instance, were reported in 33 countries spanning the

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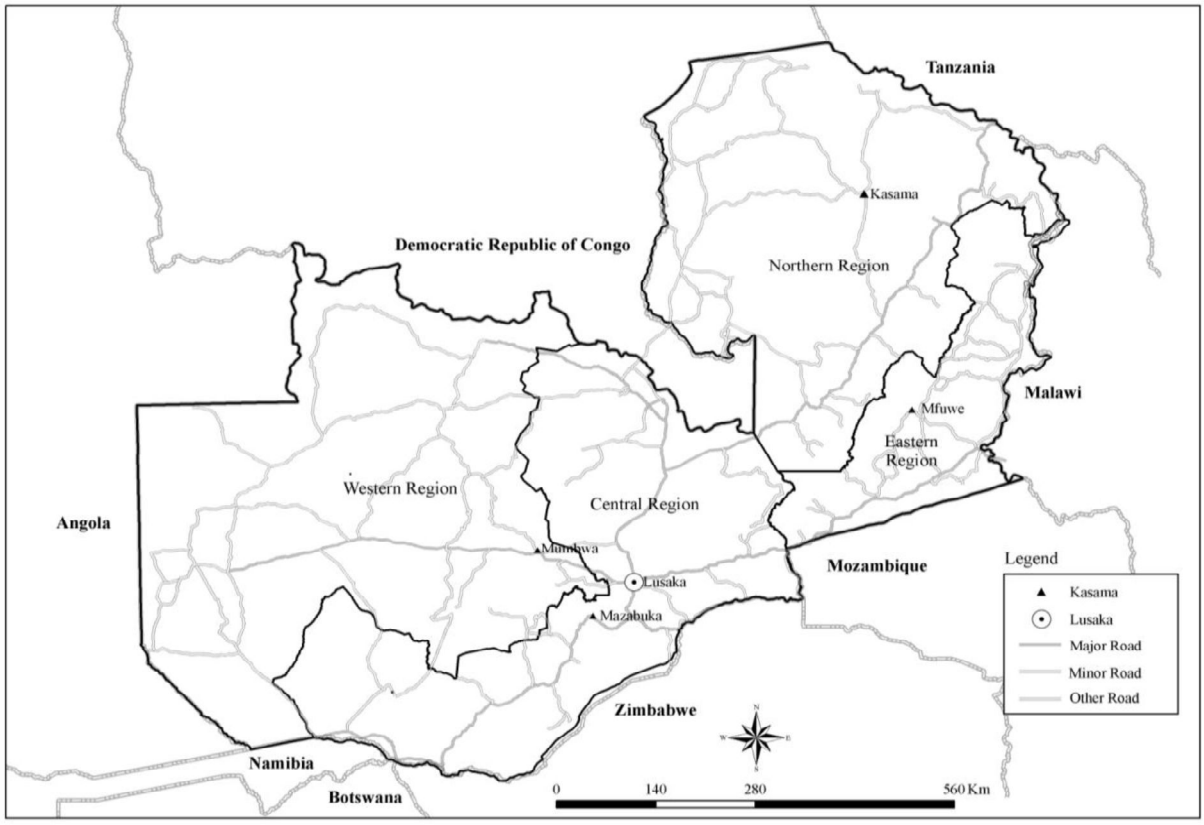


Figure 1. Location of the study area.

tropics and sub-tropics and perhaps many more. All continents and countries, whether developed or not are affected by human wildlife conflicts. It is however, important to distinguish between the level of vulnerability of agro pastoralists in developing countries and that of well – off inhabitants of developed countries.

In analyzing the impact of wild animals on human interests, it is important to consider the species involved and the scale of damage caused. In many instances, it is the smaller animals occurring in vast numbers that may have the greatest impact. Many rodents for instance, can devastate the entire rice crop and cause massive losses to farmers. The red locust (*Nomadacris septemfasciata*), has caused famines across vast swathes of Africa for centuries. Larmaque et al. (2009) estimated losses caused by red-billed quelea (*Quelea quelea)* at US$ 22 million. In Gabon, Lahm (1996) recorded that the number of complaints about grass cutters (*Thryonomys swinderianus)* far surpassed those relating to any other species including elephant.

In Zambia, most of the human-wildlife conflict reports recorded by Zambia Wildlife Authority (ZAWA) involve large herbivores, cats and Nile crocodile (*Crocodylus niloticus)* and no reports were recorded for less conspicuous species such as rodents, birds and insects. These less conspicuous groups may pose the greatest threat to humans and may be responsible for the greatest damage to crops than large animals. This bias towards large animals may be due to the perception often attributed to them being the property of Government and as such communities feel that ZAWA should eventually be responsible for their control and compensation. The other reason could be that the impact of large animals is often traumatic when human life is lost or livestock is killed. The loss of human life often draws attention of the public media and politicians who demand action from ZAWA and Government.

This paper focused on documenting causes, consequences and management responses of human – wildlife conflicts in Zambia, for the period 2002 to 2010. The study also identified the species responsible for such conflicts and areas affected. Such information is critical in the preparation of a comprehensive human-wildlife Conflict Mitigation Strategy (CMS) or Problem Animal Control (PAC) protocol that would guide management responses which are currently lacking.

MATERIALS AND METHODS

The study area covered the whole country which was divided into four regions (Figure 1) and data were collected from each region for the period 2002 to 2010. Data collection followed the established

four regions: Central, Eastern, Northern and Western Regions. In each region, meetings were held to train members on how to identify record and report human – wildlife conflicts incidences. Three sets of forms were prepared; problem animal report, problem animal request for response and problem animal control report. A similar method was used in Zimbabwe in managing problem animal control (Anon, 1997).

Problem animal report

The first part of the Problem Animal Report Form provided for particulars; Name of region, Date of complaint, Date of incident, Name of complainant, Locality (village), GPS location. The second part had the nature of problem; crop damage, livestock maimed or killed, damage done to property such as grain store, injury to humans causing human death. The third part of the form indicated the wildlife species responsible; crocodile, elephant, hippo and lion etc. In the case of crops, the type of crop was indicated as; maize, millet, sorghum and cotton etc. The condition of the crop at the time of damage was also recorded as good, medium or poor. The ages of the crops were also recorded as seedling, intermediate and matured. In examining the extent of damage caused to crops, the dimensions of the whole field and the area of the field damaged were determined by spacing and length and width recorded in metres. The researcher's name and signature and date were entered at the bottom. The forms were then sent to the National headquarters at Chilanga.

Problem animal request for response

This form provided for; date of request, person or institution making the request, office responsible for receiving the request, nature of request being made (for example, to assess the extent of damage caused to crops or to control the animal), name of the animal responsible for and nature of the problem. The person making the request signed and forwarded the form to a designated office in the region.

Problem animal control report

This form provided for the following details: date when the problem animal request for response was received, nature of problem reported, name of the authorized control officer in that region, position held, animal species and numbers against which action was taken, number of animals controlled by shooting, GPS locations of such shooting, distance travelled to shoot the animal on control and number of days taken to control. The form was then signed and deposited in the office of the regional manager. All the three sets of forms were then sent by each region to the national headquarters at Chilanga to enter into a database that would cover the whole country.

Typology of human wildlife conflicts

Information on types of human-wildlife conflicts were collected from the Zambia Wildlife Authority headquarters at Chilanga for the period of 2002 to 2010. This period was chosen, because this is the time when the Community Based Natural Resources Management Programme (CBNRM) was fully implemented after the transformation of the Department of National Parks and Wildlife Service (NPWS) to Zambia Wildlife Authority which improved data collection on human –wildlife conflicts in the local communities. In reporting human – wildlife conflicts, data on date of reporting, date when conflict occurred, type of conflict, species involved, and extent of damage caused in case of crops or infrastructure were recorded. Conflicts were classified as: human death or injury, predation on livestock or injury, crop damage and damage to other human property other than crops such as grain stalls, houses and fences.

RESULTS

Human deaths and predation on livestock

During the period 2002 to 2008, a total of 347 people were killed or 49 people killed annually by five species of wildlife; crocodile, elephant, hippo, lion and buffalo. Of the total, Nile crocodile killed the largest number of people 385 (54%) and was the most significant cause of human fatalities ($\chi^{2,}$ $P< 0.005$), the second was hippo 65 (19%) and third was elephant 63 (18%) (Figure 2). Of the 347 people killed, the largest number of people 140 (40%) (χ^2, $P< 0.05$) were killed in the Western Region, the second was Northern Region 74 (21%), 69 (20%) in the Central Region and the least was 64 (19%) in Eastern Region.

With regard to livestock, during the period of 2004 to 2010, a total of 305 livestock predation incidences were recorded. Of the total livestock predation incidences, the highest were cattle 159 (52%) (χ^2, $P< 0.05$) and the least were dogs, 8 (2.62%). The value of the 159 cattle lost through predation was estimated at US$95, 400 at US$ 600 per cow. Lion killed the largest number of livestock 157 (51%) ($\chi^{2,}$ $P< 0.05$) out of which 97 (61%) were cattles. Lion killed 49 (48 %) goats and 6 (75 %) dogs. Crocodile killed the second largest number of livestock 88 (29%), and the largest number of domesticated pigs 24 (69 %). It also killed the second largest number of cattle after lion 35, (22%) and goats 28 (27%) (Figure 2). The impact of leopard and python on livestock predation were insignificant.

A combination of human fatalities and livestock predation had a total of 652 incidences. Crocodile was responsible for the greatest number of human fatalities and livestock predation incidences combined, 273 (42%) (χ^2, $P<0.05$). The second most important was lion, 178 (27%), hippo 65 (10%) (Human fatalities only), elephant 63 (10%) (Human fatalities only), hyaena 44 (7%) (Livestock predation only), buffalo 13 (2%) (Human fatalities only), leopard 15 (2%) (Livestock predation only) and python 1 (0.2%) (Livestock only).

Crocodile and lion were responsible for the largest number of human fatalities and livestock predation 451 (70%).

Crop damage incidence reports

During the period 2004 to 2010, a total of 4,270 crop damage incidences were reported. The crops recorded were; maize, sweet potato, rice, cotton (*Gossypium* spp), sorghum (*Sorghum vulgare*), mango fruits (*Magnifera*

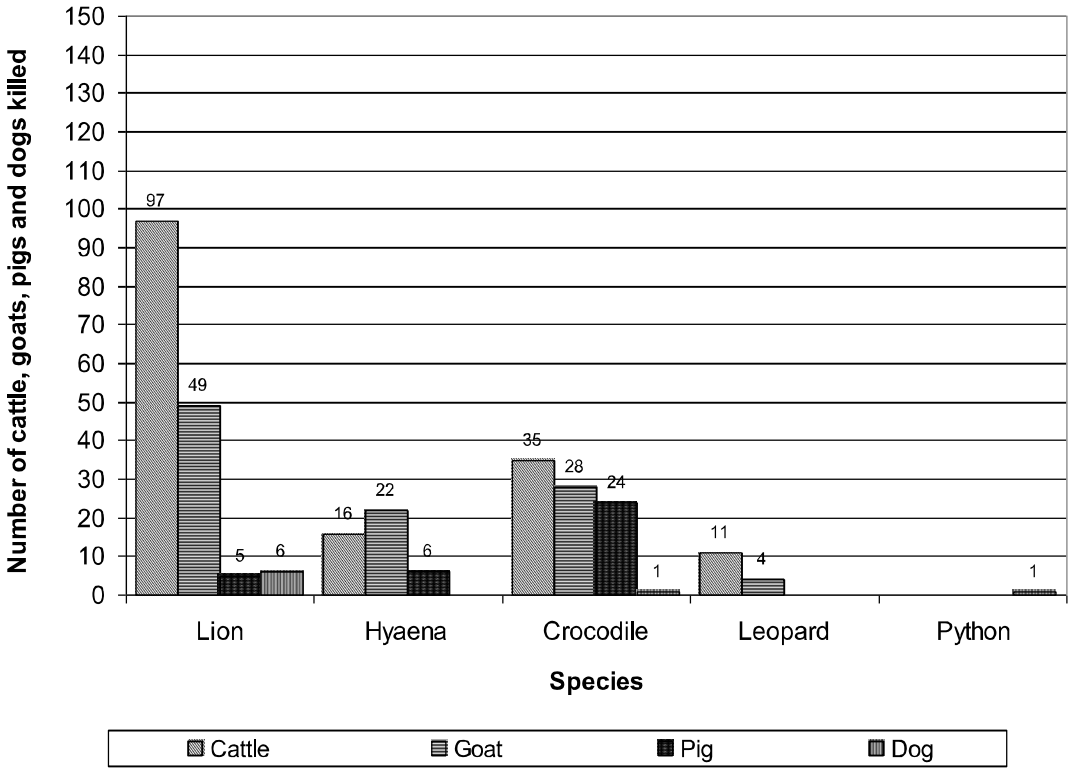


Figure 2. Livestock predation incidences, 2004 – 2010, Zambia.

indica), banana (*Musa* spp) and cassava. The species of animals reported to cause damage to crops were; baboon, elephant, buffalo, hippo, bush pig, monkey, kudu (*Tragelaphus strepsiceros*), eland (*Taurotragus oryx*), zebra (*Equus* spp) roan antelope (*Hippotragus equinus*) sitatunga (*Tragelaphus spekei*) and common duiker (*Sylvicapra grimmia*). Of the total number (4,270) of reports received 1,799 (42%) were attributed to elephant which was reported to eat all crop varieties except cassava and cotton. Hippo was in the second position 1,048 (26%), bush pig 510 (12%), buffalo 449 (11%) and the rest were insignificant (P>0.025). Other species such as kudu were reported to eat only cotton among all the crop varieties recorded.

Damage to human property

During the period 2004 to 2008; fences, granaries and houses were damaged by the elephant. No other species were recorded to cause damage to human physical property. A total of 16 incidences were recorded. Of these 7(44%) were granaries, 5 (31%) of which were houses and 4 (25%) were fences. Of the 7 granaries destroyed, 4 (57%) were in Central Region at Chiawa, Siavonga, Livingstone and Chipepo. Two were in the Northern Region at Munyamadzi and Mpelembe and 1 in Eastern Region in South Luangwa Area Management Unit, while none was recorded in the Western Region. The 5 houses destroyed were distributed as follows; 3 (60%) in Central Region, 1 (20%) each in Northern and Eastern Regions. Western Region did not record any incidence. Of the 4 fences damaged 2 (50%) were in Central Region and 1 (25%) each in Eastern and Northern Regions while Western Region did not record any incidence.

Management responses

During the period of 2002 to 2010, no animal translocation programmes were conducted to mitigate human–wildlife conflicts. Problem animal control by shooting to kill was the method used to respond to incidences of human-wildlife conflicts, particularly, human fatalities and predation on livestock. Many crop damage reports were unverifiable and were in many instances ignored by management, thus no action was taken in some instances.

Comparisons between the number of people killed and the number of animals killed in retribution, showed that there were more animals killed per incidence of human fatality except for lion (Figure 3). Species such as elephant and hippo which are not carnivores and hence

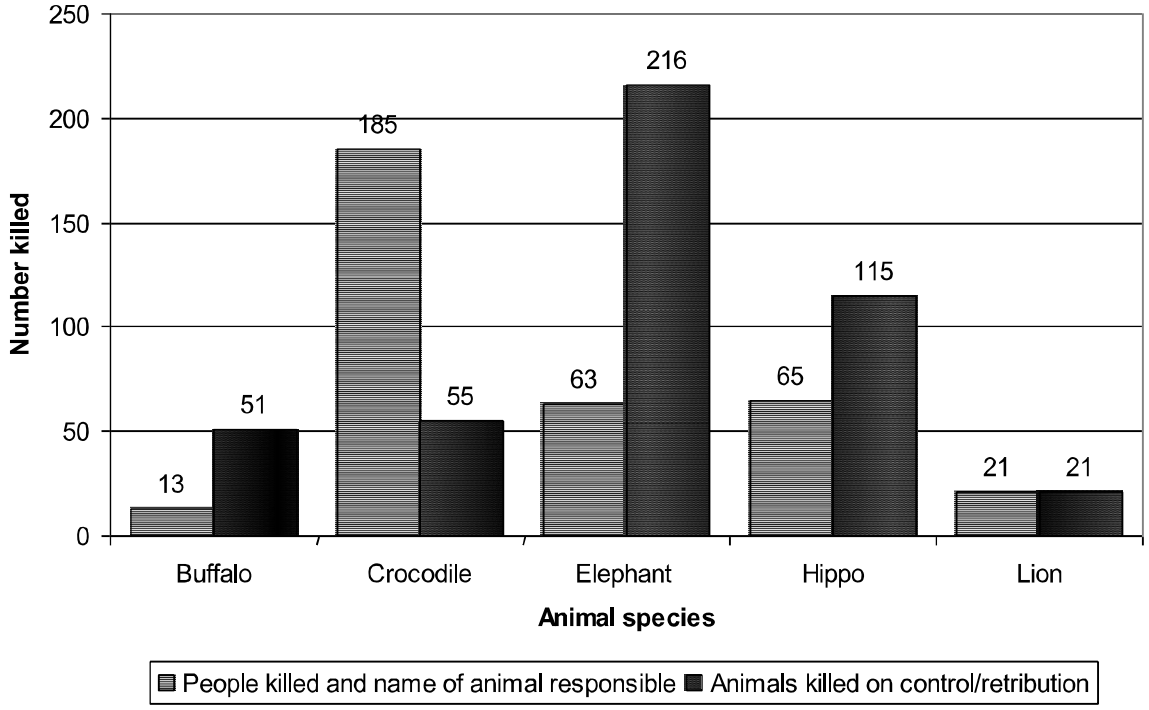


Figure 3. Comparisons of people killed by each species and the number of each species killed in retribution, 2002-2008, Zambia.

do not prey on livestock, were killed in numbers not proportional to the number of human fatalities they caused. For instance, elephant killed 63 people, and in retribution 206 elephants were killed, which was 320% higher than the number of human fatalities it caused. Hippo killed 65 people and 106 hippos were killed on control which was 170% higher than the incidences of human fatalities (Figure 3). This implied that more than one elephant or hippo was killed per incidence.

A combination of both human fatalities and predation showed that some animal species were still killed in numbers greater than the combined human fatalities and livestock predation incidences they caused. For instance, python killed only one dog but 3 pythons were killed in retribution which was 300% higher than the single predation incidence it caused. Buffalo killed 13 people and yet 51 were killed in retribution which was 390% higher than the fatality incidences it caused.

Comparison of management responses between regions

There were significant variations (χ^2, $P<0.05$) in management responses to human wildlife conflicts between regions. Some regions killed more animals on retribution than others. For instance, Central Region which recorded only 69 (20%) human fatalities killed 194 (38%) animals on control for the period 2002 to 2008. Western region which recorded the highest incidences of human fatalities 140 (40%) killed only 40 (8%) (Figure 4).

Pattern of human – wildlife conflicts between species and years

Regarding the pattern of incidences of human fatalities between species and years, no defined pattern or trend was established (Figure 5). The years 2002, 2003, 2009 and 2010 had the lowest incidences (χ^2, $P< 0.05$), while 2006 had the highest number of fatalities 88 (27%) (χ^2, $P< 0.05$). The years 2004, 2007 and 2008 were not significantly different ($P> 0.025$). Among the species, Nile crocodile was the leading cause of conflicts in 2002, 2004, 2006, 2009 and 2010 (χ^2, $P< 0.05$). Elephant marginally recorded higher incidences of human fatalities than crocodile in 2008 (Figure 5). Overall, crocodile was the most significant cause of human-wildlife conflicts (Figure 5).

DISCUSSION

Reporting cases of human – wildlife conflicts

There was suspected over reporting of human – wildlife conflicts for elephant, hippo and buffalo which yield a lot of meat when killed. This could be one of the major

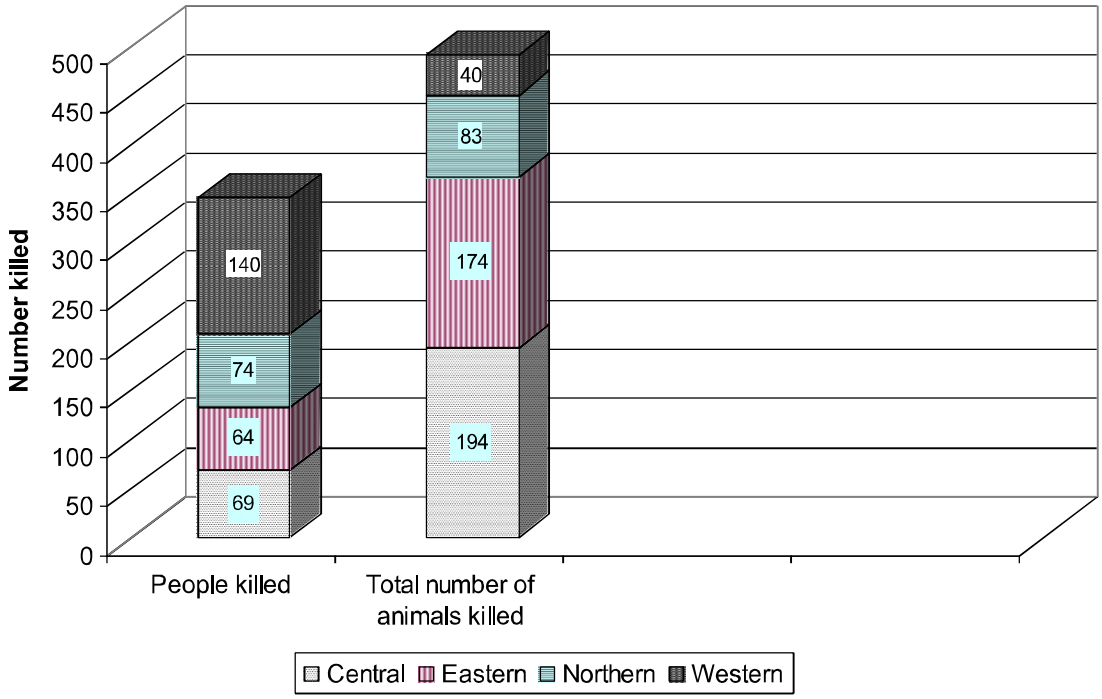


Figure 4. Comparison of people killed and total number of animals killed in retribution per region, 2002-2010, Zambia.

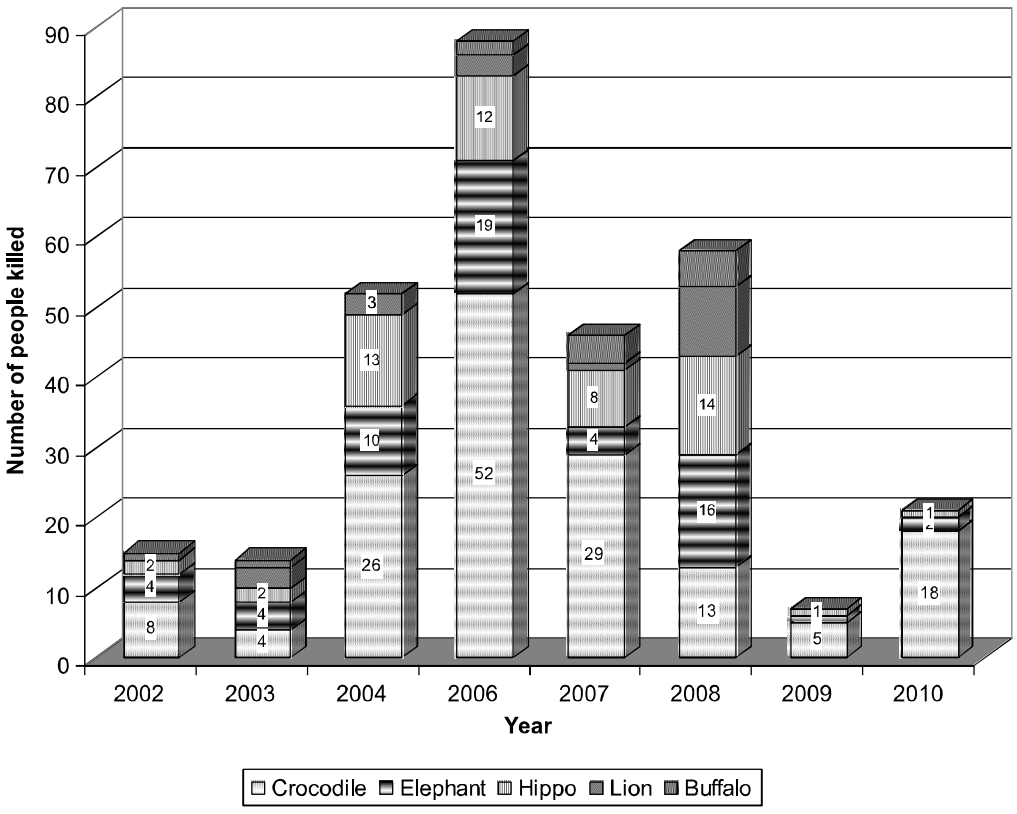


Figure 5. The pattern of human – wildlife conflicts during the period 2002- 2008, Zambia.

reasons why elephant, hippo and buffalo were killed in numbers not proportional to fatality incidences caused. One would expect baboons and monkeys to top the list of human wildlife conflicts although they do not cause human death.

If the number of animals killed on control as retribution were equivalent to the number of human fatalities and livestock predation incidences caused which are easier to enumerate and morally and emotionally justifiable, then there would have been more crocodiles killed than any other species. This is because crocodile caused the most (40%) of human fatalities and livestock predation incidences combined. However, it is assumed that since crocodile meat is not eaten by most communities in Zambia and the export of crocodile skins requires a CITES permit, there would be no incentive for communities to pressurize ZAWA to kill more animals *per* incidence. For crocodile and other animals which are not edible, there would be no direct benefit from such killing other than for emotional reasons to relieve stress arising from loss of human life or livestock. The drive to kill more individuals *per* incidence was clearly established for buffalo, hippo and elephant which yield a lot of meat. In such incidences, killing would both relieve stress and provide meat for the community.

Deciding when to kill an animal after causing damage does not seem to be systematic or based on any guidelines/protocol and there were significant variations between regions. It would appear that, it was much easier to determine that an animal should be killed in retribution when human fatality and/or predation on livestock were involved. This is because each human life lost or livestock predation incidence caused was considered to be a unit of measure for which an animal had to be killed. For crops however, there was no measurable criteria on how extensive the damage caused should be before a decision could be made to kill what species and what number for each incidence. This may have been one of the reasons for the significant differences in the number of animals killed on retribution between regions (Figure 4). In cases where, a family of elephants was involved in causing crop damage, one would need to decide whether to kill the whole herd or the matriarch alone. Here, matters of subjectivity supersede morality and good sense of judgment. In such instances, it was presumably the emotional attributes that determined whether an animal would be killed or not and how many of each species should be killed. It is clear however, based on the data collected during this study, that a field that has been invaded by both baboons and elephants even if the baboons may have caused more damage would instead have elephant exacted in recompense for baboon damage.

While human life is invaluable compared with that of a wild animal, it is clear from this study that all management responses used by ZAWA between 2002-2010 to address human – wildlife conflicts were largely based on pacifying the affected communities and to relieve human emotional pain and stress related to loss of human life and in some instances livestock predation.

The use of PAC was perhaps done to maintain cordial relationships with communities on which the success and sustenance of the Community Based Natural Resources Management (CBNRM) programmes depend. Under such circumstances, ZAWA was left with no option but to use the shoot to kill method. The need to maintain cordial relations with local communities coupled with political pressure and mismanagement of news on human – wildlife conflicts by the public electronic and print media which often attract the attention of politicians are perhaps the most important reasons that compel ZAWA to control animals by shooting in most instances.

In the absence of clear guidelines or Animal Control Protocol frame-work as is the case at the moment, use of shooting to kill will continue to be the most politically sound method of responding to human – wildlife conflicts. In the long term, it would be important to build social capacity in the local community as demonstrated by Nyirenda and Chansa (2011) as a way of improving the handling of human – wildlife conflicts.

Major species of concern in the human- wildlife conflict incidences

Crocodile, elephant, hippo, lion and baboons were the main culprits. However, smaller animals which may cause even more extensive damage particularly to crops such as *Quelea quelea* rodents and insects particularly locust which can devastate large tracts of crops and cause massive starvation, seem to have been marginalized by local communities. Future studies should cover these smaller species rather than concentrating on large species which have meat value.

Location of human – wildlife conflicts

Human-wildlife conflicts were more severe and frequent in Game Management Areas (GMAs) mainly as a result of human encroachment. Expansion of human population from about 4 million at independence to 13 million in 2011 has led to expansion of transport routes and agricultural production to feed the urban and rural populations and in the process taking away what were previously wild lands. The previously uninhabited areas have been opened up to human settlements and agriculture. Some of these settlements are on known animal movement routes and corridors. Others are along rivers and lagoons which are also habitats for hippopotamus and crocodile.

Increased poaching for wild meat to feed mainly the urban populations has also contributed to the reduction of prey species for wild predators. The same occurred in

many of the country's water bodies where over fishing and use of illegal methods of fishing contributed to depletion of fish stocks leaving crocodile to compete with fishers on limited fish stocks. This decline in populations of prey species as reported in the 2008 survey report (Simukonda, 2008) for large predators such as lion and leopard may have accentuated the current high levels of wild cats preying on humans and domesticated animals such as cattle, goats, pigs and dogs as recorded in this study. The increased and progressive loss of natural habitats and biodiversity have probably exacerbated human – wildlife conflicts and may continue in future as communities continue to ignore the need to comply with the provisions of General Management Plans (GMPs) in regulating human settlements in GMAs. Compliance with GMPs would to some extent alleviate human encroachment and minimize human-wildlife conflicts.

Damage to human property

Unlike other species, elephants have capacity to break into peoples' houses, damage fences and granaries. Local communities get more impelled to react in their presence than they would normally do with other species. In the Luangwa Valley for instance, they are reported to break into people's homes to drink locally brewed beer which appear to smell like fermenting fruits of amarula (*Sclerocarya caffra*) which they are fond of and which causes them to behave drunkenly when the fruits ferment in their stomachs (Storrs, 1995). Such aroma from locally brewed beer seemingly attracts elephants which then break into peoples' homes to drink beer brewed from sorghum and finger or Koracane millet (*Eleusine coracana*). In one incidence in 2008, an elephant and its calf broke into a house and drunk locally brewed beer. The drunken mother elephant left behind its calf which was also drunk and was only resuscitated by administering a drip of distilled water by a wildlife veterinary officer (James Milanzi personal communication). In drought prone areas such as the Zambezi and Luangwa Valleys, elephant behaviour of breaking into storage bins negatively impacts on food security. This exacerbates negative attitudes of local communities and politicians towards wildlife and elephant in particular. When political pressure is exerted on the Zambia Wildlife Authority, control of elephants by shooting as a way of pacifying local communities rather than providing a sustainable solution becomes the rule rather than the norm. This could be, perhaps the reason why 206 elephants were killed when they in actual fact only killed 63 people (Figure 3).

Human - crocodile conflicts

In this study, crocodile attacks constituted the largest number of human fatalities. This signifies the Nile crocodile's reputation as a killer of beast and human on the African continent. In Zambia, this fact could be attributed to the wide distribution of the species in almost all rivers, streams, swamps, lagoons, dams, lakes and floodplains where thousands of people in Zambia work and play daily. In most of these water bodies, the means of transport is usually by canoe, raft or small boat poled through narrow papyrus or reed-lined channels or by foot, wading across water inhabited by crocodiles. The main source of livelihood for many local communities living near water is fishing, which compels many family members to work in water daily. Ignorance of the crocodile's habits, its methods of hunting and some of the basic precautions that could be observed in areas where crocodiles occur have resulted in many needless human fatalities in Zambia. The ignorance on the general behaviour of crocodiles coupled with the inability to detect crocodiles in water compared to, for instance, elephants on land which can easily be detected by their large size, noise or droppings aggravate the conflicts. Crocodiles can in fact live very close to humans without being detected. This factor together with the inability to detect crocodiles by people may be responsible for high incidences of crocodile attacks on humans and livestock. Many crocodile attacks may additionally go unnoticed and unreported, since at times, humans or livestock may be stealthily taken when a person is alone or livestock is not accompanied by a person. Such cases go unreported. In remote villages, particularly fishing camps, many deaths are not registered as they find no need to do so. In some areas, many human-crocodile attacks are attributed to witch craft and such incidences are not attributed to the crocodile as a species but to suspected wizards and witches in the village.

Human - hippopotamus conflicts

Hippos usually cause damage to crops at night as they graze on their traditional pasture areas within 10 km of river banks. Crops at risk are those grown in fields close to or within 10 km of the water bodies inhabited by hippos, particularly maize, rice and various types of vegetables and cereal crops. In the Zambezi and Luangwa Valleys, people living near the river often plant their crops on the river bed when the water levels have subsided to take advantage of the subsurface moisture. Such fields are very vulnerable to hippo attack since they are the first food source hippos encounter when they come out of water. Sometimes hippos cause damage to fishing gear resulting in the loss of property earned at a great cost to the artisanal fishermen. In other instances, when the response from the Zambia Wildlife Authority delays, fishermen use homemade and often crude weapons to try to kill hippos as a control measure which often result in injury or loss of human life. It can therefore,

be said that loss of human life or injury usually occurs when people use canoes or small boats as a means of transport or during fishing. In such encounters with hippo, particularly those with calves, it may result into injury or loss of human life.

Human - lion conflicts

In this study, lion was responsible for most livestock predation. A total of 159 herds of cattle were lost over a period of 7 years which would be translated into a loss of US$95,400 at US$ 600 per herd for the farmer. In a country where there is no compensation scheme, the loss of such revenue means a lot and puts a great difference between economic independence and poverty. Patterson et al. (2004) also analyzed the 312 attacks on livestock which claimed 433 heads of livestock over a four year period on two neighbouring arid land ranches adjoining Tsavo East National Park in Kenya. Lions were responsible for 86% of the attacks and the rest were carried out by hyaena and cheetah. Lion and hyaena attacked cattle at night while the cheetah was responsible for sheep and goats. Lamarque et al. (2009) further reported a loss of 241 livestock between 1993 to 1996 in Gokwe, which is adjacent to Sengwa Wildlife Research area in Zimbabwe. Species responsible were baboon, lion and leopard. Baboons took goats and sheep during the day time while leopards and lions took larger livestock, mainly cattle and donkeys at night. With the increase of human encroachment and cattle keeping practices in GMAS, human – lion conflicts may remain as one of the major areas of human-wildlife conflicts.

The human factor

In Zambia like many other African countries, the post independence era led to expansion of the agricultural sector which transformed wild lands and other ecosystems into agrarian areas and urban settlements. The increasing demand for land, food, energy and raw materials for local industries and for export ultimately displaced wildlife from its former range. As more land continues to be converted to agrarian areas, more marginal areas are also taken up leading to encroachment into wildlife habitats. In the Luangwa Valley for instance, human settlements have almost covered the entire Luangwa river length and its tributaries outside National Parks. Such settlement patterns prevent access to these water bodies by wildlife which further heightens conflicts between humans and wildlife as wild animals need water for their survival. Since the Luangwa River is the only reliable source of water in the dry season, such conflicts are likely to increase as human settlements expand in future. Increased human settlements along main rivers and lakes coupled with illegal fishing methods and non observance of the closed fishing season has led to depletion of fish stocks in many water bodies. In such instances, crocodiles are made to compete with humans for limited fish stocks and in the process of such interactions humans are injured or killed by crocodiles. Bryant (2005), for instance, recorded an increase in water side human settlements of 3% per annum in the 1990s along the lake shore of Lake Kariba, Zimbabwe. Subsequently, more people were exposed to the risk of attacks by crocodiles as the number of residents drawing water directly from the lake and the numbers of people informally engaged in subsistence and commercial fishing in the area increased. Fishing is also seen as one of the quickest ways of earning income, and as unemployment soars due to the government's inability to create more jobs, more people are likely to engage in the informal fishing sector. The habitat for hippos and crocodiles will continue to be constrained which increased encounters between humans and the crocodiles and hippos (Bourdillon et al., 1985).

The negative public media reporting further exacerbate the negative perception towards wildlife by the public. While the political decision makers always pronounce the importance of tourism in the economy of the country, little if any is put into the conservation of wildlife. The general public and the media continue to portray many species of wildlife as a people's enemy which should be eliminated to enable communities live incident free lives. Such perceptions erode local support and tolerance for wildlife particularly in communities living in GMAs, along water bodies or close to National Parks. Perhaps this could be the reason why communities demand to have the animals killed when ever there is a report of crop damage even in instances where the extent of crop damage is negligible or sometimes, the animal simply walked through the field. Biased media reporting crystallizes hatred for wildlife by local communities. For instance, there is ingrained hostility to crocodiles by communities living along the Lake Kariba shore line because of the persistent and selective reporting of human-crocodile fatalities and showing of mauled victims on the national television. No effort is made by media personnel to collect and disseminate information to the people on how they should avoid attacks. Because of biased media reporting, a call for total eradication for the man eaters becomes the norm until other serious national incidences take place which then overshadows the crocodile issues. The same applies to elephant, lion and hippo. In all human-wildlife conflicts, wildlife is considered to be an intruder even when humans encroached on their habitats.

Other human-wildlife conflicts

Baboons in addition to crop damage also inconvenienced visitors to protected areas by grabbing food from unsuspecting tourists and at other times picking food

from visitors' vehicles that have not been properly secured. There are some instances where baboons have caused injury to humans and one death associated with baboons was reported in Mosioa Tunya National Park. The visitor was running away from a baboon attack which wanted to grab a hand bag and subsequently fell off the cliff of the Zambezi River and drowned. There is no record of direct killing of a human being by baboon in Zambia although, this has been reported else where.

Management responses

Zambia has no Problem Animal Control Protocol (PACP) and does not have a compensation scheme. There are no resources to sustain a compensation scheme if it was introduced. There are however, instances when ZAWA meets some funeral cost when a human being has been killed by a wild animal, but is done as a matter of empathy rather than obligation. In countries where compensation schemes have been tried, records showed that they have to a larger extent failed because of bureaucracy, corruption, cheating, fraudulent claims, enormous costs in terms of time and money in processing such claims, moral hazards and practical barriers that the less literate or illiterate victims require to overcome the submission of a compensation claim. Compensation schemes are also difficult to manage requiring reliable and highly mobile personnel to verify and objectively quantify damage caused over vast and often far apart areas (Muruthi, 2005; Lamarque et al., 2009). Encouraging compensation schemes would also trigger agriculture expansion which takes away the wildlife habitat. Paying farmers for loss of crops would be equivalent to a subsidy and may result in intensification of agriculture and expansion of settlements in wildlife habitats. Additionally, it is assumed that farmers may not take measures to protect their fields as they know that any damage paid would be paid for in full irrespective of the nature and stage of growth of crops destroyed. Despite the foregoing, in which the implementation of a compensation has been shown to have many challenges, we instead propose that instead of establishing a compensation scheme, the Zambian Government should develop a sustainable incentive scheme, to be named Human-Wildlife Conflict Mitigation Fund, which would be used to alleviate the human-trauma and pain caused by wildlife. For instance, when a person is killed by a wild animal, basic funeral costs such as purchase of a coffin, food and few other logistical support would be provided through this fund which would somehow relieve pain to the bereaved family. In Zambia, this unit would perhaps be managed under the office of the Vice President Disaster Management Unit. Since the disaster unit already exists, perhaps what would be required would be to revise the Terms of Reference to cover Human-Wildlife Conflict mitigation and would be required to work closely with the Zambia Wildlife Authority. In areas such as Siavonga and the Luangwa Valley, where elephants cause damage to grain stores, the Human-Wildlife Conflict Mitigation Fund, can be used to procure metal containers for storing grain as these cannot be damaged by elephant and last a long time, implying that the problem of loss of crop in storage would be solved and the demand by the public to have elephants killed would be minimized or eliminated.

We also suggest that the veterinary unit of the Zambia Wildlife Authority be capacitated to carry out relocation programmes of problem animals where this is possible. This would perhaps minimize the number of animals killed on retribution. Zambia Wildlife Authority should also develop a comprehensive Problem Animal Control Protocol, which would guide staff in the field on the appropriate action to take when a conflict occur, particularly those involving human injury or death.

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